

C A N A D I A N J O U R N A L O F  
**INFECTIOUS DISEASES &  
MEDICAL MICROBIOLOGY**  
JOURNAL CANADIEN DES MALADIES INFECTIEUSES  
ET DE LA MICROBIOLOGIE MEDICALE

**MARCH/APRIL 2015 • VOLUME 26 • SUPPLEMENT B**



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Journal de l'Association pour la microbiologie médicale et l'infectiologie Canada

Journal of the Canadian Association for HIV Research  
Journal de l'Association canadienne de recherche sur le VIH



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**HIV Research**  
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30 avril au 3 mai 2015, Toronto (Ontario)

## **ABSTRACTS / ABRÉGÉS**



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24<sup>th</sup> Annual Canadian Conference on HIV/AIDS Research  
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## ABSTRACTS / ABRÉGÉS

|  |      |
|--|------|
| CAHR Committees / Comités de l'ACRV  | 4B   |
| Message from the CAHR President / Message du président de l'ACRV   | 6B   |
| Message from the Conference Co-Chairs / Message des coprésidents du congrès                                    | 7B   |
| Oral Presentations / Exposés oraux   |      |
| Friday, May 1 / Vendredi 1er mai   | 8B   |
| Saturday, May 2 / Samedi 2 mai   | 25B  |
| Special Session: Community Practice Research /<br>Séance spéciale : Recherche en pratique communautaire        | 42B  |
| Posters / Affiches   |      |
| Track A: Basic Sciences / Volet A : Sciences fondamentales   | 44B  |
| Track B: Clinical Sciences / Volet B : Sciences cliniques  | 59B  |
| Track C: Epidemiology and Public Health Sciences /<br>Volet C : Épidémiologie et sciences de la santé publique | 78B  |
| Track D: Social Sciences / Volet D : Sciences sociales   | 104B |
| Community Practice Research /<br>Recherche en pratique communautaire   | 126B |
| Author Index / Index des auteurs   | 136B |
| <b>Departments</b>   |      |
| Advertisers' Index   | 144B |
| Calendar of Events   | IBC  |

**24<sup>th</sup> ANNUAL CANADIAN CONFERENCE ON HIV/AIDS RESEARCH  
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## MESSAGE FROM THE CAHR PRESIDENT / MESSAGE DU PRÉSIDENT DE L'ACRV

Welcome to the 24<sup>th</sup> Annual Canadian Conference on HIV/AIDS Research (CAHR 2015).

The Canadian Association for HIV Research (CAHR) is proud to be part of the community of researchers and community groups working tirelessly in the global fight against HIV. With a membership of more than 2,000 researchers and others interested in HIV research, CAHR is the leading organization of HIV/AIDS researchers in Canada. The annual CAHR conference is the premier gathering in Canada for those working in the field of HIV, as well as policy makers, persons living with HIV and other individuals committed to ending the pandemic. It is a chance to assess where we are, evaluate recent scientific developments, and together chart a course forward.

I congratulate the members of the 2015 Scientific Program Committee for developing such a strong and thematic programme that will present new scientific knowledge and offer many opportunities for structured dialogue on the major issues facing the global response to HIV. A variety of sessions such as abstract-driven presentations, symposia, and plenary sessions will meet the needs of various participants. Other related activities, including ancillary meetings and training workshops, will contribute to an exceptional opportunity for professional development and networking.

CAHR 2015 will be a tremendous opportunity for researchers and community members from coast to coast to share the latest scientific advances in the field, learn from one another's expertise, and develop new ways to treat and prevent HIV. I hope you enjoy the conference, find it to be a worthwhile learning experience, and thank you in advance for your contributions, participation and continued support.



*Dr Robert Hogg*

Bienvenue au 24<sup>e</sup> Congrès annuel canadien de recherche sur le VIH/sida (congrès de l'ACRV 2015).

L'Association canadienne de recherche sur le VIH (ACRV) est fière de travailler avec le milieu des chercheurs et les groupes communautaires qui œuvrent sans relâche à la lutte mondiale contre le VIH. Comptant plus de 2 000 chercheurs et d'autres personnes s'intéressant à la recherche sur le VIH –, l'ACRV un organisme canadien de premier plan se consacrant à la recherche sur le VIH/sida. Le congrès annuel de l'ACRV est

l'événement le plus important au pays s'adressant aux personnes travaillant dans le domaine du VIH, aux décideurs, aux personnes vivant avec le VIH et aux autres personnes déterminées à enrayer la pandémie. Il offre l'occasion de faire le point sur la situation, d'évaluer les récentes percées scientifiques et d'établir conjointement un plan d'action.

Je tiens à féliciter les membres du comité du programme scientifique de 2015, qui ont su créer un riche programme thématique présentant les nouvelles connaissances scientifiques et offrant de nombreuses occasions de dialogue structuré sur les principales difficultés rencontrées dans le cadre de la lutte mondiale contre le VIH. Un large éventail de séances, dont des présentations d'abrévés, des colloques et des séances plénières, est prévu afin de répondre aux différents besoins des participants. Des activités connexes, notamment des réunions auxiliaires et des ateliers de formation, s'avéreront d'excellentes occasions de perfectionnement professionnel et de réseautage.

Le congrès de l'ACRV 2015 permettra aux chercheurs et aux membres des collectivités d'un océan à l'autre d'échanger sur les derniers développements scientifiques dans le domaine du VIH, d'enrichir leurs connaissances au contact des autres participants et d'établir de nouvelles stratégies de traitement et de prévention du VIH. Nous espérons que le congrès vous sera agréable et qu'il s'avérera pour vous une expérience d'apprentissage utile. Nous vous remercions d'avance de votre contribution, de votre participation et de votre appui constant.

*Dr Robert Hogg*

*President / Président*

*Canadian Association for HIV Research (CAHR) / Association canadienne de recherche sur le VIH (ACRV)*



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## MESSAGE FROM THE CONFERENCE CO-CHAIRS

## MESSAGE DES COPRÉSIDENTS DU CONGRÈS

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We are delighted to welcome you to Toronto for the 24th Annual Canadian Conference on HIV/AIDS Research. In recent years, there has been an increasing focus on work across disciplines to understand and fight the HIV epidemic. Added to this are recent data showing the benefits of a combination approach to HIV prevention, analogous to the continuing successes of combination antiretroviral therapy. At CAHR 2015, we will showcase the benefits of combining treatment, prevention, and research across methodologies, research tracks, and disciplines to combat the HIV epidemic. This combined approach can help us to improve our successes in reaching all those living with HIV, and the diverse marginalized populations across Canada and beyond who are at higher risk for HIV.



*Dr Trevor Hart*

This year's program was designed from over 400 abstracts covering diverse disciplines and topics within HIV research. We also have a large number of Special Sessions and Ancillary Events this year. These sessions will discuss HIV vaccine collaborations and outcomes; Hepatitis C and co-infections among women, trans people, and girls; sociocultural and ethical issues in Treatment as Prevention; program science; drug policy; HIV and its transmission in criminal law; needle and exchange programs in Canadian prisons; Casey House, an HIV/AIDS care facility in Toronto; HIV and immigration; pre-exposure prophylaxis and more. We are also pleased to introduce a special abstract session on community practices in HIV prevention and care, highlighting the important research contributions of community members and organizations in the response to the epidemic.



*Dr Darrell Tan*

Nous sommes heureux de vous accueillir à Toronto à l'occasion du 24<sup>e</sup> Congrès annuel canadien de recherche sur le VIH/sida. Nous avons constaté ces dernières années une concertation accrue interdisciplinaire afin de comprendre et de contrer l'épidémie de VIH. De plus, les données récentes mettent en évidence les avantages des approches combinées à la prévention du VIH, ce qui nous rappelle les succès non démentis des thérapies antirétrovirales combinées. L'ACRV 2015 fera ressortir les avantages des traitements associés, de la prévention et de la recherche entre méthodologies, des volets de la recherche et des disciplines où l'on lutte contre l'épidémie de VIH. Cette approche combinée peut nous aider à relever le taux de succès en établissant le contact avec toutes les personnes vivant avec le VIH et les diverses populations marginalisées au Canada et ailleurs, qui courent plus de risque de contracter le VIH.

Le programme de cette année s'articule autour de plus de 400 abrégés portant sur nombre de thèmes et de disciplines de la recherche sur le VIH. Vous y trouverez aussi nombre de séances spéciales et d'événements connexes, portant par exemple sur les initiatives de collaboration dans la recherche d'un vaccin contre le VIH et les résultats; l'hépatite C et les co-infections chez les femmes, les personnes trans et les filles; questions déontologiques et socioculturelles dans le traitement à titre préventif; science des programmes; politique sur les drogues; le VIH et sa transmission en droit pénal; programmes d'échange de seringues dans les prisons canadiennes; Casey House, établissement de soins de santé spécialisé sur le VIH/sida à Toronto; le VIH et l'immigration; prophylaxie pré-exposition et plus encore. Nous avons aussi le plaisir d'annoncer qu'il y aura une séance spéciale d'abrégés sur les pratiques communautaires en prévention et traitement du VIH, faisant ressortir l'apport important, en matière de recherche, des membres et organismes de la collectivité en réponse à l'épidémie.

*Dr Trevor Hart and/et Dr Darrell Tan*  
*CAHR 2015 Conference Co-Chairs / Coprésidents du congrès de l'ACRV 2015*

## Basic Sciences: HIV Immunology

## Sciences fondamentales : Immunologie du VIH

### O001

#### CD161-EXPRESSING CD8+ T CELLS ARE ALSO ENRICHED IN IL-17 AND IL-22 PRODUCING CELLS AT THE FEMALE GENITAL TRACT AND ARE SEVERELY REDUCED IN HIV-INFECTED FEMALE SEX WORKERS FROM NAIROBI, KENYA

Boily-Larouche, Geneviève<sup>1</sup>; Lajoie, Julie<sup>1</sup>; Omollo, Kenneth O<sup>2</sup>; Cheruiyot, Julianna<sup>2</sup>; Njoki, Jane<sup>2</sup>; Kimani, Makubo<sup>2</sup>; Oyugi, Julius<sup>2</sup>; Kimani, Joshua<sup>2</sup>; Fowke, Keith R<sup>1,2</sup>  
<sup>1</sup>Winnipeg, MB; <sup>2</sup>Nairobi, Kenya

**BACKGROUND:** The C-type lectin CD161 is expressed by CD4+ and CD8+ T cells sharing conserved transcriptional and functional signature. CD4+ T cells with type-17 profiles derived from CD161+ precursors and CD161-expressing CD8+ T cells share the same differentiation profile and include the unique anti-bacterial CD161+ mucosal-associated invariant T cells (MAIT) expressing invariant TCR Va7.2. During HIV infection, circulating cells harbouring the signature of CD161+ cells are impaired in blood and mucosal compartments. In the female genital tract (FGT), portal of entry for HIV infection, the pattern of CD161 expression on CD4+ and CD8+ subsets and how HIV infection impacts these compartments remain unknown. Here, we explore these questions by characterizing CD161-expressing cells in the FGT of chronically HIV-infected (n=16), HIV-negative newly practising sex work (n=36) and highly HIV-exposed seronegative (HESN) (n=33) female sex workers (FSW) from Nairobi, Kenya.

**RESULTS:** When compared to blood, CD161+CD4+ T cells were enriched in the FGT of HIV-negatives. CD161+CD8+ T cells were also enriched in the FGT of new FSW but not in HESN. Circulating and cervical CD161-expressing cells harboured a more activated profile with tissue-homing properties (CD69, CCR5 and  $\beta$ 7) on both CD4+ and CD8+ subsets. The CD161+ subsets included MAIT. Stimulated CD161+ and CD161+CD8+ cells expressed IL-22 at higher frequency than CD161- cells. Expression of IL-17A and IL-22 was enriched in FGT, but independently of CD161 expression in cervical CD4+ cells. CD161+CD8+ T cells were depleted in HIV-positives compared to new FSW in both blood and cervix, but depletion of CD161+CD8+ subset was only observed in cervix.

**CONCLUSION:** Impairment of the IL-17A/IL-22-enriched CD161+CD8+ and CD161+ subsets was observed for the first time in the FGT of HIV-infected FSW. Also, the absence of cervical enrichment of CD161+CD8+ cells in HESN agrees with a protective reduction of cervical inflammation. In contrast to blood, CD161 expression did not efficiently describe type-17 CD4+ T cells in the FGT. The FGT unique environment may importantly impact T cells plasticity promoting Th17 differentiation independently of CD161 expression.

### O002

#### ASSESSMENT OF T-CELL DISTRIBUTION IN TESTICULAR TISSUE OF ART-TREATED HIV-INFECTED SUBJECTS

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Montreal, QC

**BACKGROUND:** HIV persistence in anatomical reservoirs is a major hurdle in HIV eradication. Testicular tissue represents one of the main viral anatomical reservoirs as it constitutes an immunological privileged tissue. Here, we assessed T-cell distribution in testicular tissue versus blood in ART-treated individuals.

**METHODS:** Testicular tissue and blood samples were collected from ART-treated and virally suppressed HIV-infected (n=6, plasma viral load

<50 copies/mL for at least 6 months prior to surgery) and uninfected men (n=6) who underwent elective orchiectomy for gender reassignment. T-cells were purified using CD3 microbeads from freshly isolated testicular interstitial cell suspensions. T-cell subsets, CCR5 expression, T-cell activation and frequency of regulatory T-cells (Tregs) were assessed using multicolor flow cytometry.

**RESULTS:** Lower proportions of CD4 T-cells were found in testis versus blood, in both HIV- and HIV+ subjects (40.5±8.9% vs. 81±9.5% and 29.2±7.4% vs. 73.2±11.5%; p<0.001). A substantial decrease in naïve and a notable increase in effector-memory T-cell subsets were observed in testis compared to PBMCs in both groups (p<0.001 for all comparisons). Importantly, a remarkable increase was observed in the expression of CCR5 on testicular CD4 and CD8 T-cells when compared to blood (CD4 HIV-: p<0.0001, CD4 HIV+: p=0.003, CD8 HIV-: p=0.015, CD8 HIV+: p=NS). Increased T-cell immune activation (CD38/HLA-DR co-expression) in testis was observed in HIV+ individuals. A higher expression of immunosuppressive CD39+ Tregs was found in testis of both HIV- and HIV+ subjects compared to blood (63.2±26% vs. 37±12%, p=0.007 and 62.9±11.5%, vs. 42.6±10%, p<0.001).

**CONCLUSION:** For the first time, our results indicate an increase in the frequency of effector memory T-cells, CCR5 and CD38/HLA-DR expression on T-cells and higher CD39+ Tregs in testicular tissue when compared to blood. Collectively, these findings demonstrate the potential contribution of distinctive T-cells distribution in testicular tissue as anatomical reservoir for HIV persistence.

### O003

#### IL-7 NEGATIVELY REGULATES THE IL-7R AT THE LEVEL OF TRANSCRIPTION THROUGH INDUCTION OF C-MYB AND AT THE LEVEL OF SURFACE PROTEIN THROUGH INDUCTION OF CIS

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Ottawa, ON

**BACKGROUND:** Interleukin (IL)-7 is an essential non-redundant cytokine for T-cell differentiation, proliferation, survival and function. We previously reported a significant down-regulation of the IL-7 receptor (IL-7R)-alpha-chain (CD127) on CD8 T-cells in HIV+ patients, mediated by soluble HIV Tat protein and IL-7, both of which are elevated during HIV infection. We now characterize the detailed mechanisms by which IL-7 suppresses CD127 transcription and protein expression.

**METHODS:** Primary human CD8 T-cells isolated from healthy volunteers were treated with IL-7 and levels of c-Myb, SOCS1-7 and CIS transcripts and protein were examined by qPCR and Western. The interaction of SOCS proteins with CD127 was examined by co-IP and confocal microscopy. Candidate transcriptional repressors were identified using DNA microarrays, PCR-arrays and knockdowns. Nuclear run-on assays and ChIP were used to measure rates of CD127 transcription.

**RESULTS:** Upon binding IL-7, surface CD127 is rapidly phosphorylated and internalized while activation of the JAK/STAT5 pathway induces production of CIS proteins. CIS binds directly to CD127 and co-localizes with both CD127 and early endosomal marker EEA1. Subsequent proteasomal degradation of CD127 and CIS is dependent on an E3 ligase. IL-7 also suppresses CD127 transcription via JAK/STAT5 signaling which up regulates expression of c-Myb. Using siRNA-mediated knockdowns and ChIP, we identified c-Myb as a repressor of CD127 transcription.

**CONCLUSIONS:** IL-7 is currently being investigated as a potential therapy in HIV+ individuals with poor immunological response to antiretroviral therapy. In order to optimize the use of IL-7 in therapeutic settings, it is crucial to understand how expression of the IL-7 receptor is regulated. We show here that IL-7 suppresses CD127 expression by two mechanisms: transcriptional which is dependent on c-Myb and at the protein level by inducing expression of CIS protein which in turn binds to CD127 in early endosomes and shuttles the receptor complex to the proteasome for degradation.

**O004**

**HIV-1-TRIGGERED RELEASE OF TYPE-I INTERFERON BY PLASMACYTOID DENDRITIC CELLS INDUCES BAFF PRODUCTION IN MONOCYTES**

**Gomez, Alejandro M; Ouellet, Michel; Tremblay, Michel J**  
**Québec, QC**

HIV-1 infection leads to numerous B-cell abnormalities, including hypogammaglobulinemia, non-specific B-cell activation, non-specific class switching, increased cell turn-over, breakage of tolerance, increased immature/transitional B-cells, B-cell malignancies as well as a loss of capacity to generate and maintain memory, all of which contribute to a global impairment of the immune humoral compartment. Several cytokines and soluble factors, which are increased in sera of HIV-1-infected individuals, have been suggested to directly or indirectly contribute to these B-cell dysfunctions and one of these is the B-cell-activating factor (BAFF). We provide evidence that HIV-1 (X4- and R5-tropic) up-regulates BAFF expression and secretion by human monocytes. Moreover, we show that the virus-mediated production of BAFF by monocytes relies on a type-I interferon (IFN) response by a small percentage of plasmacytoid dendritic cells (pDCs) present in the monocyte cultures. HIV-1-induced type-I IFN by pDCs triggers BAFF production in both classical and intermediate monocytes but not in non-classical monocytes, which nonetheless display a very strong basal BAFF production. We demonstrate also that basal BAFF secretion is higher in monocytes obtained from females compared to those from male donors. This study provides a novel mechanistic explanation for the increased BAFF levels observed during HIV-1 infection and highlights the importance of pDC/monocyte crosstalk to drive BAFF secretion.

**O005**

**PROTEASE-MEDIATED MUCOSAL BARRIER DISRUPTION AND AN ACCUMULATION OF HIV TARGET CELLS IS A CHARACTERISTIC OF CERVICOVAGINAL INFLAMMATION: A PROTEOMIC ANALYSIS**

**Arnold, Kelly<sup>1</sup>; Burgener, Adam<sup>2</sup>; Birse, Kenzie<sup>2</sup>; Romas, Laura<sup>2</sup>; Dunphy, Laura<sup>1</sup>; Shahabi, Kamnoosh<sup>3</sup>; Abou, Max<sup>2</sup>; Westmacott, Garrett<sup>2</sup>; McCorrister, Stuart<sup>2</sup>; Kwatampora, Jessie<sup>2</sup>; Nyanga, Billy<sup>4</sup>; Kimani, Joshua<sup>5</sup>; Masson, Lindi<sup>6</sup>; Liebenberg, Lenine<sup>7</sup>; Karim, Salim<sup>4</sup>; Passmore, Jo-Ann<sup>4</sup>; Lauffenburger, Douglas<sup>1</sup>; Kaul, Rupert<sup>3</sup>; McKinnon, Lyle<sup>4</sup>**  
<sup>1</sup>Boston, MA, USA; <sup>2</sup>Winnipeg, MB; <sup>3</sup>Toronto, ON; <sup>4</sup>Durban, South Africa; <sup>5</sup>Nairobi, Kenya; <sup>6</sup>Cape Town, South Africa; <sup>7</sup>New York City, NY, USA

**BACKGROUND:** Increased HIV susceptibility has been associated with inflammatory cytokines at mucosal surfaces, but the underlying mechanisms remain unclear. This is likely a function of the general complexity of immune systems. Here we used a global proteomics approach, coupled to multivariate modeling, to examine the impact of cytokine-associated inflammation upon female genital tract mucosa in order to elucidate processes with potential to enhance HIV transmission.

**METHODS:** Cervicovaginal lavage samples collected from HIV-uninfected Kenyan women were classified as 'inflammation+' (n=28) or 'inflammation-' (n=68) based on the elevation (upper quartile) of at least 3 of 7 inflammatory cytokines (MIP-3 $\alpha$ , RANTES, IL-8, MIP-1 $\beta$ , IL-1 $\beta$ , IL-1 $\alpha$ , and TNF- $\alpha$ ), and analyzed by a combination of tandem mass spectrometry, hierarchical clustering, gene set enrichment analysis (GSEA), and multivariate modeling (Lasso algorithm).

**RESULTS:** Of 455 human proteins measured, 53 were significantly associated with inflammation at a 5% FDR threshold. Hierarchical clustering revealed two distinct branches of upregulated (60%) and downregulated (40%) protein groups. Functional enrichment analysis of upregulated clusters included endopeptidases, cell motility, and actin cytoskeleton factors (p<0.01), several of which critical to leukocyte migration. In contrast endopeptidase inhibitors, epidermal cell differentiation, and cornified envelope (barrier proteins) pathways were downregulated in women with inflammation (p<0.0001). Multivariate analysis identified an optimal signature of 16 proteins that distinguished inflammation with 88% accuracy, including neutrophil-associated proteases, which correlated with IL-1 $\beta$  and MIP-3 $\alpha$  levels (p<0.0001). Furthermore, GSEA implicated activated immune cell signatures (NES: -2.10; p<0.0001). Finally, this

type of inflammation was accompanied by a two-fold higher frequency of endocervical CD4+ T cells (p<0.001).

**CONCLUSION:** This data proposes new hypotheses and potential mechanism of enhanced HIV transmission during cytokine-associated inflammation, which includes protease-mediated disruption of mucosal barrier function and an accumulation of HIV target cells. Further exploration of these processes at mucosal surfaces is needed to understand the role of these factors in HIV infection, and may provide new avenues for HIV prevention technologies.

**O006**

**MOLECULAR SIGNATURES OF IMMUNE ACTIVATION AND EPITHELIAL BARRIER REMODELING ARE ENHANCED DURING THE LUTEAL PHASE OF THE MENSTRUAL CYCLE: IMPLICATIONS FOR HORMONE-ASSOCIATED HIV SUSCEPTIBILITY MECHANISMS**

**Birse, Kenzie<sup>1</sup>; Arnold, Kelly<sup>2</sup>; Novak, Richard<sup>3</sup>; McCorrister, Stuart<sup>1</sup>; Westmacott, Garrett<sup>1</sup>; Ball, Terry B<sup>1</sup>; Lauffenburger, Doug<sup>2</sup>; Burgener, Adam<sup>1</sup>**  
<sup>1</sup>Winnipeg, MB; <sup>2</sup>Cambridge, MA, USA; <sup>3</sup>Chicago, IL, USA

HIV transmission events occur more frequently during the luteal phase of the menstrual cycle based on data from non-human primate models, but the underpinning mechanism is not understood. We hypothesize that the immunological environment generated during the luteal phase may be more conducive to successful HIV infection. We performed a comprehensive proteomic analysis of cervicovaginal secretions to better understand mucosal events occurring in the follicular and luteal phases of the menstrual cycle.

Secretions were collected from 19 STI-uninfected, premenopausal women, and characterized as follicular or luteal phase samples based on days since last menstrual period. Samples were analyzed by tandem-mass spectrometry and data evaluated using hierarchical clustering, pathway and gene set enrichment analysis. Data-driven multivariate modeling was also performed to select a minimal set of proteins that specifically distinguish each phase.

Of the 384 proteins identified, 39 were differentially abundant between phases (p<0.05,  $\geq 2$  fold change). Pathway and biofunctional analysis indicated that cell-cell adhesion proteins and protease inhibitors were reduced, and neutrophil recruitment factors (IL-8 pathway, p=1.99E-5) and proteases involved in leukocyte extravasation (p=6.65E-4) were elevated during the luteal phase. A LASSO/PLSDA multivariate model identified 18 factors able to classify the phases with 100% accuracy (93% CV). Eight of these factors positively associated with the luteal phase including cytoskeletal elements and proteases, known to be involved in cellular infiltration. Lastly, a comparison to experimentally-derived data sets by gene set enrichment analysis indicated CD4+ T cell and neutrophil gene set signatures were significantly enriched in the luteal phase (p<0.05).

This data suggests that multiple events important for HIV transmission are enhanced during the luteal phase, including epithelial barrier remodeling, the activation of HIV target cell recruitment pathways and neutrophil activity. These processes should be examined further as a potential link to better understanding increased susceptibility to HIV infection in young women.



## Clinical Sciences: Clinical Care and Complications

### Sciences cliniques : Soins cliniques et complications

**O007**

#### ASYMPTOMATIC NEUROCOGNITIVE IMPAIRMENT (ANI) IS ASSOCIATED WITH PROGRESSION TO SYMPTOMATIC HIV-ASSOCIATED NEUROCOGNITIVE DISORDERS (HAND) IN PEOPLE WITH HIV: RESULTS FROM THE ONTARIO HIV TREATMENT NETWORK (OHTN) COHORT STUDY

Rourke, Sean B<sup>1</sup>; Gill, John<sup>2</sup>; Rachlis, Anita<sup>1</sup>; Kovacs, Colin<sup>1</sup>; Arbes, Gordon<sup>1</sup>; Brunetta, Jason<sup>1</sup>; Carvalhal, Adriana<sup>1</sup>; Power, Chris<sup>3</sup>; Atkinson, Maggie<sup>1</sup>; Rosenes, Ron<sup>1</sup>; Cysique, Lucette<sup>4</sup>; Marcotte, Thomas<sup>5</sup>; Burchell, Ann N<sup>1</sup>; Bekele, Tsegaye M<sup>1</sup>  
<sup>1</sup>Toronto, ON; <sup>2</sup>Calgary; <sup>3</sup>Edmonton, AB; <sup>4</sup>Sydney, NSW, Australia; <sup>5</sup>San Diego, CA, USA

**BACKGROUND:** A recent study from the US CHARTER Cohort demonstrated that ANI is associated with a 2- to 6-fold increased risk for the development of symptomatic HAND [mild neurocognitive impairment (MND) or HIV-associated dementia (HAD)]. The objective of this study is to replicate and extend these results in a Canadian sample.

**METHODS:** Study sample included 575 adults (82% men, 64% Caucasian, 86% on cART, 73% with undetectable HIV viral load) who were either normal on neuropsychological (NP) testing (NP-Normal; n=299) or had ANI (n=276) at baseline. NP testing was done annually (median follow-up time = 30 months) with brief NP battery that included measures of processing speed, attention/working memory, and learning/memory. Cognitive complaints were assessed with four-item Medical Outcomes Study Cognitive Functioning scale. HAND status was assigned according to established Antinori et al., (2007) criteria. We used proportional hazards regression modelling to estimate risk ratios for progression to symptomatic HAND.

**RESULTS:** Over follow-up period, 99 individuals (39 NP-Normal and 60 with ANI at baseline) showed progression to symptomatic HAND. Participants with ANI had shorter time of progression than those who were NP-Normal at baseline, after adjusting for baseline and time-varying predictors: adjusted hazards ratio of 1.85 (95% confidence interval: 1.12-2.82; p=0.005). Among covariates examined, depression and current smoking were associated with higher risk of progression; whereas undetectable plasma HIV viral load was associated with lower risk of progression to symptomatic HAND. Low nadir CD4 (<200 cells/mm<sup>3</sup>) was not a significant predictor of progression in adjusted analyses although it was associated with higher risk in bivariate analyses.

**CONCLUSIONS:** Asymptomatic Neurocognitive Impairment is associated with almost a two-fold increased risk of progression to symptomatic HAND. Early treatment with cART and addressing medical and mental health comorbidities may delay or lower the risk for the development and progression of symptomatic HAND.

**O008**

#### NO IMPACT OF EARLY INTENSIFIED ANTIRETROVIRAL THERAPY ON GUT IMMUNE RECONSTITUTION

Kim, Connie J<sup>1</sup>; Rousseau, Rodney<sup>1</sup>; Kovacs, Colin<sup>1</sup>; Kandel, Gabor<sup>1</sup>; Huibner, Sanja<sup>1</sup>; Shahabi, Kamnoosh<sup>1</sup>; Chun, Tae Wook<sup>2</sup>; Benko, Erika<sup>1</sup>; Ostrowski, Mario<sup>1</sup>; Kaul, Rupert<sup>1</sup>  
<sup>1</sup>Toronto, ON; <sup>2</sup>Bethesda, MD, USA

HIV infection is characterized by reduced mucosal Th22 and Th17 cell numbers and function, which contribute to microbial translocation and inflammation. Standard antiretroviral therapy (ART) is slow to reverse these mucosal defects, and the resulting persistent inflammation is linked to serious non-AIDS illnesses (SNAs). We examined whether ART intensification with maraviroc and raltegravir during early HIV infection

would accelerate the resolution of gut immune dysfunction, microbial translocation, and SNA biomarkers.

ART-naïve men with early HIV infection were randomized in a double-blind manner to receive standard ART (emtricitabine/tenofovir + lopinavir/ritonavir) with either raltegravir and maraviroc, or placebo, for 48 weeks [NCT01154673]. In a predefined substudy, paired blood and sigmoid biopsies were collected from participants at baseline and week 48, and from HIV-uninfected controls. Mucosal CD4 T cell immunology (Th1, Th17 and Th22 cells), and blood markers of microbial translocation (LPS), immune activation (sCD14) and SNA (IL-6 and D-dimer) were assessed. Twenty-two participants documented to have acquired HIV a median of 4 months ago were enrolled. Prior to ART initiation, gut Th22 cell numbers and Th17 polyfunctionality were reduced compared to controls, and plasma LPS and D-dimer levels were elevated. At 48 weeks after ART initiation, overall gut Th22 cell numbers were restored, but plasma LPS levels and gut Th17 function were unchanged, and blood D-dimer levels had actually increased. ART intensification had no impact on gut CD4 T cell immune subsets (Th1, Th17 and Th22 cells), microbial translocation (LPS), or SNA biomarkers (D-dimer and IL-6); there was a trend to reduced plasma sCD14 in the intensified arm.

Early HIV infection was associated with substantial gut mucosal immune dysfunction, bacterial translocation and systemic inflammation. Regardless of intensification with raltegravir and maraviroc, one year of ART had a limited impact on mucosal immune reconstitution or blood markers of microbial translocation, inflammation, and SNAs.

**O009**

#### SOLUBLE ST2 AS A NEW MARKER OF GUT MUCOSAL INTEGRITY AND INFLAMMATION: RELEVANCE FOR HIV INFECTION

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<sup>1</sup>Montreal, QC; <sup>2</sup>Groningen, Netherlands

**INTRODUCTION:** Suppressor of tumorigenicity 2 (ST2), a member of the IL-1 receptor family, can be soluble or membrane-bound. The soluble form of ST2 (sST2) binds IL-33 as a decoy receptor to negate its effects and has been recently validated as a marker of intestinal inflammatory diseases and GVHD/transplant-related mortality. The importance of sST2 in HIV infection, characterized by gut mucosal damage, remains unknown. Here, we assessed sST2 plasma levels in comparison with validated markers of gut mucosal integrity, microbial translocation, and T-cell activation in patients with different clinical outcomes.

**METHODS:** Longitudinal plasma and PBMCs were collected from 41 untreated patients during primary HIV infection (PHI, <180 days) and 1 year later when 24 remained untreated while 17 initiated ART, as well as elite controllers (EC, n=12) and healthy subjects (HS, n=12). Markers of gut mucosal damage (I-FABP) and microbial translocation (LPS) were measured in addition to sST2. Immune activation was assessed in plasma by Tryptophan (Trp) and its catabolite Kynurenine (Kyn) and in PBMCs by HLA-DR/CD38 co-expression on CD4 and CD8 T-cells by FACS.

**RESULTS:** Following PHI, sST2 was elevated compared to HS but did not normalize with early ART. This contrasts with T-cell activation and tryptophan metabolism (Kyn and Kyn/Trp ratio) normalization post-treatment. However, gut markers of integrity (I-FABP) and microbial translocation (LPS) remained elevated echoing the trend seen in sST2. Furthermore, sST2 was associated with tryptophan metabolism only during PHI (Kyn/Trp ratio: p=0.045, Kyn: p=0.039). Notably, sST2 was equally elevated in EC when compared to PHI.

**CONCLUSION:** sST2 can now be considered as a link between tissue damage and inflammation, representing a new marker of gut damage as it mirrors I-FABP and LPS during HIV infection. Insights into sST2 biology in the gut mucosa should be further investigated and may lead to therapeutic interventions in the sST2/IL-33 axis.

**O010**

**PREVALENCE AND AWARENESS OF CARDIOVASCULAR DISEASE RISK FACTORS IN HIV-INFECTED PATIENTS**

**Hughes, Christine A; Koshman, Sheri; Sahajpal, Rahul**  
Edmonton, AB

**OBJECTIVES:** To determine prevalence and awareness of cardiovascular disease (CVD) risk factors and potential barriers to reducing CVD risk in HIV-infected patients.

**METHODS:** Patients  $\geq 40$  years of age and engaged in HIV care for  $\geq 6$  months were approached at their clinic appointment to participate in a telephone survey. Patients were excluded if they did not speak English or did not have a phone. Survey questions were based on the Canadian Heart Health Survey. Demographic and medical information were collected from the patient's chart. Outcomes evaluated were prevalence and knowledge of CVD risk factors, as well as barriers to reducing CVD risk. "Poor" CVD risk factor awareness was defined as the ability to identify  $< 3$  risk factors.

**RESULTS:** Sixty-four patients completed the survey. The majority (73%) were male. Mean age was 52 years (standard deviation 7.7) and 50% had less than secondary school education. Using the Framingham risk score (FRS), 27% were considered high risk ( $> 20\%$  risk of a vascular event in 10 years). Smoking (58%), hypertension (23%) and dyslipidemia (22%) were the most common CVD risk factors. Patients less commonly named CVD risk factors such as dyslipidemia and hypertension, as compared to smoking and poor diet. Overall, the mean number of CVD risk factors identified by participants was 2.2. Participants who smoked were more aware smoking was a risk factor whereas participants with hypertension or dyslipidemia were less aware of their CVD risk. The most common reported barriers to reducing CVD risk were lack of motivation (31%), chronic disease or physical disability (17%), and lack of energy (14%).

**CONCLUSIONS:** Overall, the prevalence of CVD risk factors was high while the awareness of risk factors was low. Consideration of barriers to CVD risk reduction is necessary when planning interventions to reduce CVD risk in this patient population.

**O011**

**TRENDS IN ADMISSIONS TO THE HIV/AIDS WARD AT ST PAUL'S HOSPITAL, VANCOUVER, BRITISH COLUMBIA FROM 2005-2014**

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<sup>1</sup>Vancouver; <sup>2</sup>Burnaby, BC

**BACKGROUND:** Advances in HIV therapies have transformed HIV from a progressive, fatal condition to a manageable chronic disease. Accordingly, trends in reasons for hospital admission among people living with HIV may have shifted over time. This study describes causes of admission to the HIV/AIDS ward at St. Paul's Hospital (SPH).

**METHODS:** This study is a retrospective review of the SPH HIV/AIDS ward database between July 1, 2005–June 30, 2014. Primary discharge diagnoses were manually categorized by related condition and reviewed by two physicians. Data were analysed in twelve-month intervals beginning on July 1. Trends were fitted using generalized estimating equations.

**RESULTS:** 3919 admission for 1595 participants were included in the analysis. 77.0% identified as male, 63.6% had a history of injection drug use and 61.8% were hepatitis C co-infected. Most common reasons for admission included respiratory tract infections (including pneumonia, influenza and upper respiratory infection, but excluding tuberculosis), cellulitis and gastroenteritis, accounting for 18.4%, 6.6% and 6.3% of admissions respectively. The most common opportunistic infections accounted for 6.9% of admissions, including mycobacterial disease (2.6%), *Pneumocystis jirovecii* pneumonia (2.3%), and cryptococcal infection (1.9%). The proportion of admissions attributable to those opportunistic infections declined consistently from 2005-2014 (risk ratio 0.823; 95% confidence interval 0.755-0.897), accounting for 14.6% of admissions in 2005-2006 and 2.6% of admissions in 2013-2014. There were 497 deaths, 322 of which occurred in hospital. 19.3% of deaths were related to HIV-associated infections, 17.3% malignancy-related, 15.3% HIV-related but non-infectious or unspecified and 2.4% related to other infections.

**CONCLUSIONS:** In the era of combination antiretroviral therapy, non-opportunistic respiratory tract infections were the most common cause of admission to the HIV/AIDS ward at SPH. This highlights the need for preventative measures such as pneumococcal and influenza vaccination.

**O012**

**TRENDS IN LATE HIV DIAGNOSIS IN A CLINICAL COHORT OF PERSONS IN HIV CARE (1996–2013): RESULTS FROM THE ONTARIO HIV TREATMENT NETWORK COHORT STUDY (OCS)**

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<sup>1</sup>Toronto; <sup>2</sup>Ottawa; <sup>3</sup>Kingston, ON

**BACKGROUND:** Timely HIV diagnosis is fundamental for optimal linkage to care, and improved health outcomes. Our objective was to quantify trends in late diagnosis as indicators of delays in care engagement.

**METHODS:** We obtained data from medical chart reviews and patient interviews at 10 HIV specialty clinics across Ontario. We defined "late diagnosis" as CD4  $< 350$  Using CD4 cell counts within 12 months of diagnosis or presence of an AIDS-defining condition in the 5 years preceding or 12 months following diagnosis; "very late diagnosis" was defined as CD4  $< 200$  or ADC. We used multivariable logistic regression to identify trends over calendar time and risk factors for very late diagnosis.

**RESULTS:** Among the 3073 participants, the majority were male, reported sex with men as an HIV risk factor, lived in Toronto, and were White. Mean age and CD4 at diagnosis were 36.0 years (SD 10.0) and 227.1 (SD 173.3), respectively, and 15.9% had an ADC. In total, 54.4% had "late" and 35.0% had "very late" diagnosis; this ranged from 58.7% and 39.3% in 1996-99 to 52.6% and 32.6% in 2010-13. In 1996-2005, the proportion with very late diagnosis declined annually (OR=0.94, 95% CI 0.91-0.97); no time trend was observed in 2006-2013 (OR=0.98, 95% CI 0.94-1.01). Independent risk factors for very late diagnosis were older age (OR=1.5, 95% CI 1.4-1.6 per decade), being Indigenous (OR=1.7, 95% CI 1.3-2.2 versus White), being a female (OR=1.6, 95% CI 1.2-1.9) or heterosexual male (OR=1.9, 95% CI 1.6-2.4) versus MSM, being IDU (OR=0.7, 95% CI 0.6-0.9). We observed no independent association with other ethnicities, immigration, or region of Ontario.

**CONCLUSION:** We observed a decline in the proportion with late or very late diagnosis before 2006, and no change thereafter. The cohort likely under-represents those diagnosed very late who may not have survived to volunteer for research. Nevertheless, our results suggest that there is room for improvement to facilitate early diagnoses in Ontario.

**Epidemiology and Public Health:  
Co-infections, Co-morbidities  
and Co-factors**

**Épidémiologie et santé publique :  
Coinfections, comorbidités et cofacteurs**

**O013**

**TRENDS OVER TIME IN HIV & HCV RISKS AMONG PEOPLE WHO INJECT DRUGS IN ONTARIO**

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Toronto, ON

**BACKGROUND:** Between 2003 and 2011, repeated cross-sectional surveys among people who inject drugs (PWID) were conducted in Toronto (4 surveys), Sudbury (4), Kingston (2), and Thunder Bay (2) as part of the I-Track behavioural surveillance system sponsored by the Public Health Agency of Canada (PHAC). This analysis describes trends over time in key variables from these surveys.

**METHODS:** Participants were recruited from needle exchange programs in each city using comparable methods in each survey. Interviewers admin-

istered questionnaires and collected dried blood spot samples using coded linkage to maintain anonymity.

**RESULTS:** Toronto recruitment numbers ranged from 221-262 per survey; Sudbury 147-169; Kingston 200-224; and Thunder Bay 139-149. All cities except Thunder Bay showed an upward trend in proportion of participants self-reporting as aboriginal; Thunder Bay had the highest proportion of aboriginal participants. Toronto showed an upward trend in reports of stable housing, and a downward trend in injecting with used needles/syringes & injecting in public places; other cities showed no significant change. Trends in reported patterns of drugs used varied across cities for both injected and non-injected drugs. Toronto and Sudbury showed significant upward trends in reports of having an HIV test in the previous year; for Thunder Bay this declined. Toronto showed an upward trend in reporting of HCV testing. Kingston & Thunder Bay reported increases in proportions under physician care for HIV, and proportions of those receiving HIV meds. Sudbury was the only city showing a downward trend in reporting of needle exchange access.

**CONCLUSIONS:** Although Ontario has a province-wide program supporting needle exchange provision, these results suggest that specific contexts in different cities may affect key aspects of HIV risk among PWID. Trends must be considered with caution and interpreted using local knowledge, since although recruitment methods are constant, samples are relatively small and may be affected by unrecognized selection and volunteer bias. The lack of downward trend in injecting risk behaviours in most cities suggests consideration of additional strategies such as supervised injection facilities.

#### O014

### A POPULATION-BASED EXAMINATION OF BACTERIAL SEXUALLY TRANSMITTED INFECTIONS TESTING AND HISTORY PRIOR TO HIV DIAGNOSIS AMONG HIV CASES AND HIV-NEGATIVE CONTROLS: THE MISSED OPPORTUNITY FOR DIAGNOSES EPIDEMIOLOGICAL STUDY (MODES)

Shaw, Souradet Y; Becker, Marissa; Ireland, Laurie; Ens, Carla; McClarty, Leigh; Yu, Bo; Keynan, Yoav; Bullard, Jared; Wylie, John L; Van Caesele, Paul; Kasper, Ken  
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**BACKGROUND:** Understanding testing patterns of sexually transmitted infections (STI) and previous STI history of HIV positive individuals, prior to their diagnosis, can inform earlier diagnosis and engagement and prevention strategies.

**METHODS:** This was a population-based, retrospective analysis of prior testing and history of bacterial STIs among HIV-positive individuals presenting to care between 2007-2011 to the Manitoba HIV program (MHP). HIV cases were age-, sex- and region-matched to HIV-negative controls at a 1:5 ratio. Clinical information was linked to testing data from Cadham Provincial Laboratory (CPL) as well as STI databases at Manitoba Health. CPL data were used to calculate rates of chlamydia (CT) and gonorrhea (GC) testing. In Manitoba, CT and GC tests are performed concomitantly, thus testing rates are for CT/GC combined. Person-days prior to entry into MHP care (case date) was used as the denominator in rate calculations. Infection history for CT and GC was derived from Manitoba Health's STI databases. Testing and CT/GC infections incident in the 6-month period prior to case date were not included. Stratified Poisson regression models were used to compare testing rates, while conditional logistic regression was used to compare CT and GC infections between cases and controls. Where appropriate, relative rates (RRs), odds ratios (ORs), and their 95% confidence intervals (95% CI) are reported.

**RESULTS:** A total of 181 cases and 1,129 controls were included. In the 5 years prior to HIV diagnosis, CT/GC testing rates for HIV cases were approximately threefold higher than their HIV-negative controls (RR: 2.9, 95% CI: 2.5-3.4). HIV cases had higher odds of having had CT (OR: 3.1, 95% CI: 1.6-5.9) and GC (OR: 11.8, 95% CI: 4.9-28.5) infections.

**CONCLUSIONS:** HIV cases had higher STI testing rates, as well as being more likely to have had a history of a bacterial STI, suggesting significant gaps and missed opportunities for prevention.

#### O015

### THE CANGO LYEC PROJECT – HEALING THE ELEPHANT”: EXPERIENCES OF HIV, PTSD, AND DEPRESSION AMONG FORMER ABDUCTEES IN POST-CONFLICT NORTHERN UGANDA COMPARED TO THEIR NON-ABDUCTED COUNTERPARTS

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<sup>1</sup>Vancouver, BC; <sup>2</sup>San Francisco, CA, USA; <sup>3</sup>Gulu; <sup>4</sup>Kampala; <sup>5</sup>Amuru, Uganda

**BACKGROUND:** Abduction by the Lords Resistance Army has had a profound impact on the physical and psychosocial well-being of well being of people who have survived the conflict in Northern Uganda. Despite the pervasiveness of the conflict into every level of society, relief and recovery efforts often target perceived 'at-risk' groups and lack a sound evidence base.

**METHODS:** The Cango Lye Project is a prospective cohort study of 2500 participants age 13-49 in three districts of Northern Uganda. Participants consented to participate in the study, completing trauma (HTQ), depression (HSCL-25) sociodemographic surveys, and providing blood samples for HIV testing. Three separate multivariable logistic regression models examined a history of abduction and the likelihood of HIV positivity, PTSD, and Depression.

**RESULTS:** Of 2388 participants in the study, 27.4% of men (n=271) and 22.9% of women (n=319) experienced abduction during the conflict. Abducted women reported higher proportions of HIV risk factors than non-abducted women including lifetime sexual abuse (34.2% vs. 7.15%), participation in sex work (2.2% vs. 0.5%), active syphilis (7.2% vs. 4.4%), and experiencing 12 or more traumatic events (32.9% vs. 1.8%). Among men, abductees were more likely to report inconsistent condom use (6.3% vs. 15.6%), to have experienced 12 or more traumatic events (33.1% vs. 1.84%), and to have abused their current sexual partner (19.6% vs. 8.9%). After adjustment, history of abduction was significantly associated with depression (AOR 1.89; 95% CI 1.43-2.49) and PTSD (AOR 2.10; 95% CI 1.56-2.83), but was not significantly associated with HIV infection (AOR 1.08, 95% CI 0.80-1.47).

**DISCUSSION:** HIV remains a crucial issue and is not confined to easily defined groups in Northern Uganda, requiring a rethinking of treatment and prevention programs. Former abductees face much higher levels of both PTSD and depression. Trauma informed HIV prevention and culturally safe mental health care initiatives are urgently required.

#### O016

### OPTIMIZING ANTENATAL CARE: A 20-YEAR CLINICAL CASE SERIES OF ADVERSE OBSTETRICAL OUTCOMES AMONG WOMEN LIVING WITH HIV IN THE OTTAWA AREA

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**OBJECTIVES:** Despite increased risks associated with socio-structural barriers to care and clinical comorbidities, the prevalence and risk factors associated with adverse obstetrical outcomes among women living with HIV (WLWH) are not well measured. The objectives of this study were: 1) investigate the prevalence and correlates of adverse obstetrical outcomes among WLWH over a 20-year time span and 2) compare it to that of the general obstetrical population in the Ottawa area.

**METHODS:** This 20-year (1990-2010) clinical case series assessed adverse obstetrical outcomes among pregnant WLWH receiving care at The Ottawa Hospital (TOH). General estimating equation (GEE) modeling was used to identify factors most strongly associated with adverse obstetrical outcomes, while controlling for year of childbirth clustering. Control group data were abstracted from the Better Outcomes Registry & Network (BORN) Ontario to compare the prevalence of obstetrical outcomes among WLWH to the general obstetrical population.

**RESULTS:** A total of 145 pregnancies among 94 WLWH were recorded at TOH between 1990-2010 – 17.32% were premature, 7.09% were low birth weight, 9.45% were small for gestational age and 3.14% were still



birth. For each additional year, the odds of adverse obstetrical outcomes increased by 15% (OR 1.15, 95% CI 1.03-1.30). In GEE analyses, psychiatric history (AOR 2.64, 95% CI 1.12-6.24), teen pregnancy (AOR 3.35, 95% CI 1.04-1.46), and recent immigrant status (AOR 7.24, 95% CI 1.30-40.28) were the strongest predictors of adverse obstetrical outcomes. Compared to the general obstetrical population, WLWH had significantly higher odds of premature birth (OR 2.06, 95% CI 1.29-3.21) and stillbirth (OR 6.00, 95% CI 2.13-16.83).

**DISCUSSION:** This study shows an increasing proportion of adverse obstetrical outcomes among pregnant WLWH over the past 20 years, and significantly higher adverse outcomes compared to the general population. It is a public health imperative to ensure WLWH achieve the best possible obstetrical outcomes for optimal maternal and child health.

## O017

### COCAINE USE AND CHRONIC KIDNEY DISEASE IN A HCV-HIV CO-INFECTED COHORT

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**BACKGROUND:** Chronic kidney disease (CKD) screening guidelines have recommended monitoring of estimated glomerular filtration rates (eGFR) for patients on stable ART. We sought to determine the risk of prevalent and incident CKD associated with cocaine injection use, a known nephrotoxin, among HCV-HIV co-infected patients receiving care. **METHODS:** The Canadian Co-infection Cohort is a multicentre, prospective cohort study of 1,321 co-infected patients with visits scheduled every 6 months. Ever and cocaine injection use since the last visit was obtained by self-report. CKD was defined as a confirmed (two measurements  $\geq 3$  months apart) eGFR of  $\leq 70$  mL/min/1.73 m<sup>2</sup> for patients with a baseline eGFR  $> 70$  mL/min/1.73 m<sup>2</sup>. eGFR was calculated using the 2009 serum creatinine-based CKD-EPI equation. Risk ratios (RR) for prevalent CKD were calculated using modified Poisson regression. Hazard ratios (HR) for incident CKD were calculated using a discrete-time proportional hazards model.

**RESULTS:** At baseline, 94 patients (7%) had prevalent CKD and 882 (67%) reported any past cocaine injection exposure. Ever cocaine injection users were younger, more likely to be female and aboriginal, and have been on atazanavir in the past. After adjusting for these covariates, past cocaine injection was associated with prevalent CKD (RR 1.87, 95% CI 1.09–3.21). During follow-up, 407 (39%) of 1,035 patients free of CKD reported using injection cocaine at least once and 122 patients (12%) developed incident CKD. After adjusting for current age, gender, aboriginal ethnicity, current CD4<sup>+</sup> count, hypertension, and tenofovir and protease inhibitor use, recent cocaine injection increased the risk of incident CKD (HR 1.48, 95% CI 0.94–2.31). This effect was largest among those who injected  $\geq 3$  days/week (HR 2.98, 95% CI 1.07–8.03).

**CONCLUSIONS:** Past cocaine injection was associated with prevalent CKD and recent heavy use increased the risk of incident CKD independent of traditional risk factors.

## O018

### LOW INCIDENCE OF REINFECTION WITH HEPATITIS C VIRUS AFTER SUCCESSFUL TREATMENT IN MONTREAL

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**INTRODUCTION:** The incidence rate of HCV infection is estimated at 26/100 py among Montreal IDU. Though HCV reinfection has been reported in IDU and MSM patients, the extent to which it occurs is unknown. Given the high treatment costs, HCV reinfection in cured patients may limit future access to treatment. We therefore aimed to evaluate the incidence of reinfection in a clinical cohort of HCV treated patients.

**METHODS:** HCV patients with a sustained virological response (SVR) were included. Censoring date was the date of HCV reinfection or the date of the last negative HCV RNA test. Reinfection was defined as detectable HCV RNA. The rate of reinfection was calculated using the

number of person-years of observation after the end of treatment (EoT). Time from SVR to reinfection was estimated using Kaplan-Meier analyses. **RESULTS:** 338 patients were included. The sample was 77% male; mean age was 46 years; and the main risk factor for HCV infection was IDU (n=275, 82%). Patients were followed for a median of 2.7 years after EoT (IQR=1.7-4.8), for a total of 1175 person-years. 316 (94%) patients remained HCV-negative, while 22 (6%) became reinfected during follow-up with an overall reinfection rate of 1.7/100py (95% CI 1.07-2.58). Median time to reinfection was 14.7 years (95% CI 13.6-15.7). Cumulative incidence of seroconversion within 2 years of SVR was 4% (9/210) and 11% (10/88) within 5 years. When controlling for drug use, the incidence rate of HCV reinfection was 0.43/100py (95% CI 0.02-0.11) for non-IDU; 1.90/100py (95% CI 1.13-3.14) for past IDU and 3.60/100py (95% CI 1.44-7.39) for present IDU.

**CONCLUSION:** HCV reinfection after successful treatment in our cohort is low. Although the rate of HCV reinfection is higher in IDU than non-IDU, it is much lower than the overall incidence rate of the first HCV infection among IDU in Montreal.

## Social Sciences: The Health of Gay, Bisexual and other Homosexually Active Men

## Sciences sociales : Santé des gais, bisexuels et autres hommes homosexuels actifs

## O019

### RISK-REDUCTION STRATEGIES AMONG MEN WHO HAVE SEX WITH MEN: A LATENT CLASS ANALYSIS OF PARTICIPANTS TESTED FOR HIV AT SPOT, A COMMUNITY-BASED RAPID TESTING INTERVENTION IN MONTREAL

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**BACKGROUND:** In recent years, the HIV prevention strategies used by MSM have become more complex. Participants at SPOT were asked about the risk-reduction strategies they used in the previous 3 months.

**OBJECTIVE:** Identify patterns in the use of risk-reduction strategies and key characteristics of these patterns.

**METHOD:** Cross-sectional data from 360 MSM tested for HIV at SPOT between August 2013 and December 2014 were used to perform a latent class analysis, integrating scales for four risk-reduction strategies: 1) communicating with sexual partners about HIV and STI status; 2) avoiding anal sex without condoms (ASWC); 3) avoiding sex with HIV-positive partners; 4) opting only for very low-risk sexual practices. Univariate comparisons of classes were performed using sociodemographic, behavioral, and sociosexual indicators.

**RESULTS:** Six classes were identified: Class 1: total avoidance of sex with HIV-positive partners and strong propensity to communicate about HIV status (45%); Class 2: little use of any strategy (16%); Class 3: strong propensity to avoid ASWC and little use of other strategies (13%); Class 4: strong propensity to opt for very low-risk practices and high overall use of other strategies (12%). Class 5: strong propensity to avoid HIV-positive partners and little use of other strategies (11%). Class 6: No communication about HIV status and high use of other strategies (3%). Differences among classes were observed for various indicators: attitudes toward prevention, barriers to condom use, recreational drug use, number of partners in the previous 3 months, testing habits, etc.

**CONCLUSION:** These results point to patterns of diversification in prevention strategies, shaped by sexual lifestyle and other characteristics. Serosorting and avoidance of ASWC are predominant, but most participants use a combination of strategies. However, nearly a third have difficulty using an effective strategy. A better understanding of the individual, social, and structural factors that influence these patterns is required.



## O020

### SUBSTANCE USE, SEXUAL BEHAVIOUR, AND SERO-ADAPTIVE STRATEGIES OF VANCOUVER GAY AND BISEXUAL “GROUP SEX EVENT (GSE)” ATTENDEES

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**BACKGROUND:** Analyses of gay/bisexual men's group sex events (GSE) report high levels of poly-substance use and condomless sex. Yet recent studies also note harm reduction practices in these risk environments. We analyzed Vancouver Momentum Health Study data to compare characteristics of men who attended GSE in the past 6 months to those who did not.

**METHODS:** Momentum participants were recruited from February 2012 – February 2014 using respondent-driven sampling (119 seeds, 16 waves); all analyses use RDS weights. Three separate logistic regression models compared GSE attendees (n=180) to non-attendees (n=531) with respect to: 1) substance use patterns, 2) psychosocial characteristics & sexual behaviour and, 3) sero-adaptive strategies. Variables with  $p < 0.05$  from initial univariable models were selected for inclusion in subsequent multivariable models, while the Akaike Information Criterion determined the final models.

**RESULTS:** The first model's results showed that GSE attendees featured significantly higher use of erectile dysfunction drugs (AOR=2.86, 95% CI=1.66–4.92) and poppers (AOR=3.76, 95% CI=2.49–5.70), and were more likely to have >15 drinks/week (AOR=2.39, 95% CI=1.40–4.08). For the second model GSE attendees were significantly more likely to report unprotected anal sex with a sero-discordant or unknown sero-status partner (AOR=2.35, 95% CI=1.52–3.64), fisting (AOR=2.29, 95% CI=1.17–4.49) and sex toy use (AOR=2.49, 95% CI=1.59–3.89), and scored higher on the Sensation Seeking Scale (AOR=1.10, 95% CI=1.04–1.15). In the third model GSE attendees featured differing sero-adaptive strategies for condomless anal sex, as HIV-positive men reported sero-sorting with sero-concordant partners (AOR=3.20, 95% CI=1.37–7.44), while HIV-negative men sought HIV-positive partners on treatment and/or with low viral loads (AOR=4.92, 95% CI=2.49–9.74).

**CONCLUSION:** Despite higher substance use and adventurous sex practices, GSE attendees reported distinctive sexual harm reduction practices. For condomless anal sex, HIV-positive men reported sero-sorting and HIV-negative men favored a Treatment as Prevention strategy by seeking HIV-positive partners on treatment and/or with a lowered viral load. Results have potential for promoting safer GSE participation.

## O021

### OPTIMIZING COMBINATION HIV PREVENTION: DIFFERENTIAL REASONS FOR CONDOM USE AND NON-USE AT LAST ANAL SEX ENCOUNTER AMONG GAY, BISEXUAL, AND OTHER MEN WHO USE THE INTERNET TO SEEK SEX WITH MEN (MISM) IN ONTARIO

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**BACKGROUND:** To optimize combination HIV prevention, we sought to examine how an existing strategy (condom use) was differentially reasoned by MISM in Ontario.

**METHOD:** Data were drawn from the province-wide community-based Cruising Counts study of MISM aged 16+ who completed a 15-minute anonymous online questionnaire. Participants described their last anal sex encounter (event-level factors) and qualitatively described reasons a condom was used or not. Qualitative responses were coded non-exclusively and differences in terms of event-level and individual-level factors (e.g., age in years, sexual identity, race/ethnicity) were determined quantitatively using manual backward stepwise multivariable logistic regression.

**RESULTS:** Among 1,830 participants, 883 (79.8%) reported a recent anal sex event, of whom 60.5% used condoms. Reasons for condom use included protection/safety (82.4%), norm (30.5%), and combination prevention (6.2%). Reasons for non-condom use were grouped non-exclusively as intentional non-use (43.2%), trust (28.1%), unintentional non-use (25.4%), and other risk reduction (20.0%). Event-level substance use was associated with all non-use reasonings: e.g., participants

who used substances were more likely to reason non-use as unintentional (AOR=1.70, 95% CI 1.04-2.78) and partner substance use was negatively associated with trust as the reason for non-use (AOR=0.53, 95% CI 0.31-0.90). Participants were more likely to explain condom non-use with partners met online (versus not) as intentional (AOR=2.43, 95% CI 1.62-3.67) and less likely due to trust (AOR=0.25, 95% CI 0.15-0.40). Younger men were less likely to reason non-use due to other risk reduction practices (AOR=1.03, 95% CI 1.003-1.05) and also less likely to explain condom use as a norm (AOR=1.01, 95% CI 1.001-1.03). Bisexual men and men who didn't self-identify as White were also less likely to explain condom use as a norm (AOR=0.59, 95% CI 0.40-0.87 and AOR=0.62, 95% CI 0.42-0.92, respectively). Participant-partner sero-concordance was an important predictor across all condom use and non-use reasons: e.g., discordant partnerships were more likely to explain condom use as part of combination prevention compared with negative concordant partnerships (AOR=13.40, 95% CI 5.09-35.32).

**CONCLUSION:** MISM described various reasons for using condoms or not. This understanding supports the need for targeted, culturally appropriate health promotion to optimise combination HIV prevention.

## O022

### PROVIDING ONLINE AND MOBILE OUTREACH FOR MSM IN ONTARIO: FINDINGS FROM ONTARIO'S COMMUNITY-BASED CRUISING COUNTS STUDY

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**BACKGROUND:** The Internet has increasingly become the most common tool for gay and bisexual men, and other men who have sex with men (MSM) to find sexual partners. As a result some AIDS Service Organizations (ASOs) provide online outreach on different socio-sexual networking websites and mobile apps. Little is known about the challenges and opportunities this online outreach provides. The aim of this analysis was to investigate the experiences of ASOs and other community-based organizations (CBOs) across Ontario in the planning and implementation of online outreach.

**METHODS:** From November 2013 to January 2014, ASO/CBO online outreach providers and managers (n = 22) were recruited to complete a 1-hour in-person/telephone interview to explore in-depth their experiences with, and perspectives on, delivering online outreach services for MSM in Ontario. Participants were asked to identify the organizational structures, policies, or programs that are supportive of this work and were asked to comment on the capacities, opportunities, barriers, and challenges for providing online outreach. Participants also commented on their evaluation practices and the parameters they used to indicate success. Interviews were digitally recorded and transcribed verbatim. Thematic analyses were conducted using NVivo10.

**RESULTS:** The findings indicate that service providers consider online outreach a vital tool for HIV prevention. Providers highlighted the strengths and advantages (anonymity, engaging hard-to-reach MSM) of online outreach over face-to-face outreach. Across interviews, the following themes were identified as barriers to providing effective online outreach services: staff capacity and training, confidentiality and privacy of online interactions, safety of participants and staff, uncertainty of best practices, and lack of updated HIV prevention tools.

**CONCLUSION:** The findings highlight the barriers to and advantages of providing online outreach for MSM. These findings can inform ASOs/CBOs on how to increase the effectiveness of online outreach to MSM communities.

## O023

### SCENES AS MICRO-CULTURES: USE OF LATENT CLASS ANALYSIS APPROACH TO EXAMINE HETEROGENEITY AMONG GAY, BISEXUAL AND MEN WHO HAVE SEX WITH MEN FREQUENTING MULTIPLE SCENES IN TORONTO, CANADA

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**BACKGROUND:** Micro-cultural contexts, such as party and play (PnP), BDSM, and the leather scene, have received attention as contexts for potential HIV infection among men who have sex with men (MSM). In this analysis, using Latent Class Analysis (LCA) approach, we examined patterns of scene participation and psycho-social factors associated with these patterns.

**METHODS:** Using data from 470 MSM recruited from Toronto, we calculated posterior probability of being in a class from participation in 9 separate scenes. Simultaneously we fit a multinomial regression model to differentiate MSM within each class by personal, psychological and behavioral characteristics. We used Entropy, the Bayesian information criterion and the Lo-Mendel-Rubin likelihood ratio test to identify the best fit model.

**RESULTS:** Fit indices suggested a four class solution. Half (51%) of the MSM reported Minimal participation in any scene; 28% reported higher probability of participating in dance club scene; 14% reported higher probability of participating in BDSM (0.53), Bear (0.46) and in Leather (0.71) scenes and 6% reported higher probability of participating in circuit (0.64), PnP (1.00) and in sex party (0.58) scenes. Compared to Minimal scene participants, BDSM-Leather scene participating MSM were more likely to be older, White, to report higher sexual self-esteem and to engage in condomless sex; Party scene participants were more likely to be men of color and to use drugs before/during sex, whereas MSM participating in Dance Club scene were more like to be younger, and to report lower self-efficacy but higher hope.

**CONCLUSION:** LCA allowed us to identify distinct social-niches/micro-cultures of participating MSM and factors characterizing these micro-cultures. Distinct scene participating MSM differ in their risk for HIV and STIs as their characteristics. Tailored interventions are needed that focus on reducing HIV risk and promoting sexual health in specific sexual contexts such as the BDSM-Leather and Party scenes.

## O024

### HUMAN PAPILLOMAVIRUS VACCINATION FOR GAY AND OTHER MEN WHO HAVE SEX WITH MEN: ADVANCING POLICY AND PRACTICE

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**BACKGROUND:** The quadrivalent human papillomavirus vaccine (HPV4) is 90% effective in preventing HPV-types associated with genital warts, and anal, penile and oral cancers among men. Among gay and other men who have sex with men (MSM), the high prevalence of anal HPV is associated with 44-times (among HIV-positive MSM 60-times) higher incidence of anal cancer than the general population. Yet, 11 of 13 Canadian provinces/territories only include girls in publicly-funded HPV vaccination. We examined rates and correlates of HPV vaccine acceptability, and ramifications of HPV vaccine policy for MSM in Canada.

**METHODS:** We conducted a systematic search across multiple electronic databases to locate empirical studies that examined rates and/or correlates of HPV4 acceptability among men, including MSM. We performed meta-analysis on studies examining similar correlates of HPV4 acceptability and calculated effect sizes using a random-effects model, following PRISMA guidelines. We critically reviewed policies that exclude boys from publicly funded HPV vaccination.

**RESULTS:** Of 301 identified studies, 29 were included. Weighted mean HPV vaccine acceptability was 50.4 (SD=21.5) (100-point scale) across 22 studies (n=8360); in nine studies reporting sexual orientation, acceptability was 58.44 (SD=16.76) among MSM (n=986) and 50.98 (SD=19.67) among heterosexuals (n=1713) (t (2699)=0.24, p=0.81). In meta-analyses, perceived HPV4 benefits, anticipatory regret,

and healthcare provider (HCP) recommendation had medium effect sizes on acceptability. Concerns about cost-effectiveness, health equity, and benefits of universal versus targeted vaccination emerged as central to HPV4 policy.

**CONCLUSIONS:** Given disproportionate HPV-associated disease burden among MSM, the unfeasibility of widespread targeted vaccination of young MSM before sexual debut, gender-based health equity concerns, and the suboptimal HPV4 coverage among boys and girls in Canada support extending publicly-funded HPV4 programs to boys/young men. Targeted messaging for young MSM to support perceived HPV4 benefits and of HCP to promote HPV4 recommendation for boys may further support HPV4 coverage among MSM.

## Basic Sciences: HIV Virology/Pathogenesis I

### Sciences fondamentales : Virologie / pathogénèse du VIH I

## O025

### A NOVEL HOST PROTEIN COMPLEX REGULATES HIV GENE EXPRESSION THROUGH CORE PROMOTER SPECIFIC RECOGNITION: A KEY TO LATENCY?

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The capacity of HIV to rapidly establish latent infection is a major obstacle to finding a cure for HIV infection. A pivotal step controlling latency is the activation of HIV transcription by host cell proteins in concert with the HIV trans-activating protein Tat. Tat trans-activation requires the well-studied TAR RNA of the nascent viral transcript to recruit P-TEFb, as well as a less-well understood DNA element within the HIV core promoter, termed TASHET. Our team has focused on the identification and characterization of host cell pre-initiation complexes (PICH) that bind TASHET to regulate HIV transcription, since these represent potential targets to control HIV latency. Using DNA affinity chromatography followed by mass spectrometry analysis, we have identified a novel series of host cell proteins that recognize TASHET. PICH-130 and PICH-35 are components of a novel HDAC complex and the silencing of their expression via siRNA reduces HIV transcription in cellulo. We have recently shown that PICH-35 binds directly and specifically to CTGC motifs within TASHET. We therefore propose that PICH-35 nucleates the formation of host cell complexes upon the HIV core promoter. Our data reveal that another host cell protein termed PICH-115 interacts directly with the core domain of HIV Tat and can bind TAR RNA in vitro in concert with Tat. Silencing of PICH-115 expression by siRNA strongly inhibits HIV transcription, suggesting it can act as a novel cofactor for Tat trans-activation. Our ongoing characterization of PICH components should provide new mechanistic information into the control of HIV latency.

## O026

### GENOMIC NON-B DNA IS A NEW FACTOR THAT INFLUENCES RETROVIRAL INTEGRATION: IMPLICATIONS FOR HIV LATENCY AND CURE-FOCUSED ANTIRETROVIRALS

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During infection, the HIV genome incorporates itself into the cellular genome through integration process, leading to life-long infection that is typically accompanied by a period of latency. The potential for a single virion to restart infection despite therapy means that total elimination of all latently-infected cells is necessary for curing infection. Several findings suggest that integration location has the potential to confound anti-latency treatments, necessitating a greater understanding of integration site selection and its effect on latency. We discovered that non-B DNA motifs (nBDMs) attract integration of HIV genome. nBDMs form structures that assume higher energy state conformations and are facilitated at

specific sequence motifs by the free energy generated from negative super-coiling, arising from processes such as transcription and protein binding. We performed bioinformatic analyses of murine leukemia virus (MLV), avian sarcoma leucosis virus (ASV) and human T-lymphotropic virus (HTLV) integration site datasets and observed that these integration sites are also enriched in or near nBDMs, showing that the preference for nBDMs is not specific to HIV and plays an important role in the integration of diverse retroviruses. We also identified a strong nBDM consensus sequence flanking integration sites. Interestingly, the simple retroviruses ASV and MLV exhibited a strong preference for integration directly within nBDMs, whereas the complex retroviruses HIV and HTLV preferred to integrate near nBDMs rather than within the motifs themselves. We also compared the integration site profiles of acute and latent models of HIV infections. Integration sites in both datasets were enriched near nBDMs. Remarkably, integration sites in latently-infected cells were substantially enriched near specific nBDMs, up to 84% of total integration sites. This is important since nBDMs can inhibit expression of nearby genes and possibly proviruses. Our data will help inform the design of experiments in HIV eradication research and better retroviral gene therapy vectors.

## O027

### MODULATION OF HIV-INFECTED T CELL MOTILITY BY NEF IN VIVO

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Upon entry into the body through mucosal surfaces, HIV-1 disseminates to remote lymphoid and non-lymphoid tissues, leading to a chronic infection of the immune system. Previous in vitro studies have shown that specialized virological synapse (VS) formations between infected and uninfected cells can greatly enhance viral transmission and dissemination. However, it is currently unclear whether such cell-to-cell contacts remain sufficiently stable within lymphoid tissues where immune cells are constantly undergoing migration. Here, we utilized intravital microscopy techniques to visualize the dynamic behavior of HIV-infected T cells in the lymph node of humanized mice using infectious, GFP-reporter HIV. Surprisingly, we found that most productively infected T cells migrated robustly, albeit at reduced speeds, compared to uninfected T cells. We now show that the reduction in motility speeds is due to the expression of Nef and its ability to disrupt the actin cytoskeletal machinery by binding to Pak2. Prolonged cell-to-cell interactions were observed in the presence of functional Nef, suggesting that the formation of virological synapse was modulated by its expression. We will discuss how alterations in cellular motility impacts on HIV pathogenesis in vivo.

## O028

### IDENTIFICATION OF A HOST CELL FACTOR, PICH-115, THAT COUPLES THE TAT/TAR AXIS TO THE HIV CORE PROMOTER

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Today, there are 35 million people living with HIV infection worldwide. Nearly 2 million people have died of HIV/AIDS in 2012 alone. Anti-retroviral therapy (ART) is used to prevent infection by targeting multiple facets of the viral replication cycle. However, the biggest barrier to HIV eradication comes from the fact that the virus quickly establishes a latent reservoir by successfully integrating its genome into its host's DNA. Unfortunately, due to the fact that ART has considerable side effects, unreasonable costs and limited accessibility by most of the infected population globally, it is imperative that a cure is found for HIV/AIDS. In order to tackle the problem of latency it will be essential to specifically control HIV transcription of latent proviruses. We have recently shown that a sequence of nucleotides within the core promoter of HIV, named TASHET, plays a pivotal role in the formation of a pre-initiation complex of HIV (PICH). We have successfully been able to identify cellular components of this complex that render it specific to the HIV promoter compared to the canonical AdMLP. We have shown that one of these components, PICH115, a cell host factor with a molecular weight of 115KDa, can bind specifically and directly the HIV trans-activating protein, Tat in vitro. Moreover, the silencing of endogenous PICH-115 by siRNA results in strongly reduced HIV transcription in HeLa cells. Together our results

suggest that it may be the bridge between TASHET and the Tat-TAR trans-activation complex and reveal PICH-115 as a novel therapeutic target to control HIV latency. Our imminent goals will be to study the functions of PICH-115 involved in the regulation of the HIV promoter activity and in its interaction with Tat.

## O029

### HIV-1 NEF INDUCED CD4+ T CELL DEATH IS ASSOCIATED WITH THE INHIBITION OF PROTEINS ACTIVATING THE AKT PATHWAY

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**BACKGROUND:** The majority of the productively HIV-1 infected CD4+T cells undergo programmed cell death. Multiple factors including induction of pro-apoptotic HIV-1 proteins, microbial translocation across the breached gastrointestinal tract and activation induced T cell death drive apoptosis during HIV infections. In this study, we investigate the pro-apoptotic role played by the HIV-1 accessory protein Nef and explore the cell signalling pathways hijacked by Nef to modulate cell survival.

**RESULTS:** Apoptosis was quantified by live cell staining of SupT1 cells infected with the replication incompetent pNL4-3 pseudovirus or the corresponding nef deletion mutant. The levels of apoptotic marker expression were 2.3 fold lower ( $p=0.0011$ ) in the nef deletion mutant and were partially dependent on two Nef motifs (P72xxP75 and W113). In addition, Nef induced a two-fold increase in activated caspase-3/7 activity. The serine/threonine kinase Akt is a vital protein in controlling cell survival and is activated by growth factors and cytokines. To gain insight into the signalling pathways contributing to Nef-induced apoptosis, we measured the activation status of Akt protein using phospho-specific flow cytometry. Strikingly, Akt phosphorylation (Thr308 and Ser473) was increased in the absence of Nef. Consistent with this observation, increased phosphorylation of proteins associated with the Akt pathway was noticeable for phosphatidylinositol 3-kinase, the PTEN c-terminal tail and mTOR. Mechanistic studies further indicated that the nef deletion mutant maintained increased phosphorylation of the pro-apoptotic protein BAD reducing its mitochondrial accessibility and higher expression levels of the anti-apoptotic protein Bcl-xL.

**CONCLUSION:** HIV-1 Nef hijacks the Akt pathway to induce apoptosis. Elucidating the mechanistic details of this pathway enhances our understanding of the strategy used by HIV-1 for inducing cell death.

## O030

### HUMAN IMMUNODEFICIENCY VIRUS TYPE 1 EMPLOYS THE CELLULAR DYNEIN LIGHT CHAIN 1 PROTEIN FOR VIRAL UNCOATING AND REVERSE TRANSCRIPTION

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The Dynein is a microtubule (MT) associated protein complex that mediates retrograde transport of macromolecules. Although Dynein has also been implicated in viral uncoating and retrograde transportation of HIV-1 preintegration complex (PIC) for successful entry into nucleus, the cellular and/or viral factors that mediate HIV-1 PIC-Dynein targeting and their contribution to early stage HIV-1 replication is still unknown.

In the present study, we have investigated the potential interactions between HIV-1 PIC associated viral proteins and cargo adaptor proteins of dynein, and their role in early stage HIV-1 replication. By using co-immunoprecipitation assay, we have examined the interaction of HIV-1 Integrase (IN), reverse transcriptase (RT), Matrix, and Capsid proteins with Dynein adaptor proteins such as Dynein light chain 1 (DYNLL1), Dynein light chain Tctex-type 1 (Tctex1), and Dynactin p150 in 293 T cells. Results showed that only IN interacted with DYNLL1. This interaction was further confirmed in HIV-1 infected C8166 T cells and by in vitro binding assay. To evaluate the functional significance of DYNLL1/IN interaction, we used a gene knockdown (KD) approach and found that down regulation of DYNLL1 expression has impaired HIV-1 replication at reverse transcription step. Furthermore, by mutational analysis of putative DYNLL1 interaction motifs in IN, we identified the motifs "52GQVD" and "250VIQD" in IN as essential for DYNLL1 interaction.



The DYNLL1 interaction-defective IN mutant HIV-1 (HIV-1INQ53A/Q252A) exhibited impaired reverse transcription. Significantly, we have found a relatively faster HIV-1 uncoating in DYNLL1-KD cells or in infections with HIV-1INQ53A/Q252A mutant virus, suggesting that IN and DYNLL1 interaction is required for the proper uncoating of HIV-1 and contributes to efficient reverse transcription.

Overall, our study demonstrates the novel interaction between HIV-1 IN and cellular DYNLL1 proteins and the requirement of this viral-cellular interaction for the early stage of HIV-1 replication, including the proper uncoating and reverse transcription.

### O031

#### LOSS OF SPLENIC TFH CELLS IN SIV-INFECTED RHESUS MACAQUES

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Follicular T helper cells (T<sub>fh</sub>), a subset of CD4 T lymphocytes, are essential for B cell activation and provide help to B cells in the production of antigen-specific antibody. Although several studies have analyzed the dynamics of T<sub>fh</sub> cells in the context of AIDS by analyzing peripheral blood and LNs of HIV-infected patients. Paradoxically, none of these studies in HIV/SIV infection have addressed the role of T<sub>fh</sub> cells in the primary organ of B cell activation, the spleen.

To address the dynamic of splenic T<sub>fh</sub> cells, we infected rhesus macaques with SIVmac251 (20 AID50). Animals were sacrificed at different time points post infection and lymphoid organs were recovered. T<sub>fh</sub> cells (PD-1<sup>high</sup>CXCR5<sup>+</sup>) and CD4<sup>+</sup> T cell subsets were monitored by flow cytometry. Concomitantly B cell subsets were also analyzed. CD4 T cell subsets were sorted and SIV DNA was quantified by RT-PCR.

Herein, we demonstrated for the first time that the percentages and numbers of splenic T<sub>fh</sub> cells decrease early during the acute phase in macaques infected with SIV. This profound loss and abnormal differentiation of T<sub>fh</sub> is also associated with the loss of memory B cell subsets. Moreover, SIV DNA is detected in splenic T<sub>fh</sub> cells early after infection. Finally, our results showed at the chronic phase that the frequency of splenic T<sub>fh</sub> and memory B cells are higher in non-progressors compared to progressors RMs. Altogether, our results demonstrate the drastic depletion of splenic activated and tissue memory B cells which might be related to the loss of fully matured T<sub>fh</sub> cells.

This work was supported by CIHR (Canadian Institute of Health Research) to JE. JE thanks the Canada Research Chair program for financial assistance.

### O032

#### DIFFERENCES IN NEF-MEDIATED DOWNREGULATION OF MHC I, CD28 AND CD4 BETWEEN MAJOR HIV-1 SUBTYPES

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Since its emergence in Central Africa, the Human Immunodeficiency Virus type 1 (HIV-1) has undergone continuous selective pressure leading to a staggering degree of genetic diversity. Indeed, the ability of HIV-1 to withstand rapid and extensive mutations to its genome is one of the reasons the HIV/AIDS epidemic has been so devastating. Currently, there are over 10 major subtypes of HIV-1 that are responsible for more than 90% of worldwide infections, however, research has been limited to only a few of these subtypes. We aimed to study the impact of this genetic variability in the HIV-1 protein Nef, which plays a key role in the ability of HIV-1 to evade immune surveillance, modulate T cell activation and increase viral replication by downregulating cell surface receptors MHC I, CD28 and CD4, respectively. Cell surface MHC I and CD28 levels were measured in HIV-1 pseudoinfected human T cells expressing Nef proteins from 10 major HIV-1 subtypes (A1, A2, B, C, F1, F2, G, H, J, and K). CD4 cell surface levels were measured by transfecting CD4<sup>+</sup> HeLa cells with expression plasmids encoding select Nef-GFP fusion proteins. MHC I, CD28 and CD4 were labeled using fluorescently conjugated antibodies and downregulation efficiency was measured by flow cytometry. Our results demonstrate that MHC I, CD28 and CD4 are differentially

downregulated between subtypes. Differences in downregulation efficiency were attributed to variations in Nef protein expression, which was determined by western blot analysis and confirmed by flow cytometry. Our study represents a comprehensive analysis of Nef function among HIV-1 subtypes and provides increased relevancy as the use of an HIV-1 based expression system provides results in the context of a viral infection. These findings support further study of all major HIV-1 subtypes and emphasize the need to consider subtype differences when developing alternative treatment options.

## Clinical Sciences: Co-Infections

## Sciences cliniques : Coinfections

### O033

#### LEDIPASVIR/SOFOSBUVIR FOR 12 WEEKS IN PATIENTS CO-INFECTED WITH HCV AND HIV-1

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<sup>5</sup>New York City, NY; <sup>6</sup>Baltimore, MD, USA

**BACKGROUND:** Historically HIV/HCV was considered a negative predictor of response to interferon/ribavirin (IFN/RBV). For sofosbuvir-based regimens, HIV/HCV patients have achieved similar SVR rates as HCV mono-infected patients. We evaluated the safety and efficacy of LDV/SOF in HCV genotype 1 or 4 patients HIV/HCV in the Phase 3 ION-4 study.

**METHODS:** HCV TN and TE HIV/HCV patients on stable, approved antiretroviral (ARV) regimens received LDV/SOF (90mg/400mg) OD for 12 weeks. Patients with compensated cirrhosis were eligible. Permitted ARVs included TDF+FTC, with RAL, EFV or RPV. Safety evaluations included AE and laboratory parameter monitoring in addition to enhanced renal toxicity monitoring, CD4 count and HIV-1 RNA levels. The primary endpoint was SVR12.

**RESULTS:** 335 patients with GT1a (75%), GT1b (23%) and GT4 (2%) were enrolled; 82% were male, 61% were white, mean age was 52 (range 26-72), mean baseline HCV RNA was 6.7 log<sub>10</sub> IU/mL (range 4.1-7.8), median baseline CD4 count was 662 cells/μL (Q1, Q3=469, 823), 20% had cirrhosis, 24% were IL28B CC genotype and 55% had failed prior HCV treatment. Patients were taking EFV (48%) or RAL (44%) or RPV (9%). Table shows SVR12 by ARV regimen. The SVR12 rate was 96% (320/335); 2 patients had on-treatment virologic failure likely due to non-compliance, 10 had relapse after discontinuing treatment. SVR12 was similar among non-cirrhotic (96%) and cirrhotic (94%) patients and also among TN (94%) and TE (97%) patients. No patient had confirmed HIV rebound (HIV-1 RNA ≥ 400 copies/mL). No patients discontinued due to an AE. AEs occurring in ≥ 10% of patients were headache (25%), fatigue (21%) and diarrhea (11%). No significant lab abnormalities were observed.

**CONCLUSIONS:** LDV/SOF administered once daily for 12 weeks is highly effective and well tolerated in treatment-naïve/experienced, GT1/4 HCV-infected patients with HIV-1 co-infection, including cirrhosis.

**Table: SVR12 by HIV ARV regimen and Overall**

| Virologic Response          | TDF+FTC+ EFV<br>(N=160) | TDF+FTC+ RAL<br>(N=146) | TDF+FTC+ RPV<br>(N=29) | Overall<br>(N=335) |
|-----------------------------|-------------------------|-------------------------|------------------------|--------------------|
| SVR12, n (%)                | 151 (94)                | 141 (97)                | 28 (97)                | 320 (96)           |
| On-Treatment Failure, n (%) | 1 (<1)                  | 0                       | 1 (3)                  | 2 (<1)             |
| Relapse, n (%)              | 8 (5)                   | 2 (1)                   | 0                      | 10 (3)             |
| Other, n (%)                | 0                       | 3 (2)                   | 0                      | 3 (<1)             |

### O034

#### FAVOURABLE IFNL3 GENOTYPES AND LIVER FIBROSIS IN HIV-HEPATITIS C (HCV) CO-INFECTED INDIVIDUALS FROM THE CANADIAN CO-INFECTION COHORT

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**BACKGROUND:** Liver fibrosis progression is faster in HIV-HCV co-infected individuals due to an elevated inflammatory profile. Interferon Lambda-3 (IFNL-3), encoded by the IFNL3 gene (formerly IL28B), has antiviral and pro-inflammatory properties, though reports of its association with liver fibrosis are inconsistent. Homozygous recessive SNPs (rs12979860CC, rs8099917TT) in this gene are linked to spontaneous HCV clearance and better treatment response, possibly via functional variant rs8103142, which causes a lysine-arginine substitution at position 70(K70R). We examined the relationship between IFNL3 genotypes and significant liver fibrosis (AST-to-platelet ratio index (APRI)  $\geq 1.5$ ) in HIV-HCV co-infected Canadians.

**METHODS:** From the prospective Canadian Co-infection Cohort (n=1176), HCV RNA-positive participants free of fibrosis, end-stage liver disease and chronic Hepatitis B at baseline (n=612) were included. Cases (n=126) developed an APRI  $\geq 1.5$  over follow-up. Cox proportional hazards was used, adjusting for sex, ethnicity, alcohol use, age, CD4 count ( $\leq 350$  vs.  $350+$ ), HCV genotype 3 vs. non-3, baseline APRI, and a product term between rs8099917 and rs8103142. Multiple imputation accounted for missing data. Haplotype analysis was performed, adjusted for ethnicity.

**RESULTS:** Overall 69% were male with median HCV duration=17 years. 126 participants developed fibrosis over 1346 person-years of risk (event rate= 9.40/100 person-years, 95% CI=7.90, 11.20/100 p-y). Beneficial genotypes at rs8099917 and rs8103142 individually increase the risk of significant liver fibrosis, HR (95% CI) = 1.96 (1.18, 3.26) and 3.51 (1.15, 10.70), respectively. When present together, each genotype modifies the other (product term p-value=0.03), resulting in a protective effect, verified by haplotype analysis. Inheritance of TCT, a haplotype with beneficial alleles at all 3 SNPs, is protective (OR=0.52, 95% CI=0.39, 0.70).

**CONCLUSIONS:** Our results suggest that rs8099917 and rs8103142 are individually linked to a higher rate of liver fibrosis among HIV-HCV co-infected Canadians. When present together, these SNPs reduce fibrosis risk. Larger studies in other populations are needed to confirm these effects as well as functional studies to examine any potential biological interactions.

### O035

#### ADVANCED FIBROSIS IN HIV/HEPATITIS C (HCV) CO-INFECTED PATIENTS IS ASSOCIATED WITH INCREASED PREVALENCE OF HIV DRUG RESISTANCE IN BRITISH COLUMBIA, CANADA

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<sup>1</sup>Vancouver; <sup>2</sup>Burnaby, BC

**BACKGROUND:** HCV-related disease is associated with duration of infection. Co-infected individuals may also have longer duration of HIV infection and increased risk for virologic failure on ART. Presence of HIV drug resistance may affect HCV antiviral therapy due to ART interactions with direct-acting antiviral agents (DAAs). We evaluated the association between advanced liver fibrosis and presence of HIV drug resistance in co-infected patients in British Columbia, Canada.

**METHODS:** Data were analyzed from a cohort of HIV-infected individuals followed through the Provincial HIV Drug Treatment Program between January 1, 1992 and December 31, 2013. Co-infection was defined as the presence of HCV antibody/RNA. Advanced fibrosis was defined on the basis of APRI ratio  $> 1.5$  or history of end-stage liver disease event. Factors associated with presence of NRTI/NNRTI resistance mutations were assessed in co-infected individuals using multivariable logistic regression adjusted for age at ART initiation, gender, HIV risk group (PWID vs. MSM), duration of ART use, and presence of advanced fibrosis.

**RESULTS:** Overall 8318 individuals were included, 42% were co-infected and 30% had evidence of prior NRTI/NNRTI resistance. Co-infected individuals were more likely to have history of IDU (39% vs. 2%,  $p < 0.001$ ), have evidence of resistance (34% vs. 29%,  $p < 0.001$ ) and be on a PI-based

regimen (48% vs. 38%,  $p < 0.001$ ) than mono-infected individuals. Amongst co-infected individuals, those with advanced fibrosis (n=488, 14%) were more likely to have resistance (45% vs. 32%,  $p < 0.001$ ) compared to those without advanced disease. In multivariable analysis presence of resistance was associated with advanced fibrosis (odds ratio [OR] 1.34; 95% CI 1.08 – 1.65), age at ART start (0.88; 95% CI 0.80 – 0.96) and duration of ART use (OR 1.15; 95% CI 1.13 – 1.16).

**CONCLUSION:** HIV/HCV co-infected individuals with advanced fibrosis have higher burden of HIV drug resistance compared to those with less advanced liver disease. Presence of HIV drug resistance may limit HCV DAA options due to restriction of potential HIV regimen switches.

### O036

#### IDENTIFYING HCV TREATMENT BARRIERS AS PART OF COMMUNITY PORTABLE POP-UP CLINICS

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**BACKGROUND:** Currently there is little information on what is preventing high risk vulnerable populations from engaging in HCV care. The aim of this study was to survey this population using a targeted questionnaire and to identify barriers to HCV care. This was administered during community portable pop-up clinics (PPCs) at specific locations frequented by people who inject drugs (PWID).

**METHODS:** Participants were recruited at PPCs held at different community-based centers in Vancouver's Downtown East Side. During these PPCs OraQuick HCV Rapid Antibody point of care testing was offered. Participants who were tested were then offered to complete a questionnaire while they waited for test results.

**RESULTS:** Between January and December 2014, 581 individuals completed the questionnaire (123 female, 53.9% Caucasian, 32.0% First Nation; mean age: 45.2). Amongst all participants, 392 reported prior HCV testing (67.5%), 118 identified sharing needles (20.3%), 210 injected drugs (36.1%), 301 were previously incarcerated (51.8%), 299 were aware of a HCV cure (51.5%) and 452 stated they would consider treatment if they had HCV (77.8%). Among HCV positive individuals, 139 of 165 participants reported prior HCV testing (84.2%), 107 were aware of their positive status (64.9%), 113 were previously incarcerated (68.5%) and 114 would consider treatment (69.1%). With regards to HCV treatment, 39.2% of participants believed that they did not need treatment, 18.6% did not know where to go for treatment, 26.3% expressed concern regarding side effects of treatment, 19.5% did not believe they can financially afford it and 11.5% reported not wanting to consult a physician to receive treatment.

**CONCLUSIONS:** Barriers such as inaccessible medical care, unfamiliarity with available resources, and concerns regarding treatment side effects have been identified. Organized and targeted community events such as PPCs increase likelihood of reaching out to high risk inner city populations to address these barriers in a systematic way.

### O037

#### PREVALENCE AND DISTRIBUTION OF ONCOGENIC HUMAN PAPILLOMAVIRUS (HPV) TYPES IN HIV-POSITIVE AND HIV-NEGATIVE MEN WHO HAVE SEX WITH MEN (MSM) IN TORONTO, CANADA: IMPLICATIONS FOR ANAL CANCER SCREENING AND VACCINE COVERAGE

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**BACKGROUND:** Anal infection with oncogenic, high-risk HPV (HR-HPV) is a key step in anal cancer pathogenesis, with HPV-16 and -18 being the types most commonly implicated. This is a significant health concern for MSM, and a malignancy disproportionately affecting those who are HIV-positive. With no large-scale anal cancer screening or HPV vaccination programs for MSM, and the suboptimal performance of cytology in predicting high-grade dysplasia, there is an urgent need to add to the evidence base to optimize management strategies for precancerous lesions.

**METHODS:** HIV-positive and HIV-negative MSM were recruited from a large primary care clinic in Toronto. Participants completed a sociobe-

havioural questionnaire and self-collected anal swabs for HPV-DNA testing using a Luminex-based assay detecting 46 types, including 13 high-risk types. We compared the proportions with detectable HPV-DNA using Chi-square tests.

**RESULTS:** We recruited 442 MSM; 294 were HIV-positive and 148 HIV-negative. Median age was 45 and 44 years, respectively. The majority of HIV-positive and HIV-negative MSM had had  $\geq 50$  lifetime sexual partners (80.6% and 72.3%, respectively), and half of the men in each group reported anal sex in the preceding 6 months. The presence of any HPV type was more common in HIV-positive MSM (88.4% vs. 77.9%;  $P=0.0043$ ), as was the presence of any HR-HPV (67.6% vs. 51.7%;  $P=0.0013$ ) and  $\geq 2$  HR-HPV types (29.2% vs. 13.8%;  $P=0.0004$ ). HR-HPV types were common among HIV-positive men; these differences were statistically-significant ( $P<0.05$ ) for HPV-16 (34.9% vs. 23.5%) and HPV-18 (16.9% vs. 8.3%).

**CONCLUSIONS:** In this sexually-experienced group of MSM, anal HPV infection is very common, and a majority in both populations have infection with HR-HPV. These burdens are amplified for HIV-positive MSM. Our results support the need for HPV vaccination in MSM, and highlight the importance of further investigating the incorporation of HPV testing – particularly for HPV-16/18 – along with cytology, into anal cancer screening algorithms for MSM.

### O038

#### CERVICAL CYTOPATHOLOGY IN HIV POSITIVE WOMEN VACCINATED WITH THE QUADRIVALENT HPV VACCINE

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**BACKGROUND:** HPV infection and cervical dysplasia are common among HIV positive women and progression to cervical cancer is more rapid. HPV vaccines have demonstrated high immune response and effectiveness in preventing HPV infection and cervical dysplasia in HIV-negative women, but data is limited in HIV-positive women.

**METHODS:** Demographic, clinical and HIV data was collected as part of an open labeled, multi-centered study of seroresponsiveness to the quadrivalent HPV vaccine in HIV-positive females. Participants received 3 doses (0,2,6 months) of the qHPV (types 6,11,16,18) vaccine. Cervical sampling was conducted using liquid based cytology (months 0,6,12,18,24) reported by Bethesda criteria, and HPV testing was done concurrently with the Linear array assay (Roche diagnostics).

**RESULTS:** Baseline cytology in 290 women was: 77% normal, 4% ASCUS, 13% LSIL, 1% ASC-H, and 5% HSIL. Of the 170 women with month 18 or 24 post vaccine cytology, 97% received all three doses of the vaccine. These vaccinated participants had a median age of 40 years (IQR: 34-46; range: 16-66), median years since HIV diagnosis of 9 years (IQR: 5-12), median CD4 at first vaccination of 496/mm<sup>3</sup> (IQR:383-684), and 71% had HIV RNA<50/mL. Of women with a normal cytology at baseline, 15(5.1%) progressed to ASCUS, LSIL or HSIL over 370 person-years of follow-up for this cohort. The incidence rate for abnormal cytologies was 4.1/100 person years (95% CI: (2.3-6.7)). None of the following risk factors for progression of cervical dyskariosis were statistically significant: age, CD4, nadir CD4, presence of oncogenic HPV, HIV viral load status.

**CONCLUSION:** Of the 15 women who progressed to cervical dyskariosis, none had evidence of new infection with HPV 6, 11, 16 or 18, suggesting the qHPV vaccine is protective against HPV-induced lesions caused by vaccine types. Even in a cohort of highly HPV exposed women.

### O039

#### PAP CYTOLOGY TESTING AMONG HIV-POSITIVE AND HIV-NEGATIVE WOMEN IN ONTARIO, 2008–2013: SUBOPTIMAL FOR CERVICAL CANCER PREVENTION

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**BACKGROUND:** Cervical cancer caused by oncogenic types of the human papillomavirus (HPV) is of concern among HIV-positive women due to impairment of immune responses required to control HPV infection. Fortunately, this cancer is preventable with Pap cytology screening followed by management of detected dysplasia. We calculated annual rates of cytology testing in 2008–2013 among screen-eligible women in Ontario and compared these by HIV status. We hypothesized that HIV-positive women would be more likely to undergo testing due to guideline recommendations and higher burden of disease.

**METHODS:** We conducted a retrospective, population-based cohort study using health administrative data housed at the Institute for Clinical Evaluative Sciences. For each year in 2008–2013, eligible individuals were female, aged 21 to 70 years, alive, and residents of Ontario with no prior record of hysterectomy or cervical cancer diagnosis. HIV-positive women were identified using a validated algorithm (Antoniou PLoS One 2011). We report the annual proportions of women undergoing at least one cytologic test.

**RESULTS:** A total of 2,600 HIV-positive and 4,732,223 HIV-negative women were included in findings presented in the Table.

|      | Percent HIV+ women (95% CI) | Percent HIV- women (95% CI) | Age-adjusted ratio of proportions (95% CI) |
|------|-----------------------------|-----------------------------|--|
| 2008 | 36.0 (33.5-38.5)            | 37.1 (37.1-37.2)            | 0.94 (0.88-1.01)                           |
| 2009 | 36.6 (34.2-39.1)            | 37.4 (37.4-37.5)            | 0.95 (0.89-1.02)                           |
| 2010 | 35.8 (33.5-38.2)            | 36.5 (36.4-36.5)            | 0.96 (0.90-1.02)                           |
| 2011 | 35.6 (33.3-37.9)            | 36.0 (35.9-36.1)            | 0.97 (0.91-1.03)                           |
| 2012 | 34.0 (31.9-36.2)            | 31.7 (31.6-31.7)            | 1.05 (0.99-1.12)                           |
| 2013 | 30.3 (28.3-32.3)            | 19.8 (19.8-19.8)            | 1.50 (1.40-1.60)                           |

**CONCLUSIONS:** Annual testing rates were low for HIV-positive women and, for most years, they were no more likely to undergo testing than HIV-negative women despite heightened cancer risk. There was a concerning drop among HIV-positive women following the 2012–2013 release of new guidelines for less frequent screening among HIV-negative women although annual screening continues to be recommended for HIV-positive women. Further research is needed to identify health system, provider, and individual barriers for screening to inform targeted interventions.

### O040

#### EFFECT OF INTERCURRENT INFECTIONS AND VACCINATIONS ON IMMUNE AND INFLAMMATORY BIOMARKERS AMONG HIV-INFECTED ADULTS ON SUPPRESSIVE ANTIRETROVIRAL THERAPY

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**BACKGROUND:** Systemic inflammation and immune activation persists in HIV-infected persons despite suppressive antiretroviral therapy (ART) and may contribute to adverse health outcomes. Inflammatory biomarkers are increasingly being measured in HIV-infected persons, but whether intercurrent infections and vaccinations confound these values is unclear.

**METHODS:** We pooled data from two studies among HIV-infected adults with HIV RNA<50 copies/mL on ART. Study 1 was a 6-month prospective cohort examining the impact of herpes simplex virus type 2 (HSV-2) on CD38+CD8+ T cells, CD38+CD4+ T cells, regulatory T cells, IL-1b, IL-6, MCP-1, TNF, angiopoietin 1/2 ratio, sICAM-1, sVCAM-1 and hsCRP.



Study 2 was an 18-week randomized trial of valacyclovir vs. placebo on the same biomarkers. Primary results from both studies were null. We used generalized estimating equations adjusted for study cohort and time since baseline to quantify the impact of vaccination or intercurrent infection in the preceding 2 weeks on each biomarker.

**RESULTS:** 144 participants (84 from Study 1) were included, of which 87.5% were male and 66% HSV-2 co-infected. Median (IQR) CD4 count was 492 (355, 648). Most participants were current (29.9%) or former (29.2%) smokers. Recent infection/vaccination was reported at 85/482 (17.6%) of study visits, most commonly upper respiratory tract infections (n=48 episodes), HSV reactivations (n=18) and influenza vaccination (n=16). These events were not associated with significant changes in biomarker levels with the exception of hsCRP, which increased by 0.339 (95% CI=0.22, 0.458) log<sub>10</sub> ng/mL or 2.183 µg/mL in adjusted analyses (see Table; \*denotes odds ratio of having an undetectable value).

| Biomarker            | Univariable        |         | Multivariable      |         |
|----------------------|--------------------|---------|--------------------|---------|
|                      | Est (95% CI)       | p       | Est (95% CI)       | p       |
| CD38+CD8+ T cells    | 0.38 (-0.69,1.46)  | 0.49    | 0.37 (-0.72,1.45)  | 0.51    |
| CD38+CD4+ T cells    | 0.15 (-0.20,0.50)  | 0.42    | 0.16 (-0.19,0.50)  | 0.38    |
| Regulatory T cells   | 0.08 (-0.18,0.34)  | 0.53    | 0.09 (-0.17,0.35)  | 0.49    |
| IL-1b*               | 1.25 (0.76,2.08)   | 0.38    | 1.25 (0.76,2.06)   | 0.38    |
| IL-6*                | 1.01 (0.67,1.52)   | 0.98    | 1.01 (0.66,1.53)   | 0.98    |
| MCP-1*               | 1.15 (0.83,1.61)   | 0.40    | 1.16 (0.82,1.64)   | 0.40    |
| TNF*                 | 0.95 (0.62,1.47)   | 0.83    | 0.97 (0.63,1.50)   | 0.90    |
| Ang1/2 ratio (Log10) | -0.07 (-0.16,0.01) | 0.08    | -0.07 (-0.16,0.01) | 0.09    |
| sICAM-1              | 8.82 (-2.60,20.2)  | 0.13    | 9.10 (-2.43,20.6)  | 0.12    |
| sVCAM-1              | 6.93 (-18.5,32.3)  | 0.59    | 7.78 (-17.3,32.9)  | 0.54    |
| hsCRP (Log10)        | 0.341 (0.22,0.461) | <0.0001 | 0.339 (0.22,0.458) | <0.0001 |

**CONCLUSIONS:** Intercurrent infections/vaccinations were associated clinically relevant increases in hsCRP but not other immune and inflammatory biomarkers in these ART-treated adults, and should be routinely assessed in studies where hsCRP is measured.

## Epidemiology and Public Health: Understanding and Preventing New Infections

## Épidémiologie et santé publique : Compréhension et prévention des nouvelles infections

### O041

#### TRANSMISSION CLUSTERING FUELLING THE MEN-HAVING-SEX-WITH-MEN (MSM EPIDEMIC) IN QUEBEC IS DRIVEN BY VIRAL DYNAMICS RATHER THAN SEXUAL NETWORKS

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**INTRODUCTION:** Transmission clustering is sustaining the MSM epidemic in Quebec in the post-antiretroviral therapy (ART) era. Phylogenetic, virological, and behavioural data were combined to describe factors contributing to large cluster outbreaks.

**SUBJECTS AND METHODS:** Phylogenetic analysis was performed on sequence datasets from 5,828 new diagnoses (2002-2013), first genotyped during primary or chronic stage infection, using nucleotide mixed-base call assays to estimate recency of infection. MSM infections (n=4027) were stratified as solitary transmissions (n=1755), 219 small (2-4, n=562), 66 large (6-9, n=426) and 52 X-large (10-116, n=1284) clusters. PHI cohort data (1998-2013) provided sequence, behavioural, and virological data on 379 MSM (n=210 untreated for 2 years). The SPOT site provided testing habit and behavioural data on 1790 MSM (2009-2011).

**RESULTS:** Disturbingly, half of onward spread of MSM epidemics could be ascribed to 2.5% of viral lineages (n=52), averaging 25 infections/cluster, expanding over 18 month intervals. These latter variants showed significantly lower quasispecies diversity than the 84% of lineages leading to dead-end transmissions (58% vs. 25% <0.44% diversity, median 0.13% vs. 0.40%, respectively). Variants belonging to large (n=98) and small (n=57) clusters elicited extended high viremia (median 4.7 log copies/mL) over two-year periods as compared to solitary group lineages (n=54) whose viremia fell to set-point nadirs after 6 months. Although 14%, 18%, 27% and 30% of persons in unique, small, large and X-large cluster groups were under 30 years, risk behaviours were similar with 0-4%, 70-74%, 7-10% and 10-14% of participants reporting 0, 1-4, 5-9, 10+ partners three months prior to infection. SPOT observational data show poor testing habits with half of persons untested in the last year (median 4 years).

**DISCUSSION:** Frequent testing and immediate ART initiation is needed to avert the selection of large cluster variants overcoming transmission bottlenecks. Studies are ongoing to characterize signature features allowing for their selection.

### O042

#### ENHANCED SURVEILLANCE OF HIV AND RISK BEHAVIOURS AMONG MONTREALERS OF SUB-SAHARAN AFRICAN AND ENGLISH-SPEAKING CARIBBEAN ORIGIN – RESULTS OF THE FIRST E-TRACK SURVEY IN CANADA

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**BACKGROUND:** HIV prevalence differs substantially by race and ethnicity in Canada and in Quebec. We completed a survey to describe risk behaviours and HIV prevalence among Montrealers born in Sub-Saharan Africa (MSSA) and in the English-speaking Caribbean countries (MESC).

**METHODS:** From June 2013 to February 2014, a voluntary, anonymous, cross-sectional survey of 1602 participants, 15 to 49 years of age (1105 MSSA and 497 MESC) was conducted. Recruitment strategies included social events (ethnic festivals, churches), neighborhood venues (malls) and fixed sites (associations). Participants provided a biological specimen tested for HIV, hepatitis C and syphilis antibodies and completed a computer-assisted questionnaire. Correlates of having ≥1 casual heterosexual partner (e.g., “one-night stand”; past 12 months) were ascertained using multivariable logistic regression.

**RESULTS:** Of 1958 eligible individuals solicited, 1602 (81.8%) participated with the majority providing a biological sample of sufficient quantity for testing (96.4%, (1545/1602)). Among MSSA, the overall HIV prevalence was 1.7% (95% CI: 1.1-2.6%), 1.2% (0.5-2.4%) among males and 2.4% (1.2-4.2%) among females. Of the 18 HIV-positive MSSA, 38.9% were aware of their infection. Among MESC, overall HIV prevalence was 0.8% (0.3-2.1%), 0.9% (0.2-3.2%) among males and 0.8% (0.2-2.8%) among females. Of the 4 HIV-positive MESC, none were aware of their infection. Correct knowledge of modes of HIV transmission was significantly lower for MESC compared to MSSA. Six out of 10 (60.7%; 963/1587) did not have a family physician. Participants reporting ≥1 casual heterosexual partner (n=1106) were more likely to be male (AOR=5.0; p<0.0001), single (AOR=7.9; p<0.0001), unemployed (AOR=2.7; p=0.046), to have had sex in an HIV-endemic country (past 5 years; AOR=2.9; p=0.001), and HIV testing ≤2 years (AOR=2.2; p=0.034).

**CONCLUSION:** This successfully implemented first E-Track survey highlights the importance of potential HIV risks in these populations. HIV/AIDS prevention interventions must address their unique needs.



#### O043

### THE ROLE OF INTERPERSONAL FACTORS IN SHAPING SEXUAL HIV RISK AMONG SEX WORKERS AND THEIR NON-PAYING PARTNERS

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**BACKGROUND:** Globally, sex workers report substantially lower condom use with their intimate or non-paying partners (NPPs) than with commercial partners. To explore the role of non-paying partnerships in shaping HIV-related vulnerability, this study investigated interpersonal factors associated with inconsistent condom use among sex workers and their NPPs in Vancouver, Canada.

**METHODS:** Baseline data (2010-2013) were drawn from an open prospective cohort of sex workers, AESHA (An Evaluation of Sex Workers' Health Access), in Metro Vancouver. Multivariable logistic regression using generalized estimating equations was used to identify interpersonal factors associated with inconsistent condom use (i.e., <100% in the last six months) with up to three NPPs reported per sex worker. Adjusted odds ratios and 95% confidence intervals were reported (AOR [95% CI]).

**RESULTS:** Overall, 369 sex workers reported having at least one NPP (mean=2.2 NPPs per sex worker), with 70.1% of the study data reporting inconsistent condom use in the last six months. In the study, 11.2% and 14.3% of NPPs had sexual relationships with other sex workers or other non-commercial female partners, respectively, in the last six months. In multivariable analysis, factors significantly associated with increased odds of inconsistent condom use included: having a regular cohabiting NPP (5.49 [2.60-11.58]) or a regular non-cohabiting NPP (2.17 [1.14-4.11]) (versus casual NPP), providing drugs to a NPP (3.12 [1.54-6.31]), providing financial support to a NPP (2.45 [1.09-5.51]), and having a NPP provide physical safety (2.21 [1.20-4.09]). Non-injection drug use was significantly associated with reduced odds of inconsistent condom use (0.37 [0.20-0.67]).

**CONCLUSIONS:** Our study highlights the important role of interpersonal factors in shaping HIV risk pathways for sex workers and their intimate or NPPs, and potentially for NPPs' other commercial or non-commercial sexual partners. Efforts to reduce HIV risk for sex workers and their non-commercial partners should incorporate gender-focused and empowerment-based strategies, as well as male- and couple-focused interventions.

#### O044

### THE CEDAR PROJECT: PSYCHOLOGICAL DISTRESS AND HIV VULNERABILITY AMONG YOUNG INDIGENOUS PEOPLE WHO USE DRUGS IN THREE CANADIAN CITIES

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For the Cedar Project Partnership<sup>1,2,3</sup>

<sup>1</sup>Vancouver; <sup>2</sup>Prince George; <sup>3</sup>Chase, BC

**BACKGROUND:** Very little is understood regarding associations between concurrent trauma, addiction, psychological distress and HIV and HCV vulnerability among Indigenous men and women in Canada.

**METHODS:** The Cedar Project is a cohort study of young Indigenous people aged 14-30 who used drugs in Vancouver, Prince George, and Chase, BC. Participants were eligible for this analysis if they completed a baseline Symptom Checklist-90-Revised (which provides an average measure for severity of psychological distress), returned for at least one follow-up visit between 2010-2012, and completed the Childhood Trauma Questionnaire. Adjusted linear mixed effects models (LME) estimated the effect size (B) and 95% confidence intervals (CI) of study variables on mean change in psychological distress scores separately for men and women.

**RESULTS:** In total, 202 participants were eligible; 53% were women, and the mean age was 28 years. Baseline psychological distress scores were significantly higher for women (1.25) than men (0.81), ( $p < 0.001$ ). In the LME models for men, factors associated with increased psychological distress included: emotional abuse ( $B = 0.57$ ; 95% CI: 0.21-0.93), physical abuse ( $B = 0.48$ ; 95% CI: 0.14-0.82), physical neglect ( $B = 0.41$ ; 95% CI: 0.01-0.82), blackouts from drinking ( $B = 0.24$ ; 95% CI: 0.05-0.44), and sex work ( $B = 0.95$ ; 95% CI: 0.44-1.47); while living by traditional culture was associated with reduced psychological distress ( $B = -0.20$ ; 95% CI: -0.39, -0.01). In the LME models for women, factors associated with

increased psychological distress included: emotional abuse ( $B = 0.60$ ; 95% CI: 0.29-0.91), physical abuse ( $B = 0.37$ ; 95% CI: 0.06-0.68), physical neglect ( $B = 0.55$ ; 95% CI: 0.26-0.83), blackouts from drinking ( $B = 0.30$ ; 95% CI: 0.05-0.55), sex work ( $B = 0.32$ ; 95% CI: 0.12-0.52), and sexual assault ( $B = 0.50$ ; 95% CI: 0.30-0.70); while having tried to quit using drugs was associated with reduced psychological distress ( $B = -0.25$ ; 95% CI: -0.47, -0.02).

**CONCLUSION:** Public health providers must provide culturally-safe mental health supports to young Indigenous people who use drugs and address harmful coping patterns that may exacerbate psychological distress and increase vulnerability to HIV and HCV infection.

#### O045

### DEVELOPING BEST PRACTICES FOR CLINICAL POLICIES AND PROCEDURES FOR SUPERVISED INJECTION SERVICES WITHIN INTEGRATED HEALTH CARE SETTINGS IN CANADA

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**ISSUES:** The importance of integrating health care and harm reduction services, including supervised injection services (SIS), for persons who use illicit drugs has been recognized for over 20 years in Europe and is becoming increasingly well recognized in Canada. Despite this, there is not a standard of best practices for clinical policies and procedures for SIS in integrated health care settings in Canada.

**DESCRIPTION:** Since 2002, the Dr. Peter Centre (DPC) has integrated SIS within a broad range of health care services for people living with HIV in its Day Health Program and 24-hour Specialized Nursing Care Residence. The DPC started the service for its clients after the College of Registered Nurses of British Columbia (CRNBC) confirmed that it was within the scope of nursing practice to supervise injections for the purposes of preventing illness and promoting health. It has evolved to include the interface with other professional disciplines. DPC clinical policies and procedures for SIS include ones which address agreement for services, the parameters of nursing involvement, role of other professional disciplines, counselling and addiction treatment, dealing with emergencies, record-keeping and the disposal of biohazards and controlled substances.

**LESSONS LEARNED:** While DPC clinical policies and protocols were prepared in consultation with the CRNBC to conform to the scope of nursing practice, developing clinical policies and procedures for SIS is a complex process in an environment that engages other professional disciplines in addition to nursing.

**RECOMMENDATION:** A review and evaluation of policies and procedures for health care organizations providing SIS in an integrated setting is needed for the Canadian health care context so that organizations interested in applying for an exemption under Section 56 of the Controlled Drugs and Substances Act (CDSA) can do so with a complete range of policies and procedures that meets best practice standards.

#### O046

### CONDOM USE DURING ANAL INTERCOURSE AND OTHER PREVENTION STRATEGIES AMONG HIV-POSITIVE MSM IN VANCOUVER, BRITISH COLUMBIA

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**BACKGROUND:** Our objectives were to identify factors associated with condom-use during anal intercourse among HIV-positive MSM in Vancouver and to determine what preventive attitudes and alternative strategies were employed by MSM who did not report using condoms.

**METHOD:** We analyzed data from participants in the Momentum Health Study collected at enrollment on their most recent sexual encounter with each of up to five sexual partners in the past six months. Explanatory factors included psychosocial scales on HAART Optimism, Sexual Altruism, Sexual Sensation Seeking (SSS), and Cognitive Escape. Of all sexual encounters where anal intercourse was reported, factors associated

with condom-use versus not were determined using manual backward stepwise multivariable generalised linear mixed models.

**RESULTS:** 648 sexual encounters were reported by 184 self-identified HIV-positive participants. Most encounters included anal intercourse (72.4%), during which condoms were used 22.6% of the time. Lower odds of condom-use were associated with event-level GHB substance use (vs. not: AOR=0.12, 95% CI:0.02-0.77), being certain their partner was HIV-positive (vs. unknown status: AOR=0.28, 95% CI:0.11-0.73), reporting more anal sex events with this partner in the past 6 months (AOR=0.86, 95% CI:0.77-0.97), and higher scores on SSS (AOR=0.86, 95% CI:0.78-0.94) and Cognitive Escape (AOR=0.93, 95% CI:0.88-0.99). Higher Sexual Altruism community sub-scale scores were positively associated with condom-use (AOR=3.32, 95% CI:2.00-5.50). HAART Optimism was not associated with condom-use. HIV-positive men who reported condomless anal intercourse were also more likely to report asking partners their HIV status (AOR=3.43, 95% CI:1.71-6.91), only having sex with other HIV-positive men (AOR=3.64, 95% CI:1.78-7.43), and only having sex with men on treatment or with low viral loads (AOR=2.32, 95% CI:1.12-4.80). MSM who reported condomless anal intercourse were more likely to hold differing attitudes to those MSM who used condoms: e.g. more likely to agree that “knowing a sex partner’s viral load is just as important as knowing their HIV status” (AOR=2.39, 95% CI:1.09-5.21). **CONCLUSION:** Psychosocial traits, attitudes, and substance use are important predictors of condom-use and HIV-positive men who report condomless anal intercourse employ various prevention strategies that consider HIV status and viral load.

#### O047

##### CHALLENGES TO PROVIDING HIV RISK AND PREVENTION INFORMATION ONLINE TO GAY, BISEXUAL AND OTHER MEN WHO HAVE SEX WITH MEN: PRELIMINARY FINDINGS FROM AN ENVIRONMENTAL SCAN OF CANADIAN AGENCY WEBSITES

**Gilbert, Mark<sup>1,2</sup>; Dulai, Joshun<sup>2</sup>; Wexler, Daniel<sup>2</sup>; Martin, Susan<sup>3</sup>; Young, Ingrid<sup>3</sup>; Wilton, James<sup>1</sup>; Tooley, Len<sup>1</sup>; Hart, Trevor<sup>1</sup>; Michelow, Warren<sup>2</sup>; Donelle, Lorie<sup>4</sup>; Flowers, Paul<sup>3</sup>; Ferlatte, Olivier<sup>2</sup>**  
<sup>1</sup>Toronto, ON; <sup>2</sup>Vancouver, BC; <sup>3</sup>Glasgow, United Kingdom; <sup>4</sup>London, ON

**OBJECTIVES:** Health agency websites are a central hub for providing and accessing HIV information. We aimed to scope information provided about HIV risk and prevention on Canadian agency websites relevant to MSM. Our scan examined topics covered, how information was displayed, and the reading grade level of online information.

**METHODS:** Eligible sites provided information relevant for MSM on HIV risk or prevention, were from community or government agencies, and for the public. Sites were found by google search using French and English search terms, expert suggestion, and review of links. Eligibility and content for review was determined by two independent reviewers, with data collected by a single reviewer using a standardized form and entered into Epi-Data (final results based on dual review will be presented). Reading grade level and usability scores were assessed through Flesch-Kincaid and LIDO instruments, respectively. Analyses were conducted in SPSS.

**RESULTS:** Of 49 eligible sites 25% were campaigns, 21% and 78% were community or government agencies respectively, 26% were focused on MSM, 19% were French/bilingual. 49 sites included on average 7.9 of 20 topics on HIV risk, with sero-sorting (22%), viral load (15%) and acute HIV (15%) being least frequent. 46 sites included an average on average 6.4 of 24 topics on HIV prevention, with treatment as prevention (13%) and PrEP (9%) being least frequent. Almost all sites presented information by text, with a median reading grade level of 10. Less common were use of tables, images, or graphs to present information; only 4% used interactive or tailored features. On usability scoring, sites scored lower on functionality and engagement domains.

**DISCUSSION:** Overall we observed less information about emerging topics and a reliance on text with high reading requirements. Updating content, communicating information effectively, and engaging audiences appeared common challenges for assessed websites.

#### O048

##### FRONTLINE MEASURES: WHAT CAN EVALUATION AT ASOS TELL US ABOUT HIV PREVENTION KNOWLEDGE AND EVIDENCE – RESULTS FROM A CASE STUDY

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 Toronto, ON

A key response to HIV has been the delivery of prevention programs by diverse AIDS Service Organizations (ASOs). While there is research that assesses the effectiveness of individual HIV prevention programs, challenges have been identified in the uptake of these programs. There is a lack of clarity on how ASOs measure success, and a deeper understanding of this could enhance monitoring and evaluation (M&E) practice in the sector.

In this presentation, I summarize the findings and conclusions of my doctoral research about HIV prevention program M&E at ASOs. Employing a constructivist approach, I carried out a qualitative case study of 2 ASOs, conducted in-depth interviews with 23 managers, staff, volunteers, and government funders; I reviewed approximately 100 documents. A community reference group which included practitioners, policymakers and people living with HIV provided advice on key stages of the project.

In this research, the complexity and plurality of HIV prevention programming and M&E emerged. M&E practices employed by these ASOs included one-time evaluations, routine monitoring, and tacit assessments. The ways in which these informed each other was complex. Tacit knowledge was drawn upon to make explicit information derived from M&E required by government funders meaningful. Accountability to government funders required M&E that was different than what was needed to maintain relationships with the communities these organizations served. Overall, there were differences in the ways that this community of practice understood success and built knowledge compared to research that evaluates the effectiveness of interventions.

A deeper understanding of M&E at ASOs can contribute to responses to the evidence-based practice movement. This research describes community-based discernment strategies that shed light on the knowledge-building processes in communities, which is an important part of practice-based evidence and program science. The lessons learned may be a resource for evaluators, policymakers, and other stakeholders in HIV prevention.

##### Social Sciences: Experiences of HIV among African, Caribbean, and Black Communities, Aboriginal Peoples and Recent Immigrants

##### Sciences sociales : Expériences du VIH dans les collectivités africaines, antillaises et noires et chez les Autochtones et les immigrants récents

#### O049

##### THE CEDAR PROJECT: RESILIENCE IN THE FACE OF HIV VULNERABILITY AMONG YOUNG INDIGENOUS PEOPLE WHO USE DRUGS IN THREE CANADIAN CITIES

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<sup>1</sup>Vancouver; <sup>2</sup>Chase; <sup>3</sup>Prince George, BC

**BACKGROUND:** Most HIV research involving Indigenous people is based on deficit models of health and limited in cultural/practical relevance. Indigenous scholars have urged health researchers to identify factors related to cultural connectedness that may protect against HIV infection and buffer the effects of historical/lifetime trauma among Indigenous peoples.

**METHODS:** The Cedar Project is a cohort study of young Indigenous people who use illicit drugs in Vancouver, Prince George, and Chase, British Columbia. Participants completed the Childhood Trauma Questionnaire and the Connor-Davidson Resilience Questionnaire between 2011-2012. Adjusted linear mixed effects models (LME) estimated the

effect of the size (B) and 95% confidence intervals (CI) of study variables on mean change in resilience scores.

**RESULTS:** Overall, 191 participants were eligible; 51% were women, the mean age was 28.9 years, 48% had a parent who attended residential school, 71% had been in foster care. Only 8% of participants reported no childhood maltreatment, while 39% reported severe sexual abuse, 41% severe physical abuse, 33% severe emotional abuse, 20% severe emotional neglect, and 39% severe physical neglect. Factors associated with diminished mean resilience scores included severe emotional neglect (B=-13.34, 95% CI: -21.25, -5.42), smoking crack daily or more (B=-5.42, 95% CI: -10.66, -0.18), having been sexual assaulted (B=14.4, 95% CI: -28.09, -0.76), and having blackouts from drinking (B=-6.19, 95% CI: -11.62, -0.75). Factors associated with higher mean resilience scores included having a family that often/always lived by traditional culture (B=7.70, 95% CI: 2.53-12.86) or often/always spoke their traditional language (B=10.52, 95% CI: 5.72-15.33). Participants who were currently often/always living by traditional culture (B=6.50, 95% CI: 0.86-12.14) knew how to speak a traditional language (B=13.06, 95% CI: 4.85-21.26), and had sought drug/alcohol treatment (B=4.84, 95% CI: 0.35-9.33) also had significantly higher mean resilience scores.

**CONCLUSION:** In the aftermath of colonization, cultural foundations continue to function as buffers that protect young Indigenous people from severe health outcomes, including HIV infection.

## O050

### THE SEVEN PATHS OF RESILIENCE: FINDINGS FROM THE TWO-SPIRIT HIV/AIDS WELLNESS AND LONGEVITY STUDY (2SHAWLS)

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**BACKGROUND:** Despite numerous obstacles, many two-spirit and/or gay/bisexual HIV-positive Aboriginal men (TS PHAs) who have been living with HIV for a long time report they are doing well. This study was designed to bring together a team of researchers comprised of Aboriginal and non-Aboriginal community members and academics to examine the ways in which two-spirit men with HIV understand the skills, resources, knowledge and practices that contribute to their resiliency and wellbeing.

**METHODS:** Three Aboriginal sharing circles (focus groups) were conducted in Toronto, Hamilton, and Ottawa, Ontario, Canada. Participants were men (n=14) who identify as TS PHAs, who were living with HIV for 8 years or more. The sharing circles were modeled after a traditional Aboriginal sharing circle and involved symbol-based inquiry to stimulate dialogue about strengths, assets, and resiliency. Through the use of the Medicine Wheel (MW), participants were invited to discuss historical, biomedical, social, spiritual, sexual, and behavioural factors affecting their health, wellness and resiliency. Qualitative data were coded and analyzed using NVivo 10. A participatory analysis approach was used to extrapolate themes and relationships from participants' quotations and mapped across the MW. Validity was established by verifying coding work and utilizing member-checking of the findings with our community advisory committee.

**RESULTS:** Through the analysis of participants' discussion, the Seven Paths of Resiliency arose as integral components of their health, wellness, and resiliency. The Seven Paths of Resiliency are: (1) Worldview, (2) Finding One's Strength, (3) Walking Towards Balance, (4) Recognizing True Power, (5) Mino-bimaadiziwin (living the way of a good life), (6) Self-care, and (7) Living Our Truth.

**CONCLUSIONS:** Through an active community/academic partnership with meaningful engagement to address the resiliency of long term HIV-positive TS PHAs, the results identify the ways in which TS PHAs understand their own resiliency. The methods and findings have broad implications for advancing the development of knowledge necessary to address the needs and concerns of those who have been living with HIV longer term.

## O051

### WHAT SHOULD ALL CANADIAN HEALTHCARE STUDENTS LEARN TO INCREASE HEALTH EQUITY FOR ABORIGINAL PEOPLES LIVING WITH HIV: PERSPECTIVES ON POSTCOLONIALISM AND HEALTH

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<sup>1</sup>Toronto; <sup>2</sup>Ottawa, ON; <sup>3</sup>Dartmouth, NS

**OBJECTIVE:** Colonialism is at the heart of disproportionate HIV-related mortality and morbidity experienced by Aboriginal Peoples in Canada. Postcolonialism is a theoretical approach that enables healthcare professionals (HCPs) to better understand and address health inequities. Yet, the literature is silent on how to incorporate postcolonialism into healthcare training. This study explores strategies for including postcolonialism into the training of all HCPs in Canada.

**METHODS:** This descriptive qualitative study involved in-depth, 45 to 60 minute semi-structured interviews with nineteen individuals with insight into postcolonialism and health in Canada, including academics, clinicians and Aboriginal Peoples. Interviews were transcribed verbatim. Data were analyzed collaboratively to identify, code and translate key emergent themes according to the six phases of the DEPICT method.

**RESULTS:** Postcolonialism was viewed as an essential tool for all Canadian HCPs to better address health inequities in Canada, including among Aboriginal Peoples living with HIV. Participants described content that should be included into training programmes, who should teach it, when it should be taught and how it should be delivered. In particular, participants emphasized that curricula related to postcolonialism and health should: (1) include a foundation in Canadian colonial history; (2) be integrated longitudinally using a variety of interactive teaching strategies; and (3) be developed in collaboration with local communities. Findings reinforce the importance of understanding health and health care as situated in social, political and historical contexts, often rooted in colonialism.

**CONCLUSION:** This is the first empirical study to provide Canadian healthcare educators with guidance for incorporating postcolonialism and health into healthcare training programs. This is a key step for improving access to and quality of care for people living with HIV.

## O052

### CONDOM USE AMONG AFRICAN, CARIBBEAN, AND BLACK YOUTH IN WINDSOR, ONTARIO

Maticka-Tyndale, Eleanor<sup>1</sup>; Mihan, Robert<sup>1</sup>; Kerr, Jelani<sup>2</sup>;

Chan, Lydia<sup>1</sup>; Gbadebo, Kenny<sup>1</sup>; Omorodion, Francisca<sup>1</sup>;

Pierre-Pierre, Valerie<sup>3</sup>; Travers, Robb<sup>4</sup>

<sup>1</sup>Windsor, ON; <sup>2</sup>Louisville, KY, USA; <sup>3</sup>Toronto; <sup>4</sup>Brantford, ON

African, Caribbean and Black (ACB) people carry a disproportion burden of HIV infection in Canada. This CIHR funded study examines social and sexual predictors of condom use at first and most recent penile-vaginal intercourse (PVI) among ACB youth.

**METHOD:** Between April, 2013 and March, 2014, 543 16-25 year old ACB participants living in the Windsor area of Ontario, recruited using Respondent Driven Sampling, completed a survey inquiring about sexual behaviours and social/living situations. Logistic regression examined potential social, partner, and sexual predictors of condom use at first and most recent PVI.

**RESULTS:** Of the 273 participants reporting PVI, 22% reported condom use at first and 61% at most recent PVI. Those more likely to report condom use at first PVI were younger, students, and either Muslim or Christian (as compared to having no religious affiliation). Condom use at most recent PVI was more likely for Christians or those with no religious affiliation, students, those who reported consuming alcohol prior to PVI and those whose first partner was ACB. They were least likely to use a condom at most recent PVI if their partner was more than 4 years older than they and had a history of more sexual partners than they did.

**CONCLUSION:** Results contribute to a sparse body of knowledge about sociological and sexual correlates of condom use among ACB youth. Religious affiliation and student status influence condom use at first and most recent PVI. Alcohol use (short of drunkenness) does not appear to inhibit condom use at most recent sex, although having an older and more experienced partner does. This provides guidance for locations for



interventions encouraging condom use (e.g., religious and educational institutions) and the contexts that need to be addressed (e.g., alcohol as part of sexual encounters and the age and experience of partners).

## O053

### HIV/AIDS RELATED STIGMA AMONG AFRICAN, CARIBBEAN, AND BLACK YOUTH

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**BACKGROUND:** Although HIV-related stigma undermines effective HIV treatment and prevention strategies, there is little research on what primes HIV-related stigma, or on HIV-related stigma among priority populations in Canada.

**RESEARCH FOCUS:** This CIHR funded study uses Goffman's stigma theory (1963) as elaborated by Link and Phelan (2001), combined with Henry's low-status compensation theory (2009) to examine factors which influence expressions of stigmatizing attitudes against people living with HIV or AIDS among 16- to 25-year-old African, Caribbean, and Black (ACB) youth.

**METHOD:** Between April, 2013 and March, 2014, 543 16-25 year old ACB participants living in the Windsor area of Ontario, recruited using Respondent Driven Sampling, completed a survey using ACASI methods. Structural equation modeling using responses of 519 youth estimated the direct influence of religiosity, religious denominations, experiences of discrimination, HIV test history, and sex on HIV/AIDS stigma, as well as the indirect influences of select variables on stigma through HIV/AIDS knowledge and sexual health service use.

**RESULTS:** Model estimation revealed significant negative associations between knowledge and religiosity, stigma and knowledge, and stigma and HIV testing. Muslim and male participants had significantly higher stigma scores than non-Muslim and female participants.

**CONCLUSIONS:** This is one of the few studies that examines contributors to stigmatizing attitudes related to HIV. Results support a focus on knowledge about HIV/AIDS as a potentially important inhibitor of stigma. The importance of culturally, religiously, and gender competent knowledge enhancing and stigma reducing initiatives is also highlighted in these results.

## O054

### HIV RISK WITHIN MARRIAGE: GENDERED PERSPECTIVES OF INDIAN IMMIGRANTS IN CANADA

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Hamilton, ON

In the context of immigration, cultural ideals of family and marriage have remained important for South Asian groups living in the West (e.g., Dale & Ahmed, 2011; Grewal, et al., 2005). Although marriage as an institution does not suggest a static relationship to gender inequality, empirical studies in India have revealed married women's salient HIV vulnerability as a result of their husbands' extramarital sex (Newmann, et al., 2000; Chatterjee & Hosain, 2006). While immigrants from India represent one of the largest visible minority groups in Canada, we know little about the impacts of immigration on their intimate relationships, sexual practices, and responses to related sexual health risks within marriage.

This paper explores the gendered impacts of immigration on the HIV risk faced by Indian immigrants in Canada, paying closer attention to the role of marriage in mediating gender relations in their post-immigration lives. Our data was collected through qualitative interviews with 15 female and 12 male immigrants from the Punjabi community living in Ontario.

The post-immigration employment challenges led to a high concentration of these men in certain occupations (e.g., long-distance truck driving), which exposed them to health risks associated with commercial sex. Despite women's increasing participation in employment outside the home, marriage, family, and community were perceived as integral to their cultural identities and social support networks. While men tended to take advantage of the newfound sexual freedom in Canada, many women were concerned about the HIV risk within marriage due to their constrained capacity to discuss and negotiate safer sex. The findings confirm the need

for the Indo-Canadian community and families to play a creative yet crucial role in addressing the HIV risk faced by immigrant women and men through attending to both the silence surrounding the disease and the gender inequality embedded in HIV vulnerability.

## O055

### "IT'S FOR US – NEWCOMERS, LGBTQ PERSONS AND HIV-POSITIVE PERSONS. YOU FEEL FREE TO BE": SOCIAL SUPPORT GROUPS AS AN HIV PREVENTION STRATEGY WITH LGBTQ AFRICAN, CARIBBEAN AND BLACK NEWCOMERS AND REFUGEES IN TORONTO, CANADA

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**BACKGROUND:** African, Caribbean and Black (ACB) populations in Canada are over-represented in the HIV epidemic. Social drivers of HIV – including racism, sexual stigma, and HIV-related stigma – enhance HIV vulnerability among ACB populations. The Black Coalition for AIDS Prevention implements monthly peer support and psycho-education groups: (1) Rainbow Sistahs (RS), for lesbian, gay, bisexual, transgender and queer (LGBTQ) ACB women, and (2) Foreign Integration (FI), for LGBTQ ACB newcomers and refugees. We explored perceived benefits of social support group participation among LGBTQ ACB newcomers and refugees in Toronto, Canada.

**METHODS:** We conducted three focus groups with ACB participants (n=29) who attended RS, FI or both. We conducted semi-structured individual interviews with healthcare and social service providers (n=5) from AIDS service organizations and community health centres serving ACB populations. Interviews and focus groups were recorded, transcribed verbatim, and analyzed using narrative thematic techniques.

**RESULTS:** Focus group participants (n=29; mean age: 30.5 years [SD 8.0]; cis-male: 51.7%, cis-female: 37.9%, transgender: 10.4%) attended FI (64.3%), RS (10.7%) and both RS and FI (25.0%). Participants identified as bisexual (42.9%), gay (32.1%), and lesbian (17.9%). All participants were born outside of Canada (70.4% Caribbean; 29.6% African) and most (79.3%) came as refugees. Findings revealed multi-level social and health benefits of social support group participation. Individual/micro level benefits included intrapersonal (e.g. HIV knowledge, self-acceptance, reduced depression) and interpersonal (e.g. friendships, networks) dimensions. Social/meso level benefits included community connectedness and reduced stigma (HIV-related, sexual). Structural/macro level benefits included increased access to employment, housing, immigration and refugee services, and health care.

**IMPLICATIONS:** Findings highlight the synergistic effects of social exclusion produced through multiple forms of marginalization, including sexuality and newcomer/refugee status. Social support groups tailored for LGBTQ ACB newcomers and refugees have the potential to address the complexity of social, legal, economic and health issues that elevate HIV vulnerability.

## O056

### CHINESE IMMIGRANTS' PERCEPTIONS ABOUT AND RESPONSES TO HIV RISK IN INTERRACIAL INTIMATE RELATIONSHIPS: UNDERSTANDING POWER AND AGENCY IN A TRANSNATIONAL CONTEXT

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Interethnic and interracial intimate relationships are integral to an ethnoculturally diverse society. Between 2001 and 2006, Canada witnessed a rapid increase – at a rate of 30% – of mixed unions, five times higher than the growth for all couples (6.0%) (Milan, Maheux, & Chui, 2010). Based on a CIHR-funded transnational study of the recent generation of Chinese immigrants in Canada, this paper examines these individuals' HIV vulnerability in the context of interracial intimate relationships, paying closer attention to the role of their transnational perspectives – such as their HIV knowledge, risk awareness, and social positioning across coun-

tries – in mediating their perceptions about and responses to HIV risk. The data was collected through in-depth interviews with 61 participants at four sites (Beijing, Shanghai, Toronto and Vancouver). While the structural barriers (e.g., foreign credential recognition and employment) to successful settlement are often seen as challenging for individual immigrants to overcome, this study reveals that sex or intimate relationships (both heterosexual and same-sex) – especially with local white Canadians – were perceived by some participants as a venue to pursue personal freedom, sexual desires, relative sexual and gender equality, and/or accelerated integration. The asymmetrical yet fluid power relations embedded in the intimate encounters have compromised some participants' abilities to negotiate safer sex on the one hand, and enabled others the room for a more autonomous relationship on the other hand. We contend that interracial intimate relationship is a site where the exemplified inequalities – perceived power differentials related to nation-state, language, culture, race/ethnicity, sexuality and gender – can be both accommodated and resisted, which has differentially shaped those individuals' capacities to respond to HIV risk. The findings suggest the need for researchers and service providers to "think transnationally" about the complex relations of power of agency when addressing immigrants' HIV vulnerability in the context of interracial intimate relationships.

## Basic Sciences: HIV Virology / Pathogenesis II

## Sciences fondamentales : Virologie / pathogénèse du VIH II

### O057

#### RECOMBINANT CAULOBACTER CRESCENTUS DISPLAYING ANTI-HIV-1 PROTEINS PROVIDE PROTECTION FROM HIV-1 INFECTION IN VITRO AND IN VIVO

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Human Immunodeficiency Virus (HIV) infects over 2.7 million people annually. More than half of the new infections occur in women, and the majority of these women are in developing countries where societal norms may prevent them from insisting on condom use. As such, new prevention options are urgently needed. We previously proposed the development of an HIV-1 specific microbicide using the S-layer mediated display capabilities of the non-pathogenic freshwater bacterium *Caulobacter crescentus*. We have successfully expressed 17 diverse anti-HIV proteins on the surface of *C. crescentus*, including MIP1alpha, CD4 decoy receptor, fusion inhibitors, and anti-viral lectins. Using an in vitro viral blocking assay, we have demonstrated that 12 of the recombinant *C. crescentus* are able to provide significant protection from infection with HIV-1, with protection levels reaching 74% with MIP1alpha. In vivo studies with immune-competent mice indicate that application of *C. crescentus* to the vaginal tract does not induce the production of inflammatory cytokines or recruitment of immune cells. We are continuing our in vivo studies using the humanized bone marrow-liver-thymus (BLT) mouse model of HIV-1 infection. We have combined the implantation of human fetal liver and thymus tissue with the intravenous injection of autologous CD34+ cells into NOD-scid IL2Rnull mice to create BLT mice and we have demonstrated that the peripheral blood of these mice contains 40-50% human CD45+ cells, including CD4+ and CD8+ T cells, B cells, myeloid cells, and NK cells. Our initial data indicates that these mice are susceptible to intravaginal infection with HIV-1JR-CSF. Subsequent experiments have demonstrated significant protection from vaginal HIV-1JR-CSF infection when recombinant *C. crescentus* is applied intravaginally at the time of HIV-1 infection. Taken together these results suggest that a *C. crescentus* based microbicide might be a safe and effective method for HIV-1 prevention.

### O058

#### TARGETING THE SR PROTEIN KINASE CLK3 TO BLOCK HIV-1 INFECTION

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<sup>1</sup>Toronto, ON; <sup>2</sup>Morgantown, WV, USA

Current anti-HIV-1 treatments target viral components but are limited by drug resistant viruses. This study focuses on disrupting viral RNA processing, a stage where HIV-1 survival is dependent upon balanced host splicing factor activity to properly process its RNA. We demonstrated that modulation of the Cdc2-like kinase (CLK) family has a substantial impact on HIV-1 gene expression (GE). It was also observed that chlorhexidine, an inhibitor of CLKs 2, 3, and 4, potently suppresses HIV-1 replication whereas TG003, an inhibitor of CLKs 1, 2, and 4, had little effect on viral GE. Given the selectivity of chlorhexidine for CLK3, it is likely that CLK3 is an important regulator of HIV-1 GE and therefore could be modulated to control viral infection. Using short hairpin RNA targeting CLK 2 or 3, we observed that depletion of CLK3 suppresses HIV-1 structural protein expression (Gag/Env) while reduction of CLK2 has negligible effects on relative viral GE. From an assay of ~60 RNA splicing modulators, we identified compound 191 as an inhibitor of CLK3 activity and HIV-1 structural [Env/Gag (IC<sub>90</sub>: 1.8 µM)] and regulatory (Rev/Tat) protein expression. We confirmed that 191 impairs viral GE/replication in a CD4+ T cell line (IC<sub>80</sub>: 4 µM) and patient PBMCs (IC<sub>80</sub>: ~1 µM) infected with HIV. Furthermore, 191 has low impact on cell viability, splicing, translation, and Tat stability. However, analysis of HIV-1 mRNAs demonstrated that 191 treatment causes only a 60% reduction in both unspliced and singly spliced RNAs encoding Gag and Env, respectively. Examination of the subcellular distribution of unspliced RNAs revealed nuclear retention after 191 treatment, explaining that Rev depletion further impacts structural protein expression by blocking export of their RNAs. This study confirms that CLK3 is a key factor for efficient viral GE and suggests its targeting for the therapeutic control of HIV-1 infection.

### O059

#### USING MODULATORS OF RNA PROCESSING AS A NOVEL THERAPEUTIC STRATEGY FOR HIV INFECTION

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The success of current anti-HIV treatment regimens targeting viral enzymes and host cell entry is limited by the growing emergence of drug-resistant strains of HIV. Therefore, drugs targeting different stages of the virus lifecycle are vital for continued success in combating HIV infection. Since HIV gene expression is critically dependent upon controlled splicing of the viral transcript, small molecule modulators of RNA processing hold tremendous promise as novel anti-HIV drugs. To identify such compounds, we screened a subset of splicing modulators for their effect on HIV-1 Gag protein expression. Of the sixty compounds examined, we identified four, 892, 791, 833 and 191, that strongly suppress HIV-1 gene expression as well as viral structural and regulatory proteins. Subsequent analysis of HIV-1 RNA abundance revealed that the compounds reduced levels of unspliced and singly spliced viral mRNAs, with limited effects on multiply spliced (MS) mRNAs. To explore the discrepancy between HIV-1 MS mRNA levels and the expression of encoded regulatory factors, Rev and Tat, the effect of these compounds on viral protein stability, HIV-1 mRNA localization, and protein synthesis were examined. Results indicate that the compounds do not enhance viral protein turnover and induce little to no alteration of cellular protein synthesis or alternative splicing of >9,000 host RNA splicing events. Subsequent studies have confirmed anti-HIV activity of these compounds in the context of CD4+ T cells. The distinct effects of these compounds from previously characterized HIV-1 RNA processing inhibitors Digoxin, 8-Azaguanine and 5350150, validate targeting this stage of the virus lifecycle as a novel therapy. Elucidating the mechanism by which these four compounds alter HIV-1 MS RNA expression is important for new drug development and holds key implications for novel therapeutic strategies that complement existing HIV-1 treatment options or as a second line of defense to combat drug-resistant strains of HIV.

## O060

### RESISTANCE TO A NOVEL HIV-1 INHIBITOR INDICATES DUAL TARGETING OF VPU AND A HOST CELL FACTOR

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**BACKGROUND:** The discovery of new antiviral drugs is necessary to enhance treatment options and to counter resistance. Here, we examined the mechanism of anti-HIV activity for a novel acylguanidine compound, SM111.

**METHODS:** GFP-reporter CEM T cell assays were used to test the ability of SM111 to inhibit replication of WT NL4.3, NL4.3ΔVpu (lacking vpu), and recombinant NL4.3 strains encoding major resistance mutations in pol for RTIs, PIs and INIs. Cytotoxicity was evaluated using Via-Count (Millipore). WT NL4.3 was passaged in the presence of SM111 to select resistant mutants. Vpu-mediated downregulation of CD4 and BST-2/tetherin was monitored by flow cytometry.

**RESULTS:** SM111 exhibited a nontoxic dose-dependent inhibition of HIV replication; including >95% reduction of infected (GFP+) T cells on day 7 following inoculation with WT as well as RTI, PI and INI resistant strains. Three SM111-resistant viruses were selected in vitro and all encoded mutations in the transmembrane domain of Vpu. A 5AA deletion (strain A), a stop codon at highly conserved W22 (strain C) or a substitution (I17R) (strain H) impaired Vpu-mediated downregulation of CD4 and BST-2/Tetherin. Notably, SM111 was partially active against NL4.3ΔVpu and resistant strains (52%, 92%, 54%, and 16% reduction for NL4.3ΔVpu, strains A, C, and H, respectively).

**CONCLUSIONS:** SM111 inhibited replication of WT as well as RTI, PI and INI resistant HIV-1 strains. SM111 selected major mutations in Vpu; however these mutants and a ΔVpu strain remained partially sensitive to the drug. Together, these results indicate that SM111's mechanism of action is unique from current antiretroviral drugs and suggest that SM111 targets an interaction between Vpu and an unknown host cell factor. More studies are necessary to explore this promising prototype.

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## O061

### APOBEC3F AND APOBEC3G CAN RESTRICT HIV-1 BY DIFFERENT MECHANISMS

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Host restriction factors APOBEC3F (A3F) and APOBEC3G (A3G) both has potential to inhibit human immunodeficiency virus type 1 (HIV-1) replication. HIV-1 primarily infects human T cells and macrophages, where both A3F and A3G are co-expressed in the absence of Vif. It is widely accepted that antiviral activities of A3F and A3G are predominantly mediated by deoxycytidine deamination, which causes lethal G to A mutations of the viral +DNA. Yet, some reports suggested that these proteins can also use deamination-independent mechanisms to inhibit viral replication, although the influence of this mechanism is debatable. therefore, we wanted to dissect the antiviral mechanisms of A3F and A3G. In single cycle infectivity assay with GFP expressing HIV vif, we found that compared to A3F, A3G is significantly more potent in preventing HIV-1 infection in 293T cell line. A3G inflicted large number of concentrated mutations in viral genome; whereas A3F induced mutations were less and dispersed. More than 95% of A3G induced mutations were lethal to HIV-1. In contrast, only 50% of A3F mediated mutations were able to inactivate virus. Interestingly, we found that in comparison to A3G, A3F could significantly block the reverse transcription of RNA to DNA, potentially by acting as a road-block for reverse transcriptase. These results together suggest that the mechanisms utilized by A3F and A3G to restrict HIV-1 viral replication are different.

## O062

### MG1 AND VSVΔ51 VIRUSES TARGET AND KILL LATENTLY HIV-INFECTED MYELOID CELLS

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**BACKGROUND:** Despite effective viral suppression on HAART, latent HIV reservoirs continue to present a major barrier to eradication. We propose a novel strategy to target this reservoir using a class of oncolytic viruses (OV) that include the Maraba (MG1) and Vesicular Stomatitis Virus (VSVΔ51). These recombinant OV target cancer cells by exploiting defects in type I interferon (IFN)-signaling. Similar alterations in IFN-mediated antiviral responses are also seen in HIV-infected cells, providing a crucial link between cancer cells and cells that constitute the HIV reservoir. We hypothesize that MG1 and VSVΔ51 selectively target and kill latently HIV-infected cells.

**METHODS:** Latently HIV-infected myeloid (U1 and OM10.1), as well as their respective parental uninfected controls (U937 and HL60) were infected with GFP-expressing MG1 or VSVΔ51. Productive OV infection was quantified by flow cytometry. Viability was assessed by PI, MTT, and Alamar Blue assays. Type I IFN response to OV infection was characterized by measuring IFNα secretion by ELISA and PKR expression by Western blot.

**RESULTS:** The latently HIV-infected myeloid cell lines U1 and OM10.1 were significantly more susceptible to MG1 and VSVΔ51 infection and viral cytopathic effects than the HIV-uninfected controls in both a dose- and time-dependent manner. IFNα secretion in response to OV infection increased significantly in U937 and HL60 controls compared to the latently HIV-infected cells. In addition, PKR expression under basal conditions and in response to OV infection was significantly higher in U937 than in U1 cells.

**CONCLUSIONS:** Latently HIV-infected myeloid cell lines are preferentially targeted and killed by MG1 and VSVΔ51 when compared to their uninfected parent cells. In parallel, underlying defects in type I IFN response are present in latently HIV-infected cells, which may facilitate selective targeting by OV. Therefore, our results suggest that the use of OV may represent a novel approach to selective elimination of the HIV reservoir.

## Clinical Sciences: Clinical Predictors

## Sciences cliniques : Prédicteurs cliniques

## O063

### THE IMPORTANCE OF GENDER IN UNDERSTANDING ADHERENCE: A LONGITUDINAL STUDY WITHIN A POPULATION BASED COHORT OF HIV-POSITIVE INDIVIDUALS

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**BACKGROUND:** The past decade has witnessed the feminization of the HIV epidemic globally. Gender and structural inequities that result in vulnerability to HIV infection among women may also result in vulnerability to poor HIV-related health outcomes among women living with HIV, including higher prevalence of suboptimal antiretroviral therapy (ART) adherence. We undertook this study to examine gender differences in achieving optimal adherence with long-term ART use, while controlling for established confounders such as ethnicity and injection drug use.

**METHODS:** The study sample consisted of HIV-positive adults (≥18) in British Columbia (BC) enrolled in the HAART Observation Medical Evaluation and Research (HOMER) cohort, with data collection between 2000 and 2011. Optimal ART adherence was defined as ≥95%, based on pharmacy refill compliance per six-month period from initiation of therapy onwards. Bivariate analyses and generalized linear mixed models with logistic regression were used to examine the role of gender in ART adherence. Sub-analyses compared men and women by injection drug use status and ethnicity.



**RESULTS:** Among the sample of 3,612 individuals followed for an average of 54 months, 718 (19%) of which were women, a significantly lower proportion of women achieved optimal ART adherence, within the entire sample (54.3% versus 76.3%;  $p < 0.001$ ) and per subgroup. In multivariate models, women maintained an association with suboptimal adherence, within the total study population (adjusted odds ratio [AOR]: 0.53; 95% confidence interval [CI]: 0.43 to 0.66) and among subgroups, including Aboriginal people who use injection drugs (AOR: 0.56; 95% CI: 0.39 to 0.80) and non-Aboriginal people who do not inject drugs (AOR: 0.41; 95% CI: 0.27 to 0.46).

**CONCLUSIONS:** Women living with HIV in BC, Canada, are at greater vulnerability to suboptimal ART adherence than men, overall and within subgroups. Emphasis should be placed on providing better access to women-centered HIV care and support services.

## O064

### NORMALIZATION OF CD4/CD8 RATIO AFTER LONG-TERM ANTIRETROVIRAL THERAPY: GENDER AND AGING ISSUES

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**BACKGROUND:** Following long-term antiretroviral therapy (ART) CD4/CD8 ratio is associated with AIDS and non-AIDS events, vaccine response, CD4 recovery, inflammation, immune activation and HIV reservoir size. However factors associated with normalization of CD4/CD8 ratio during long-term ART have not been elucidated.

**METHODS:** A cross-sectional study was performed on a database of HIV-1 infected patients attending the McGill University Healthcare Centre (MUHC). Adult patients with undetectable viral load ( $< 50$  copies/mL) on ART for over 12 months were included. Contribution of age, gender, ethnicity, HIV clades, last available CD4 and CD8 T cell count and percentage was analysed according to CD4/CD8 ratio.

**RESULTS:** A total of 893 subjects were analyzed and displayed the following characteristics: mean age 49 (18–84), 69.3% male, 65.3% Caucasian, 8.8% Hispanic, 22.2% Black/African and 15.6% Black/Caribbean. The CD4+ T cell counts were  $620 \pm 289$  for males versus  $656 \pm 267$  cells/mm<sup>3</sup> for females. The CD8+ T cell counts were  $917 \pm 456$  for males versus  $793 \pm 383$  cells/mm<sup>3</sup> for females. A majority of patients (64.9%) reached optimal CD4 recovery ( $> 500$  cells/mm<sup>3</sup>,  $n = 589$ ) contrasting with only 28.7% ( $n = 256$ ) who normalized their CD4/CD8 ratio ( $> 1.0$ ). In total, 21.6% patients ( $n = 210$ ) continued to display a low CD4/CD8 ratio ( $< 0.5$ ). Patients with older than 60 had a lower CD4/CD8 ratio than those younger ( $p < 0.001$ ), and females had a significant higher CD4/CD8 ratio than males ( $0.94 \pm 0.45$  versus  $0.84 \pm 0.45$ ,  $p < 0.0001$ ). Duration of ART therapy was similar no regardless of gender or age. No association between ethnicity, HIV clades and CD4/CD8 normalization was observed.

**CONCLUSION:** We report that normalization of CD4/CD8 ratio was infrequent and both gender and aging have impact on immune recovery in successfully treated patients. These study findings are pointing out the new challenge that consists of the understanding of factors associated with persistent CD8 T cell count in long-term treated patients.

## O065

### SOCIODEMOGRAPHIC AND CLINICAL CHARACTERISTICS OF HETEROSEXUAL MEN LIVING WITH HIV IN ONTARIO: INSIGHTS FROM THE OHTN COHORT STUDY

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**BACKGROUND:** The number of heterosexual men living with HIV has increased over time, but they remain an under-studied population. We report sociodemographic and clinical characteristics of heterosexual men living with HIV in Ontario.

**METHODS:** We analyzed data from the OHTN Cohort Study, a cohort of people receiving HIV care in Ontario. Data were obtained from medical charts, interviews, and laboratory record linkage. Analysis was restricted to 552 self-identified heterosexual men interviewed in 2010, 2011, or 2012. Descriptive statistics, chi-square tests, and ANOVA were used to compare characteristics of heterosexual men with 2,023 gay and

171 bisexual men, and for within-group comparisons by injection drug use (IDU) history.

**RESULTS:** 38.5% ( $n = 205$ ) of heterosexual men were born outside Canada (bisexual:  $n = 54$ , 34.8%; gay:  $n = 425$ , 22.4%;  $p < 0.0001$ ), and heterosexual men were more likely to be African/Caribbean/Black ( $n = 146$ , 26.4%; bisexual:  $n = 17$ , 9.9%; gay:  $n = 124$ , 6.1%) or Aboriginal ( $n = 75$ , 13.6%; bisexual:  $n = 15$ , 8.8%; gay:  $n = 148$ , 7.3%;  $p < 0.0001$ ). IDU history was most common among heterosexual men ( $n = 175$ , 31.7%; bisexual:  $n = 27$ , 15.8%; gay:  $n = 215$ , 10.6%;  $p < 0.0001$ ). Very late diagnosis (CD4 count  $< 200$  cells/mm<sup>3</sup> at diagnosis and/or AIDS-defining condition) was more frequent among heterosexuals ( $n = 220$ , 40.1%) relative to gay ( $n = 533$ , 26.6%) or bisexual men ( $n = 49$ , 28.8%,  $p < 0.0001$ ). The proportion on antiretrovirals was similar across groups ( $\sim 95\%$ ), yet at last follow-up, heterosexual men had significantly lower CD4 counts (mean = 501.5 cells/mm<sup>3</sup> cf gay men: 548.7 cells/mm<sup>3</sup>;  $p = 0.001$ ) and were more likely to have detectable viremia ( $n = 78$ , 15.1% cf gay men:  $n = 180$ , 9.5%;  $p < 0.0001$ ). Heterosexual men were also more likely than gay or bisexual men to have Hepatitis C, regardless of IDU history ( $p < 0.0001$ ).

**CONCLUSION:** Very late diagnosis, hepatitis C co-infection and sub-optimal virologic suppression were more common among heterosexual men. Further exploration is needed to address heterosexual men's unique challenges with timely HIV diagnosis and successful antiretroviral treatment outcomes.

## O066

### HEALTH-RELATED QUALITY-OF-LIFE (QOL) AMONG WOMEN LIVING WITH HIV IN CANADA IS ASSOCIATED WITH RECEIPT OF PERCEIVED WOMEN-CENTRED HIV CARE (WCC)

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**BACKGROUND:** Among women living with HIV (WLHIV) in Canada, we assessed whether health-related quality-of-life (QoL) differs by receipt of perceived women-centred HIV care (WCC).

**METHODS:** Baseline survey data were analyzed for WLHIV ( $\geq 16$  years) who received care in the last year, enrolled in the Canadian HIV Women's Sexual and Reproductive Health Cohort Study (CHIWOS), a longitudinal, community-based study in British Columbia (BC), Ontario (ON), and Quebec (QC). Physical and mental health QoL was assessed by the SF-12 (scored from 0-100; higher scores indicating better QoL), and WCC by measuring perception of women-centredness of care received from their HIV clinic and HIV doctor in the last year. Multivariable linear regression analyses examined the relationship between perceived WCC and QoL, adjusting for confounders.

**RESULTS:** Of 981 participants, 27% were from BC, 50% ON, and 22% QC. Median age was 44 (IQR = 36-51) and 38% identified as Caucasian, 29% as African, Caribbean, or Black, and 22% as Aboriginal. 53% and 57% perceived their HIV clinic and doctor's care (respectively) to be women-centred. Overall, mean physical and mental health QoL scores were 43.9 (SD = 14.4) and 41.6 (SD = 13.5). Physical health scores were higher among women from ON [45.4 (SD = 13.1)] and QC [45.5 (SD = 14.7)] compared with BC [39.9 (SD = 15.5)] ( $p < 0.001$ ); no variation was observed in mental health scores. Women were more likely to have lower physical and mental health scores if they were older, separated/divorced or widowed, and had an annual household income  $< \$20,000$ . In adjusted analyses, receipt of perceived WCC from an HIV clinic [ $\beta = 2.89$  (95% CI: 1.17-4.62);  $p = 0.001$ ] and HIV doctor [ $\beta = 2.57$  (95% CI: 0.84-4.30);  $p = 0.004$ ] were associated with higher mental health QoL scores.

**CONCLUSIONS:** For WLHIV in this study, mental and physical QoL was significantly lower than estimates for the general population of Canadian women and other HIV populations. Receipt of perceived WCC was associated with higher mental health QoL. Through CHIWOS, we will investigate the potential of WCC to reduce known gendered inequities in health outcomes and improve health-related QoL for WLHIV in Canada.



**O067**

**COMPARISON OF COMORBIDITIES AMONG ADULTS LIVING WITH HIV IN CANADA BY AGE GROUP: RESULTS FROM THE HIV HEALTH AND REHABILITATION SURVEY**

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**OBJECTIVE:** To describe the number and type of comorbidities among adults living with HIV in Canada and compare younger to older adults.

**METHODS:** We conducted a cross-sectional web-based online survey from October 2013-August 2014. We recruited adults living with HIV in Canada in collaboration with 27 knowledge user, community-based organizations, and clinics across Canada using electronic (emails, newsletters, websites, video) and on-site (posters, cards) strategies supplemented with snowball sampling. The survey included sections on external factors (stigma, social support), personal factors (mastery, coping, living strategies, demographic and disease characteristics), and an item asking whether participants were living with concurrent health conditions. We compared the median number and type of comorbidities for younger (<50 years) versus older (≥50 years) participants using chi-square and Mann-Whitney tests for nominal and continuous variables, respectively (p<0.05).

**RESULTS:** Of the 1850 individuals who accessed the survey, 1477 (80%) initiated and 1171 (79%) completed the survey, resulting in 941 complete and estimated valid responses. Of the 932 participants who provided age-related information (527 <50 years; 405 ≥50 years), the majority were men (79%), taking antiretroviral therapy (90%) and living with >2 concurrent health conditions (72%). Older participants had a higher median number of concurrent health conditions compared with younger participants (4 versus 2; p<0.001). Common comorbidities included mental health conditions (42% of sample), muscle pain (33%), joint pain (30%), high cholesterol (28%), addiction (26%), and neurocognitive decline (22%). A greater proportion of older participants reported living with joint pain, muscle pain, elevated triglycerides, high blood pressure, high cholesterol, bone and joint disorders, cardiovascular disease, neurocognitive decline, mental health condition, COPD, neuropathy, frailty, and liver disease (p<0.05). Compared with younger participants, older participants had an earlier mean year of diagnosis, were working less for pay, and had lower maladaptive coping and lower stigma scores (p<0.01).

**CONCLUSIONS:** In this sample, older adults with HIV reported living with a greater number of comorbidities compared with younger adults. The relationship between comorbidities and extrinsic and intrinsic contextual factors among adults with HIV needs further study.

**O068**

**UNIVERSAL SCREENING FOR CHILDHOOD ABUSE: PREVALENCE AND CLINICAL IMPACT IN AN ADULT HIV-POSITIVE POPULATION**

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**INTRODUCTION:** Adult survivorship of childhood abuse (CA) is increasingly being recognized as been associated with deleterious psychosocial and health outcomes. The epidemiology and clinical associations of CA within the HIV community is not clear.

**METHODS:** All patients attending a medical appointment for HIV in Southern Alberta between May 2009 and August 2014 were screened for domestic violence, including specifically for CA (abuse in the home before 16 years of age). Patients were offered same-day social work consultation and referral to community or in-house services as required. Clinical data was obtained through usual care and extracted from a database. Poisson regression adjusted for age, gender, sexual orientation, self-reported ethnicity, time since HIV diagnosis, and HIV risk factor.

**RESULTS:** 320 (19.4%) of 1,653 patients screened disclosed a history of CA. Prevalence varied by ethnicity: Aboriginal (50.8%, n=124), white (22.1%, n=993), other (13.5%, n=148), black (4.2%, n=379), P<0.001. Gay/bisexual vs. heterosexual (adjusted odds ratio=2.5, 1.1-5.7) and female vs. male (1.7, 1.1-2.5) predicted a history of CA. Depression (2.3,

1.7-3.1), anxiety disorders (2.2, 1.6-3.2), previous psychiatry consultation (1.7, 1.2-2.5), and suicide attempts (1.8, 1.1-2.9) were more frequent among CA survivors. CA survivors were more likely to report intimate partner violence as an adult (4.9, 3.6-6.5), insecure housing (2.2, 1.3-3.8), and smoking (1.7, 1.2-2.4). Health-related quality of life was also lower: AOR=2.2 (1.5-3.3) for poor/fair vs. good/excellent.

HIV-related hospitalizations after HIV diagnosis were more frequent among CA survivors (1.4, 1.1-1.9). This is despite the fact that survivors of childhood abuse were less likely to have had a delayed HIV diagnosis, with a CD4 count <200 cells/mm<sup>3</sup> (0.6, 0.4-0.9).

**CONCLUSIONS:** A history of CA is common among HIV-positive adult patients and is associated with poor social, psychiatric, and HIV outcomes. Efforts to address the sequelae of CA could lead to improved wellbeing in this population.

**Epidemiology and Public Health: Prevention or Diagnosis of New Infections in Youth**

**Épidémiologie et santé publique : Prévention ou diagnostic des nouvelles infections chez les jeunes**

**O069**

**FROM ADOLESCENCE TO YOUNG ADULT LIFE: THE EXPLOSIVE TRANSFORMATION OF NEW HIV INFECTION CASES AT THAT AGE**

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**RATIONAL:** In Quebec, the proportion of new HIV diagnostics amongst 0-35 years old youth has continuously increased, from 33% (75/230) in 2002 to 45% (160/358) in 2013. For young teens, HIV may seem a distant problematic. As they get into their 20's, the number of infected peers dramatically increases. Goal is to document new diagnosis numbers by age (20-35 years old) and inform new HIV prevention strategies towards youth.

**METHODS:** Distributions of HIV data from surveillance program in Quebec were calculated based on new HIV diagnosis absolute numbers stratified per age and sex. Distributions were smoothed using average number of diagnostics over the last twelve years.

**RESULTS:** The average of new diagnostic numbers are shaped as geometric progression for both sexes from 20 to 30 years old. For males and females respectively, average new diagnostics per year are 0.17 and 0.17 diagnostics at 15 years old; 2.25 and 1.08 at 20 years old; 9.08 and 3.17 at 25; 11.00 and 4.08 at 30. After 30 years of age, the average number of new diagnosis remains stable from 31 to 35 years old (13.48 for males, 4.48 for females in average).

**DISCUSSION:** Teenage years are important for socialization and to shape adult life style, sex and drug practices. Developing and keeping safe practices need to be integrated while they explore new sexual practices. Although prevention tools have been developed to reach youth and respond to prevention needs regarding HIV infection, these tools may not be fully adapted to the realities and needs of young adults before and as they initiate their sexual life.

The acceleration of new cases between 20 and 30 years old suggests revisiting actual preventive actions regarding youth realities including their structural access to good sexual health conditions (information, condoms, physicians and professional advice being some of them).

## O070

### A CLUSTER-RANDOMIZED CROSS-SECTIONAL SURVEY OF HIV RISK AMONG ADOLESCENTS IN SIERRA LEONE

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**OBJECTIVES:** Adolescents in sub-Saharan Africa represent an identified group with heightened vulnerabilities to HIV/AIDS, particularly in fragile states. Recovering from civil war, Sierra Leoneans have endured egregious human rights abuses, family separation, and politico-economic instability – all factors known to influence sexual risk. This analysis sought to examine the role of individual and social-structural factors on sexual risk among adolescents living in Sierra Leone.

**METHODS:** Following extensive community-based collaborations established during an ethnographic research phase, adolescents were recruited through household surveys from 12 villages within the Moyamba and Bombali Districts of Sierra Leone. Generalized estimating equations (GEE) were used to examine factors independently associated with condom use at last sex while controlling for within village clustering using Adjusted Odds Ratios (AOR) and 95% confidence intervals.

**RESULTS:** From a total of 530 adolescents, 212 (40.0%) were sexually active and comprised the analytic sample. The median age was 18 years (interquartile range 17-18), 90 (42.45%) attended school in the last 12-months, 78 (36.79) reported living without a biological parent, 85 (40.10%) were single/double orphans. In the last 12-months, 80 (37.74%) had a pregnancy and 29 (13.68%) had engaged in transactional sex. Only 30 (14.15%) used a condom at last sex. In GEE analyses, living without a biological parent (AOR: 0.37, 95% CI: 0.13-1.08) and recent pregnancy (AOR: 0.16, 95% CI: 0.04-0.55) were negatively associated with condom use. High dwelling quality was positively associated with condom use (AOR: 2.71, 95% CI: 1.28-5.75).

**DISCUSSION:** This study provides data on the prevalence of adolescent sexual risk and the potential role of housing and family connectedness as structural factors influencing adolescent sexual health in Sierra Leone. The results speak to the need for on-going empirical investigations to inform the development of evidence-based programming to mitigate sexual risk and support families, households, and societies to ensure the well being of their adolescents.

## O071

### INVOLVING YOUTH IN HIV/HCV PREVENTION: FINDINGS FROM THE OUR YOUTH, OUR RESPONSE STUDY IN ATLANTIC CANADA

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**INTRODUCTION:** HIV/HCV infections are a persistent concern among youth in the Atlantic Provinces. Despite a strong body of literature on the topic of youth engagement, youth are still often left out of HIV/HCV policy and program development. Understanding how programmers and policymakers can increase collaboration with youth was a major driving force behind this project.

**METHODS:** Our Youth, Our Response was a three-year study that explored HIV/HCV prevention in the Atlantic Provinces, with the goal of developing evidence-based recommendations for policies and programs serving youth aged 15-24. Year 1 consisted of a policy scan of HIV/HCV and youth-related documents; year 2 included in-depth interviews with key informants from health, education, community, and corrections; and year 3 utilized focus group discussions with youth and youth-serving organizations. Using a thematic analysis approach, a multidisciplinary team analyzed the study transcripts.

**RESULTS:** Consultation and collaboration with young people to determine what HIV/HCV prevention approaches they need, how they wish to be engaged, and what formats will capture their interests must be a priority for all organizations providing youth services. Nevertheless, youth engagement remains low in the region. Organizations face difficulties recruiting and retaining youth, particularly youth from LGBTQ populations, youth

from Indigenous communities, street-involved youth, and young people who use drugs. Potential strategies identified by participants for promoting youth engagement include: the provision of dedicated funding to support youth partnerships, capacity building with organizations and youth to support collaboration, and establishing a standing commitment to solicit youth input. Programs should focus on providing age-appropriate and youth-friendly outlets for inclusion, such as arts-based projects, peer mentorships, and social media or internet-based programs.

**CONCLUSIONS:** Increasing youth engagement in the development and implementation of HIV/HCV prevention policies and programs can increase their reach and uptake leading to services that better reflect the needs and preferences of youth.

## O072

### THE PRELIMINARY EFFECTIVENESS OF AN AFFIRMATIVE COPING SKILLS INTERVENTION TO REDUCE HIV/AIDS RISK FOR SEXUAL AND GENDER MINORITY YOUTH: RESULTS OF THE AFFIRM OPEN PILOT FEASIBILITY STUDY

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<sup>1</sup>Toronto, ON; <sup>2</sup>Miami, FL, USA

**BACKGROUND:** Sexual and gender minority youth (SGMY) are vulnerable to HIV because of mental and sexual health risks. Yet, there is a lack of evidence-informed interventions that are grounded in contemporary service delivery. This study examined the preliminary effectiveness of a cognitive-behavioral affirmative coping skills training (AFFIRM) to increase sexual self-efficacy and reduce depression among SGMY in Toronto.

**METHODS:** An open pilot study using a pre-post design was used to determine preliminary feasibility and acceptability. Following purposive and venue sampling, a pilot implementation of the 16 hour AFFIRM group intervention (August 2014) was delivered in a two day workshop format. SMGY completed reliable measures of health risk sexual behaviors, depression, sexual self-efficacy and coping at three time points. Repeated measures linear mixed modeling was used for analysis.

**FINDINGS:** SGMY (n=30) between the ages of 15 – 18 completed AFFIRM. Participant identities (all non-mutually exclusive) included: sexual orientation (pansexual 29%; lesbian 25%; queer 21%; bisexual 18%; gay 11%; questioning 11%); gender identity (female 57%; non-binary 21%; male 18%; trans\* 7%; two-spirit 4%); and racial/ethnic identity (Caucasian 59%; Asian 29%; Black 25%; Aboriginal 18%; Mixed 13%; Latino 7%). Seventy percent reported one immigrant parent. Risks included anxiety (79%); substance use (62%); homelessness (44%) and suicide attempts (31%).

**RESULTS:** AFFIRM participants experienced a significant reduction in depression scores on the Becks Depression Inventory-II (B=5.21; P<0.01). Significant improvements in sexual self-efficacy (B=1.56; P<0.05) and reflective coping (B=1.01; P<0.05) were found. Changes in knowledge or attitudes were not indicated.

**CONCLUSION:** This study is the first to demonstrate the potential of an affirmative intervention to address sexual self-efficacy and depression for a community sample of SGMY. These results indicate the utility of a community-engaged, inclusive model of HIV prevention for SGMY and warrant a larger study to determine AFFIRM's effectiveness.

## O073

### HOW DO 'PUBLIC' VALUES INFLUENCE HIV TESTING PRACTICES AMONG YOUNG MEN? A CRITICAL DISCOURSE ANALYSIS

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Vancouver, BC

**BACKGROUND:** Despite the epidemiological and clinical rationale to expanding HIV testing, some have expressed concern that public health practices to enhance testing uptake may not sufficiently align with the values and principles from bioethics that emphasize patient autonomy and the limits of State paternalism. Alternatively, emerging theoretical work has argued that public health interventions ought to be subject to

normative inquiry that considers ‘public’ values, including relational concepts such as solidarity, reciprocity and health equity. As yet, however, the extent to which ‘public’ values influence the ‘autonomous’ decisions of the public remains largely unexplored.

**METHODS:** Drawing on qualitative interviews with 50 young men (ages 18–24) in Vancouver, Canada, this study employs a critical discourse analysis to examine participants’ decisions and motivations to voluntarily access HIV testing and/or to accept a routine HIV test offer.

**FINDINGS:** The findings reveal that, while some young men position the individual-level act of testing as constituting relational and ‘public’ value, others choose to test for predominately individually-oriented reasons. Within a sub-set of interviews, a transactional discourse emerged in which the decision to test features an arrangement of ‘giving and receiving’ – between men and their clinicians and/or their sex partner(s). Another set of discourses related to notions of collective solidarity emphasize considerations of justice and positions testing as a ‘public’ act – an act that does not feature direct obligations but remains deeply ‘social’ and is implicated within collective efforts to advance justice (e.g., eliminate HIV transmission). Lastly, ‘individualistic’ discourses also emerged, focusing on individual-level considerations, with less concern for the broader public ‘good’.

**DISCUSSION:** These findings underscore how normative dimensions pertaining to men’s HIV testing practices are dialectically interrelated with the broader social and structural influences on individual and collective HIV-related behaviour, thereby suggesting a need to advance an explicit empirical-normative research agenda related to research regarding HIV-related health behaviour.

#### O074

##### **SEX DISPARITIES IN ACCESS TO STBBI TESTING: CUES FROM THE PIXEL STUDY, A PORTRAIT OF YOUNG ADULTS SEXUAL HEALTH IN QUEBEC, CANADA (2013–2014)**

**Mathieu-Chartier, Sara; Lambert, Gilles; Goggin, Patricia; Otis, Joanne**

**Montreal, QC**

**BACKGROUND:** Young adults are at significant risk for sexually transmissible and blood-borne infections (STBBI) and may not perceive their need to seek for STBBI testing services or may face barriers to access those services. This study aims to describe key barriers to STBBI testing specific to sex among young adults.

**METHODS:** PIXEL is a cross-sectional and descriptive study targeting 17–25 years old. It combines observations from self-administered questionnaires and biological samples. Between 2013 and 2014, participants were recruited according to a stratified multistage sample plan based on 3 geographical entities (Montreal, Quebec and periphery regions) and a variety of school settings (ex. vocational schools, colleges, universities). Using Levesque & al. (2013) Access to health care framework, barriers to STBBI testing were explored with Chi-square tests.

**RESULTS:** In the subgroup of 17 to 20 years old, 781 sexually active women and 508 sexually active men answered PIXEL questionnaire. Proportion of those participants who reported having sought for STBBI testing in the past 12 months was significantly lower among men than women (men: 14.5%; women: 33.5%;  $p < 0.00$ ). Among those participants, the most frequent barriers related to their ability to seek and reach for STBBI testing services were: “Not having enough time” (men: 40%; women: 27.5%;  $p < 0.05$ ), “Being scared of the results” (men: 38.8%; women: 40.9%;  $p = 0.76$ ), “Not knowing where to go” (men: 32.4%; women: 12.7%;  $p < 0.00$ ), “Having difficulties to get an appointment” (men: 25.0% women: 29.6%;  $p = 0.47$ ), “Being afraid people would find out” (men: 25.4%; women: 16.3%;  $p = 0.08$ ) and “Feeling uncomfortable having to talk with a nurse/doctor about sexuality” (men: 25.0%; women: 21.1%;  $p = 0.49$ ).

**CONCLUSION:** Results illustrate certain disparities between 17 to 20 years old men and women access to STBBI testing services. Through the Access to health care framework (Levesque & al., 2013), these findings provide guidance for prevention programs.

## Social Sciences: Everyday Actualities of Living with HIV

### Sciences sociales : Vivre avec le VIH ... au quotidien

#### O075

##### **LIVING THROUGH THE TRANSITION: THE IMPACT OF COMPLEX CARE NEEDS ON THE HOSPITAL TO COMMUNITY TRANSITION**

**Brennan, David J; McWatt, Simone; O’Leary, Bill; Chan-Carusone, Soo; Stewart, Ann; Craig, Shelley**  
**Toronto, ON**

**BACKGROUND:** For People living with HIV/AIDS (PHAs) who experience instability related to social determinants of health, time in hospital can be a respite from the chaos of their lives. The structure of hospital can provide escape from precarious housing, chaotic substance use, lack of social support, stigma, and poverty. The transition period following a hospital discharge can be a high-stress time which is not often discussed by hospital staff nor well captured in research studies.

**METHODS:** A qualitative case study approach was utilized to explore factors and multiple perspectives that impact the hospital discharge transition period for PHAs. Semi-structured interviews with nine clients being discharged from in-patient care at Casey House (a sub-acute care HIV hospital) at four timepoints (approximately one week pre-discharge to one month post-discharge) were conducted and data were abstracted from hospital charts and discharge plans. Data were analyzed using qualitative thematic analysis across time and cases to capture the lived experience at each timepoint.

**RESULTS:** The level of complexity of a client’s life affected the transition from hospital to community. Although the client and care team named HIV-related health priorities in the discharge plan, often these were not the priorities of the client post-discharge. Clients, upon discharge, often returned to chaotic living situations that promoted the poor health outcomes which had led to their recent hospitalization: a cycle demonstrated by the lived experience of all participants in this study.

**CONCLUSIONS:** The lived experience of PHAs during the transition period following hospitalization demonstrated that attempts to prioritize medical concerns, such as adherence, became secondary to client priorities related to daily living needs and other social determinants of health. The complexity and instability of the person’s life should be incorporated into hospital admission goals and discharge plan, thereby mitigating challenges which adversely impact their health and care needs.

#### O076

##### **ETHICAL ISSUES AND CHANGES IN THE PROVISION OF HEALTHCARE TO PEOPLE LIVING WITH HIV: NOTES FROM AN INSTITUTIONAL ETHNOGRAPHY OF HIV HEALTHCARE IN NEWFOUNDLAND AND LABRADOR**

**Greenspan, Nicole R; Marshall, Zack; Allison, Jill; Kaposy, Chris**  
**Toronto, ON**

As people living with HIV live longer lives, the healthcare they require is changing. The health system in Canada was originally organized around specialists physicians providing HIV medical care, but it must adapt to treating HIV as a complex chronic condition that requires co-management and integration across a variety of care providers. Shifting treatment protocols can have profound but unforeseen consequences on the experience of illness, as well as other aspects of life for people living with HIV. As part of a five-year, multi-centre, multi-provincial program of linked research-to-action projects, we are conducting an institutional ethnography of healthcare for people living with HIV at clinics in Newfoundland and Labrador (NL), Manitoba and Ontario. Our institutional ethnography involves interviews with people living with HIV and healthcare providers, observation of clinical encounters and text analysis of medical records. This presentation will describe our study design and present preliminary



findings from our first site in NL. The organization of HIV healthcare in NL must take into account the geographic dispersion of people living with HIV, issues related to patient confidentiality and stigma, and the psychosocial needs of the diversity of people living with HIV in the province within a national context of heightened criminalization. Ethical issues that arise in providing healthcare to people living with HIV in this province will be explored.

Findings will provide new insights into the ethical concerns raised in the changing domain of HIV healthcare from the perspectives of providers and people living with HIV. As a follow-up to this project we intend to develop a toolkit for providers to help navigate ethical issues arising in HIV practice.

## O077

### IMPACT OF FOOD SECURITY ON HEALTH OUTCOMES AMONG PEOPLE LIVING WITH HIV IN ONTARIO

**Globerman, Jason; Jose, Murray; Kennedy, Rick; Shi, Maggie; Bekele, Tsegaye; Rourke, Sean B**  
Toronto, ON

**BACKGROUND:** It is estimated that 1 in 8 Canadian households experience food insecurity. People living with HIV face greater challenges with food security due to lower household incomes, poorer health outcomes and experiences of stigma and discrimination. The primary purpose of this study was to understand the existence of food insecurity among Ontarians living with HIV and the impact this has on their daily lives.

**METHODS:** Participants were recruited from community-based agencies throughout Ontario. Questionnaires were administered by Peer Research Associates. Food security was assessed using Canada's Household Food Security Survey Module. Sociodemographic data and information on substance use, depressive symptoms and measures of physical and mental health-related quality of life were collected. Descriptive statistics were obtained for variables of interest. Univariate regression analyses were conducted to identify variables associated with food insecurity. Variables significant ( $p < 0.10$ ) in univariate analyses were incorporated into multivariate linear regression models.

**RESULTS:** 649 people living with HIV were recruited. Mean age was 45 years. Two-thirds of participants were men. Half were heterosexual. Sixty-nine percent experienced food insecurity. Non-Caucasian ethnicity (AOR: 1.76, 95% CI: 1.11-2.81), living outside the GTA (AOR: 1.62, 95% CI: 1.03-2.54), unemployment (AOR: 2.18, 95% CI: 1.27-3.76), household income less than \$20,000 (AOR: 2.11, 95% CI: 1.29-3.46), depression (AOR: 2.24, 95% CI: 1.36-3.60), substance use (AOR: 2.14, 95% CI: 1.30-3.51), injection drug use (AOR: 2.19, 95% CI: 1.30-3.70) and higher levels of stigma (AOR: 1.04, 95% CI: 1.02-1.06) were associated with food insecurity.

**CONCLUSIONS:** Compared to the general Canadian population, people living with HIV are significantly more likely to experience food insecurity. Our findings highlight the importance of developing holistic programs that address the underlying causes of food insecurity while building stronger, broader community partnerships to prevent food insecurity among people living with HIV.

## O078

### STIGMATIZATION AND HIV DISCLOSURE TO SIGNIFICANT OTHERS AMONG YOUTH WITH PERINATALLY ACQUIRED HIV: A QUALITATIVE EXPLORATION

**Proulx-Boucher, Karène<sup>1</sup>; Blais, Martin<sup>1</sup>; Fernet, Mylène<sup>1</sup>; Lévy, Joseph J<sup>1</sup>; Otis, Joanne<sup>1</sup>; Lapointe, Normand<sup>1</sup>; Samson, Johanne<sup>1</sup>; Morin, Guylaine<sup>1</sup>; Thériault, Jocelyne<sup>1</sup>; Trottier, Germain<sup>2</sup>**

<sup>1</sup>Montréal; <sup>2</sup>Québec, QC

**OBJECTIVE:** During adolescence and young adulthood, youth with perinatally acquired HIV (PAHIV) face the question of disclosing their HIV status to significant others, such as peers and romantic partners. The objective of this study is to explore the management of HIV disclosure among youth with PAHIV.

**METHODOLOGY:** Semi-structured interviews were performed with 18 youths with PAHIV (aged 13-22) recruited through the CHU Sainte-Justine (Montreal), using a qualitative typological analysis.

**RESULTS:** Three types of disclosure were identified: 1) Public disclosure where the vast majority of family, friends and community members are aware of the youth's status. These youth feel well supported, perceive less stigmatization and do not feel like they are holding a secret. 2) Conditional disclosure where youth set conditions, such as trust or being in a serious relationships before disclosing their HIV status. Youth carefully select the people to whom they disclose, and disclosure is a multi-stage process. 3) Inconceivable disclosure where youth are overwhelmed with fear of stigmatization and cannot imagine disclosing their status to anyone. Fear of rejection and discrimination are dominant. These youth set unrealistic conditions to their disclosure, such as getting married, having children, or being cured. These conditions confine them to secrecy and constant fear of their HIV-status being discovered.

**DISCUSSION:** Anticipated and perceived stigma play a crucial role in management of HIV-disclosure. Implications of inconceivable disclosure issues for youth with PAHIV and their romantic and sexual partners should be taken into account for intervention. A peer intervention should be planned to help those who feel overwhelmed by stigma to enhance empowerment and decision-making skills about HIV-disclosure.

## O079

### SHAPING THE GAY MALE SUBJECT IN THE AGE OF HIV/AIDS: AN EXAMINATION OF ACTIVISTS' PERSPECTIVES ON HIV DISCOURSE IN NOVA SCOTIA

**Numer, Matthew; Gahagan, Jacqueline**  
Halifax, NS

**BACKGROUND:** Since the beginning of the gay liberation movement in North America, gay identities have been contested as much as they have been employed as a tactic of political resistance. HIV/AIDS has a profound impact on the identities and communities associated with gay men. At the outset of the outbreak, HIV/AIDS created a focal point around which gay communities could rally. Despite its devastating impacts, HIV/AIDS began to shape and render visible the conception of the gay male subject. Today, HIV has been inextricably woven into the subjectivities of gay men.

**METHODS:** This paper will discuss the findings of a qualitative research project in Nova Scotia aimed at examining the perspectives of HIV/AIDS activists on complex ways in which the disease influenced how we have come to know and understand gay men. To investigate these issues, 17 HIV/AIDS activists were interviewed about their experiential connection to the HIV/AIDS movement in Nova Scotia.

**FINDINGS:** Employing a Foucauldian theoretical framework and a discourse analysis to these data, this research finds that HIV has given rise to sanctions against some sexual acts, the provision of instructions for ways to act on the risks and responsibilities entailed in sexual relations, and has also become the site of resistance to these very instructions often reinforced by public health HIV prevention rhetoric. The perspectives of HIV/AIDS activists provides insight into how this shaping of the gay male subject enters the decision-making processes for HIV policies and programming, further contributing to the discursive field of gay men's subjectivities.

**CONCLUSION:** Considering the ways in which HIV prevention and stigma messaging has influenced gay men's subjectivities can have significant implications for future public health and health promotion efforts, particularly in local contexts such as Nova Scotia.

## O080

### EPISODIC DISABILITY AMONG WOMEN AND MEN LIVING WITH HIV ON ART IN LUSAKA, ZAMBIA

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<sup>1</sup>Toronto, ON; <sup>2</sup>Lusaka, Zambia; <sup>3</sup>London, United Kingdom;

<sup>4</sup>Hamilton, ON; <sup>5</sup>Durban, South Africa; <sup>6</sup>Harare, Zimbabwe

**RATIONALE/BACKGROUND:** The concept of "episodic disability" (i.e., fluctuations of wellness, illness and disablement) was developed in Canada to describe the experience of PHAs in the era of ART. Framing challenges in terms of "episodic disability" contributed to health care and employment policies and practices in Canada. However, episodic disability



ity has not been explored in Sub-Saharan Africa despite increased access to ART in the region.

**OBJECTIVE:** To describe experiences of episodic disability among women and men living with HIV in Lusaka, Zambia.

**METHODS:** “Sepo II” is a qualitative longitudinal study involving in-depth, semi-structured interviews approximately 6 months apart with participants from public and private clinics in Lusaka, Zambia. Thirty-five participants were purposively recruited for variability by gender (17 men, 18 women), time on treatment (1-13 years), and SES. An interpretive analysis was conducted of the first two waves of interviews using the collaborative “DEPICT” method (Flicker & Nixon, 2014). The study was guided by the WHO “International Classification of Functioning, Disability and Health” (ICF), and O’Brien’s “Episodic Disability Framework”. **RESULTS:** Participants did not perceive their health-related experiences as episodic. However, participants readily described fluctuations in their impairments, activity limitations and participant restrictions (i.e., disablement described in WHO ICF) in the time between wave 1 to wave 2 interviews. Four types of changes in disability were described: improvements, complete resolution, worsening, and new onset. Changes were greatest at the level of impairment.

**CONCLUSION:** This is the first study to demonstrate the experience of episodic disability among women and men living with HIV in a Sub-Saharan African context. Findings point to shortcomings in the dominant model of HIV care centred on ART, suggesting that services and policies in settings like Zambia also need to address the episodic health- and life-related impacts of living longer with HIV.

## Basic Sciences: HIV Molecular Epidemiology, Evolution and Vaccines

## Sciences fondamentales : Épidémiologie moléculaire du VIH, évolution et vaccins

### O081

#### DIFFERENTIAL HCV EVOLUTION RATE AND VIRAL LOAD DYNAMICS DURING PREGNANCY ARE ASSOCIATED WITH HCV/HIV-1 COINFECTION

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<sup>1</sup>Montreal, QC; <sup>2</sup>Vancouver, BC

**BACKGROUND:** Coinfection with hepatitis C virus (HCV) and HIV-1 is common and worsens the prognosis of hepatitis C. HCV exists as quasispecies, and the bulk of its genetic variability is located within hypervariable regions of the E2 envelope glycoprotein. During pregnancy, selective pressures exerted on HCV target solvent-exposed regions of E2, suggesting the involvement of humoral immunity. The objectives of the study were to examine potential associations between HCV quasispecies evolution and maternal immune responses, and to characterize the impact of coinfection on these processes.

**METHODS:** Sera from HCV-infected women (n=17) or women coinfecting with HCV and HIV-1 (n=20) were collected during the first, second and third trimesters of pregnancy and in the early postpartum period. HCV viral RNA was extracted, amplified by RT-PCR, and sequenced on a Roche 454 GS-FLX next-generation sequencing system. Files were subjected to a k-mer based error correction algorithm prior to calculation of the frequencies of HVR1 amino acids variants. Variant spectra obtained for each time point were used to calculate UniFrac sample distances, Shannon entropy and Hamming distances. Clinical data were collected to identify potential differences between mono-infected and coinfecting subjects.

**RESULTS:** Analysis of UniFrac distances revealed a faster rate of HCV quasispecies evolution in the mono-infected group compared to coinfecting subjects (slope of UniFrac distance/time=0.0244 vs 0.0095). HCV viral load decreased following childbirth in mono-infected women but not in coinfecting subjects (p=0.0485). Lower Shannon entropy values reflecting simpler composition of the variant spectra were associated with increased

risk of mother-to-child HCV transmission in mono-infected women (p=0.0024).

**CONCLUSIONS:** Differential evolution rate and viral load dynamics suggest that maternal immune responses drive HCV evolution during pregnancy and that coinfection with HIV-1 impairs these responses. Low entropy values could reflect the presence of neutralization escape variants and/or high fitness variants that are more likely to be transmitted from the mother to her child.

### O082

#### PHYLODYNAMIC ANALYSIS OF THE HIV EPIDEMIC WITHIN CANADA

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<sup>1</sup>Vancouver, BC; <sup>2</sup>Sudbury, ON; <sup>3</sup>Montreal, QC; <sup>4</sup>Toronto, ON;

<sup>5</sup>Calgary, BC; <sup>6</sup>Regina, SK; <sup>7</sup>Burnaby, BC; <sup>8</sup>Ottawa, ON;

<sup>9</sup>St John's, NL

The genetic diversification of HIV heralds significant challenges for the treatment and management of patients in Canada. Since HIV accumulates genetic changes on a contemporary time scale, phylogenetic tools can be used to reconstruct the recent history of HIV epidemics and to characterize the processes that have shaped the epidemic and the circulating HIV variants. In this study we integrate phylogenetic analyses of HIV sequence data with clinical attribute data from across Canada to identify the processes structuring the nationwide epidemic.

We assembled 39,477 anonymized HIV protease and reverse transcriptase sequences sampled from 15,749 unique patients from 5 provinces (British Columbia, Alberta, Saskatchewan, Ontario, and Quebec) within Canada between 1995 and 2014. Our core dataset consists of sequences sampled from patients in the Canadian Observational Cohort (CANOC) supplemented with data from clinics not currently included in CANOC. Sequences were aligned using MAFFT v.7.54b and visually inspected using AliView v.1.15. Codons associated with known drug resistance mutations were censored from the alignment prior to tree inference. We inferred a distribution of 1000 phylogenetic trees using FastTree2 under a general time reversible model of molecular evolution. We rooted the resulting phylogenetic trees under a molecular clock using a modified version of Path-O-Gen; node heights were re-estimated using a non-parametric rate smoothing method.

We used these time-scaled phylogenies reconstructed from the sequence data to quantify HIV incidence and prevalence in the Canadian epidemic with phylogenetic estimators. Results revealed expected patterns of within province diversification along local transmission networks, but also a surprising amount of interprovincial mixing. We observed substantial variation among provinces in the proportion of non-subtype B infections (P<0.05).

Overall, our analyses reveal temporal changes in the processes shaping the Canadian HIV epidemic that highlight the impacts of past public health and clinical interventions. Our study represents the first integrated, comprehensive nationwide evaluation of the HIV epidemic in Canada.

### O083

#### IMPACT OF HLA-B\*13 ESCAPE MUTATIONS ON HIV-1 REPLICATION CAPACITY AND NEF-MEDIATED CD4 AND HLA CLASS I DOWNREGULATION FUNCTION

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<sup>1</sup>Burnaby, BC; <sup>2</sup>Barcelona, Spain; <sup>3</sup>Vancouver, BC

**BACKGROUND:** The protective HLA-B\*13 allele selects escape mutations across HIV-1, but their effects on viral replication capacity (RC) and protein functions remain incompletely understood. We evaluated the

impact of 10 described HLA-B\*13 escape mutations located in Gag, Pol and Nef on viral RC. We also assessed the impact of Nef mutations on CD4 and HLA class I-downregulation, and the latter's consequence for recognition of virus-infected cells by epitope-specific T-cells.

**METHODS:** HLA-B\*13 escape mutations in Gag (A146S, I147L, K436R, I437L), Pol (Protease-L63S; RT-Q334N, T369A, K374R) and Nef (E24Q, Q107R) were engineered alone and in biologically relevant combinations into HIV-1NL4-3. Viral RC was determined using a GFP-reporter T-cell assay. Nef-mediated CD4 and HLA-A\*02 downregulation was measured by flow cytometry; recognition of infected-target cells by HIV-1-specific effector cells was assessed via co-culture with an NFAT-driven luciferase reporter T-cell line specific for the A\*02-restricted Gag-FK10 peptide.

**RESULTS:** Of all mutations tested, only Gag I437L showed 14% reduced RC, alone and in combination with A146S and I147L. This defect was rescued to wild-type levels by K436R. A putative novel B\*13 epitope was identified in p24Gag (GQMVHQAI,140-147). Single Nef mutations exhibited no effect on CD4 or HLA-A\*02-downregulation; however, the double mutant was impaired for the latter function [NL4-3, E24Q, Q107R (100%) > E24Q/Q107R (31%) > M20ANefNL4-3 (8%)]. Correspondingly, luciferase signal emitted by HIV-1-specific effector cells upon co-culture with HIV-1E24Q/Q107R infected-target cells was 2-fold higher than for cells infected with NL4-3 or single Nef mutants.

**CONCLUSION:** A minority of HLA-B\*13-driven escape mutations modestly dampen HIV-1 RC or Nef function, which could contribute in part to B\*13-associated protection from disease progression. The observation that a naturally-occurring (albeit rare; 4%) Nef double mutation impaired HLA downregulation and enhanced recognition of infected cells by HIV-1-specific T-cells suggests a novel escape-associated defect that ironically dampens a key viral immune evasion strategy.

## O084

### IMMUNE-MEDIATED ADAPTATION OF HIV-1 POLYMERASE SEQUENCES IN NORTH AMERICA, 1979-PRESENT

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**BACKGROUND:** HLA-driven HIV-1 immune escape mutations that persist following transmission could gradually spread in the viral population, compromising host antiviral immunity over time. We investigate the extent and correlates of escape mutation accumulation in HIV-1 Polymerase (Pol) in North America from 1979-present.

**METHODS:** HIV-1 Pol and HLA class I genotyping was performed on 338 Historic (1979-1989) and 278 Modern (2001- 2011) specimens from Boston, New York, San Francisco and Vancouver. Ancestral reconstruction of the HIV-1 epidemic founder sequence was performed using BEAST and HyPhy. HLA-associated polymorphisms were defined according to published lists.

**RESULTS:** The estimated HIV-1 epidemic founder sequence dated to ~1969 and was near-identical to the modern subtype B consensus, suggesting no selective sweeps have occurred since this time. However, pairwise sequence diversity of modern HIV-1 sequences was ~twofold greater than historic sequences, with diversification predominating at known HLA-associated sites ( $p < 0.0002$ ).  $N = 20$  published HLA-associated escape mutations were investigated for potential spread over time. Overall, their median frequencies in individuals not expressing the restricting HLA were 6.6% vs 16.8% in the historic and modern eras respectively ( $p = 0.0004$ ). Escape mutation frequencies in reconstructed pre-1979 ancestral sequences were also consistent with gradual spread ( $p < 0.01$ ). Escape mutations restricted by protective HLA alleles appear to have increased to the greatest relative extent over time ( $p < 0.05$ ). Despite these increases, many escape mutations (eg: B\*51-associated RT-I135T) remained consistent in frequency throughout the eras. Moreover, at the whole-sequence level, the median extent of adaptation of the typical circulating HIV-1 Pol sequence to the average North American host

remains 0%, indicating the risk of acquiring HIV-1 immune escape mutations at transmission remains low.

**CONCLUSIONS:** Immune escape mutations in HIV-1 Pol have spread significantly in the population since the genesis of the North American epidemic, however these changes are unlikely to herald immediate consequences for host immunity on this continent.

## O085

### DIFFERENCES IN ENVELOPE GLYCAN CONTENT OF HIV-1 CLONES INFLUENCES TRANSMISSION FITNESS

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**BACKGROUND:** During primary mucosal HIV-1 infection, only one or a limited number of infectious HIV-1 clones are transmitted from the donor to the recipient. Only little is known about the role phenotypic properties of the transmitted virus play in the genetic bottleneck selection process. Therefore we analyzed possible genotypic and phenotypic differences that may influence transmission between early and chronic HIV-1.

**METHODS:** Using deep sequencing we compared the genetic diversity of HIV-1 isolated from the female genital tract to viruses isolated from blood. We further constructed chimeric viruses from envelope genes of early and chronic isolates and compared their pathogenic and transmission fitness measured by competitions in PBMCs, T cells and macrophages or in ex vivo human mucosal explant tissue respectively. We further evaluated mechanisms such as receptor affinity, entry efficiency or envelope glycosylation that might control pathogenic and transmission fitness.

**RESULTS:** Sequence analysis revealed that early HIV-1 isolates in the female genital tract had high genetic diversity while isolates from matched blood were genetically homogenous. We found that early and chronic isolates showed similar entry kinetics and replication fitness in PBMCs, T cells and macrophages. In contrast we observed that early virus clones penetrated human tissue and subsequently established infection of T cells more efficient than chronic HIV-1, which resided and replicated mainly in the tissue. Furthermore early HIV-1 isolates from the female genital tract had a higher number of N-linked glycans compared to virions from the blood.

**CONCLUSION:** The majority of heterosexually transmitted HIV-1 appears trapped in mucosal tissue, possibly due to high levels of soluble mannose binding lectins in tissue and lectins expressed on epithelial cells. As a result HIV-1 with fewer N-linked glycans is passively selected for transmission across mucosal tissues due to reduced lectin binding.

## O086

### INDUCING IMMUNE QUIESCENCE AS A NEW AVENUE TO PREVENT HIV INFECTION

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**INTRODUCTION:** In Kenya, HIV incidence among female sex worker (FSWs) is five times higher than the general population. However, despite being at high risk of HIV infection a small group of FSW remain uninfected. Over the years, we have observed that HIV exposed seronegative FSW have a unique immune phenotype called Immune Quiescence (IQ). In this model, decreased levels of baseline T cell activation limit the number of target cells and prevent HIV infection. Interestingly, CAPRISA 004 showed that participants with prior immune activation had a higher likelihood of becoming HIV infected. We hypothesised that hydroxy-chloroquine (HCQ) and/or aspirin can mimic the IQ phenotype and help preventing HIV infection.

**METHODS:** Non-FSW HIV uninfected women ( $n = 105$ ) from Kenya were enrolled and followed for three months. At month 1, systemic/mucosal baseline immune activation was assessed by flow cytometry. Participants were randomized into two arms (HCQ 200 mg/day or aspirin 81 mg/day) and followed for a 2 months period to assess changes in T cell immune activation (systemic and mucosal).

**RESULTS/DISCUSSION:** Preliminary data are indicating that both HCQ and aspirin can reduce T cell activation. A significant decrease of CD95 and CCR5 expression on CD4+ T cells ( $p < 0.0001$  and  $p = 0.01$

respectively) in the HCQ arm was observed in the blood and a reduction of the percentage of CD4<sup>+</sup>C69<sup>+</sup> (p=0.01) and CD4<sup>+</sup>CCR5<sup>+</sup> (p=0.03) T cells was observed in the aspirin arm. Analysis of the mucosal samples is currently ongoing.

**CONCLUSION:** The ability to modulate mucosal lymphocyte activation could represent a new avenue to prevent HIV infection.

## O087

### USING A HUMANIZED MOUSE MODEL TO UNDERSTAND SEXUAL TRANSMISSION OF HIV IN THE FEMALE GENITAL TRACT

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Clinical and epidemiological studies have shown correlation between hormonal status of women and their susceptibility to HIV, but this has been difficult to test experimentally. Humanized mice (Hu-mice), a human-mouse chimera, where an immunocompromised mouse is reconstituted with a human immune system, has become an important pre-clinical tool for HIV studies. We have developed a NOD-RAG2 <sup>-/-</sup> gamma chain <sup>-/-</sup> Hu-mouse to study the hormonal conditions in which intravaginal (IVAG) HIV infection can occur successfully. Hu-mice were infected IVAG at different stages of the reproductive cycle, or following DMPA (a hormonal contraceptive) injection, with 10<sup>7</sup> infectious units/ml of NL4.3 Bal-Env virus and compared to mice infected intraperitoneally (IP) at the same dose. Mice infected IVAG during the diestrus (progesterone-high) stage and IP had high plasma viral loads (6.3x10<sup>4</sup> ± 2.6x10<sup>4</sup> RNA copies/mL) three weeks post-infection, while mice infected during the estrus (estradiol high) stage had no detectable plasma viral load. P24-positive cells and a noticeable decrease in CD3<sup>+</sup> T cells was detected by immunohistochemistry in vaginal tracts of mice successfully infected with HIV. Time course experiments showed that there was a rapid replication of virus locally in the vaginal tract which peaked 1 week post IVAG infection, followed by a steady increase in plasma viral loads 3 and 5 weeks post-infection. DMPA treated mice infected IVAG showed a significant increase in plasma viral loads from 482.9 ± 943.8 RNA copies/mL at 1 week post-infection to 1.6x10<sup>5</sup> ± 4.07x10<sup>4</sup> HIV RNA copies/mL 5 weeks post-infection (p-value = 0.0017), indicating that DMPA treatment may lead to increased viral replication and higher viral set-point. Overall, these studies show that the hormonal conditions may play a critical role in determining susceptibility to IVAG HIV infection and viral replication. The Hu-mouse model will be a useful tool to better understand HIV pathogenesis following sexual transmission.

## O088

### FREM1 INFLUENCES VAGINAL HIV TRANSMISSION BY REGULATING EXPRESSION OF GENES IN INNATE IMMUNE RESPONSE

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**BACKGROUND:** FREM1 was a novel candidate gene in resistance to HIV-1 infection in the Pumwani sex worker cohort. Studies have shown that it can modulate TLR and IL-1R1 regulated inflammatory responses. However, the role of FREM1 in regulating genes in immune response is not clear. We analyzed FREM1 expression in cervico-vaginal tissue of Rhesus macaques during early SIV vaginal infection and its role in vaginal HIV transmission by gene expression analysis of FREM1 expression modified cell lines.

**METHODS:** Immunohistochemistry (IHC) staining was conducted to analyze archived cervicovaginal tissue of Rhesus macaques during early phase of SIVmac251 infection. FREM1 was knocked down in 293F cells and overexpressed in HeLa cells. A custom PCR array consisting 84 genes was used for the gene expression analysis.

**RESULTS:** IHC staining detected high levels of FREM1 in epithelial cells and lamina propria of human ectocervical tissue. FREM1 is expressed in epithelial cells and CD3<sup>+</sup> T-lymphocytes in the vaginal tissue of Rhesus macaques. FREM1 expression was increased in the epithelial

cells and lamina propria of cervicovaginal mucosa days after SIV vaginal inoculation in Rhesus macaque, specifically, in the inflammatory areas where the cellular infiltrations were apparent. Knocking down FREM1 in 293F cells increased the expressions of 14 genes including genes regulating cell cycle, transcription/transcription factors, TLR1 and TLR3. Whereas, the expression of 25 genes was decreased, including IL-1α and IL-1β, the genes are important in regulating immune and inflammatory response to infections. Increasing FREM1 expression in HeLa cells up-regulated the expression of 17 genes, including genes regulating transcription, expression, cell cycle, response to stress, extracellular matrix integrity and cell migration. Whereas the expression of 6 genes including STAT1, FOXO1, IRF1, NOS2, MMP2 and MMP13 were down regulated.

**CONCLUSION:** Our study showed that FREM1 is important in innate immune response to HIV vaginal infections.

## Clinical Sciences: Children and Pregnancy

### Sciences cliniques : Enfants et grossesse

## O089

### USE OF COMBINATION NEONATAL POST-EXPOSURE PROPHYLAXIS FOR PREVENTION OF VERTICAL TRANSMISSION OF HIV IN THE CANADIAN PERINATAL HIV SURVEILLANCE PROGRAM (CPHSP) 1997-2013

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**BACKGROUND:** Combination neonatal antiretroviral prophylaxis (cART) has been used in high-risk situations in Canada to prevent vertical transmission of HIV (VT), despite limited data supporting its use, and little consensus on optimal regimens and dosing. The objective of this study was to describe the use of cART as prophylaxis in neonates in Canada.

**METHODS:** All HIV-exposed newborns born between 1997-2003 were identified from the Canadian Perinatal HIV Surveillance Program. Neonatal prophylaxis was categorized as single, 2 or 3-drug regimens and further sub-categorized by specific treatment type. Factors associated with prescription of cART (≥3 drugs) were determined by logistic regression.

**RESULTS:** Between 1997-2013 (n=2968), 63.7% of newborns received only zidovudine (ZDV), 17.6% received a two-drug combination (10.1% ZDV and Lamivudine (3TC), 7.3% ZDV and 1-3 doses of nevirapine (NVP), and 0.2% other), and 15.3% received cART (11.3% ZDV, 3TC and a protease inhibitor, 2.2% ZDV, 3TC and 4 weeks of continuous NVP, and 1.8% ZDV, 3TC and 1-3 doses of NVP). The highest proportion of cART prescriptions were from Quebec (45.3%) followed by Ontario (8.4%) and Alberta (7.3%), with the lowest from British Columbia (1%). Factors associated with the prescription of cART (2008-2013) included no maternal antenatal treatment vs. maternal cART (OR: 13.5, 95% CI 7.90-23.40), duration of maternal therapy ≤4 vs. >4 weeks (OR 24.5, 95% CI 12.0-50.0), suboptimal vs. excellent adherence (OR: 39.9, 95% CI 18.2-87.1), no-intrapartum vs. intrapartum ZDV (OR 2.95, 95% CI 1.83-4.75), and region (eastern vs. western Canada, OR 4.05, 95% CI 1.46-11.23). The VT rate in cART-treated infants was 4.07%.

**CONCLUSIONS:** While cART has been used for neonatal prophylaxis in Canada since 1998, there is considerable heterogeneity in regimens used, and prescribing practices across provinces. Further work is needed to identify the safest and most effective cART regimens for newborns at high risk of VT.



## O090

### VERTICAL HIV TRANSMISSION PREVENTIVE INTERVENTIONS CONTINUE TO BE SUBOPTIMAL IN CANADA: EVIDENCE FROM THE CANADIAN PERINATAL HIV SURVEILLANCE PROGRAM (CPHSP)

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**OBJECTIVES:** To describe the completeness of interventions to prevent vertical HIV transmission (VT) in HIV-infected women and their newborns in Canada during the combination antiretroviral therapy (cART) era based on data from the Canadian Perinatal HIV Surveillance Program (CPHSP).

**METHODS:** All children born in Canada to HIV-infected mothers from 1997-2013 in the CPHSP database were reviewed. Completeness of antenatal cART (acART), intravenous zidovudine during labor and post-natal infant zidovudine were assessed.

**RESULTS:** 114 children acquired HIV infection perinatally in Canada during the study period. Of these, 54 (47%) received no preventive interventions and were identified after 3 months of age (median 1.4 years; range 0.27-13.1); 81.5% of these MIP were from Ontario/Quebec, 57.4% were black and 85% had sexual exposure as maternal risk acquisition category. Amongst MIPs identified either antenatally or prior to 3 months of age, the rate of transmission was 2.1% (60/2875). Among the entire cohort of MIP (n=2929), the proportion of mothers who received no/≤4 weeks of acART declined over time, ranging from 40.7-91.3% (1997-2001) to 23.6-30.8% (2002-2005), 14.0-22.9% (2006-2009) and 7.3-9.4%, (2010-2013). Since 2010, ≥1 missed intervention (irrespective of infection status) was identified in 20% (168/853): no acART (4.2%; n=36); ≤4 weeks acART (4.2%; n=36); no intravenous zidovudine during labor (12.7%; n=108); no/incomplete infant therapy (2.8%; n=24). In multivariate analysis (2010-2013 period) receipt of no/≤4 weeks of acART differed by race (Aboriginal 12.9%, White 11.1%, Black 5.8%, other 7.1%; p=0.02); there was a trend for region of birth (AB/SK/MB 11.7%, eastern provinces 7.4%, BC/YT 4.5%; p=0.06). Of 12 babies infected since 2010, 3 were identified after 3 months of age.

**CONCLUSIONS:** While significant reductions in VT have been achieved, implementation of standard-of-care preventive interventions remains suboptimal. Further exploration of circumstances leading to these missed opportunities is urgently needed in order to ameliorate VT in Canada.

## O091

### EVALUATION OF RENAL TOXICITY AMONG INFANTS WITH PERINATAL TENOFOVIR EXPOSURE

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**INTRODUCTION:** Increased tenofovir (TDF) prescribing for HIV+ adults, including pregnant women, has resulted in more women becoming pregnant on TDF or starting it during pregnancy. There is little data on fetal effects of TDF, but animal studies suggest risk for renal and bone toxicity in fetuses exposed during gestation. These toxicities stem from TDF's potential to cause proximal renal tubular dysfunction. We present results of a prospective evaluation for nephrotoxicity in infants with in utero TDF exposure.

**METHODS:** Infants >35 weeks gestation from two Canadian centres born to HIV+ women treated with TDF for at least one month in pregnancy were eligible for inclusion. Testing performed at 1, 6 and 18 months included: plasma creatinine, phosphate; urinary phosphate, creatinine, glucose, calcium, and alpha-1-microglobulin (A1M); and x-rays for rickets assessment.

**RESULTS:** Nineteen TDF-exposed infants 36-41 (median 39) weeks gestation were enrolled. Creatinine clearance was normal in all infants at 1 month (13/13), 6 months (13/13), and 18 months (11/11). Urinary A1M was normal in 10/10, 9/9, and 8/8 infants at 1, 6, and 18 months,

respectively. Tubular reabsorption of phosphate (TRP) was normal (>85%) in all (11/11) infants tested at 1 month, 8/9 at 6 months, and 6/8 at 18 months; mild decreases in TRP were noted in the 3 children (range 80-84%) but with normal serum phosphate measurements. No infants were found to have glycosuria (among 11, 8, & 8 at 1, 6, & 18 months). No radiographic evidence of rickets was noted (14/14 at 1 month, 12/12 at 18 months).

**CONCLUSIONS:** In this prospective evaluation of renal toxicity among TDF-exposed infants, we demonstrated no impairment in overall renal function nor significant renal tubular dysfunction up to 18 months. Ongoing assessment of perinatal TDF renal and bone toxicity is required to better understand its safety in prevention of vertical transmission.

## O092

### PHARMACOKINETICS OF RALTEGRAVIR IN HIGH-RISK EXPOSED NEONATES

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**BACKGROUND:** Raltegravir (RAL), though currently category C in pregnancy, and not recommended for use in newborns, has been used in exceptional cases for preventing mother-to-child-transmission (PMTCT). We report on drug levels in two infants exposed in utero to RAL, and in the first newborn to be treated with RAL for 6 weeks for PMTCT.

**METHODS:** RAL levels in exposed newborns from the Centre Maternel et Infantile sur le Sida (CMIS) mother-child cohort were tested on the first available stored plasma sample after birth, and in the treated newborn, pre- and post-therapeutic drug monitoring was done at weekly intervals.

**RESULTS:** In RAL-exposed infants, RAL was given to mothers at standard dosing of 400 mg BID during pregnancy. RAL levels tested in two newborns at 16 and 30 hours of life were detectable at 0.9345 mg/L and 0.0381 mg/L, respectively. RAL granules for suspension (Merck, special access) were obtained for the treatment of a term newborn (39 weeks GA) from a mother with multidrug-resistant virus, and was started at 1.5 mg/kg BID, along with zidovudine and lamivudine at standard newborn doses. RAL levels were consistently above the targeted trough for treatment (0.02 mg/L) (Table 1) for the duration of therapy. There were no clinically significant adverse events.

**CONCLUSION:** RAL in the newborn at doses of 1.3-1.6 mg/kg BID was well tolerated and resulted in therapeutic drug levels. Given detectable levels of RAL in the first 30 hours of life in exposed infants, the role of RAL in PMTCT should further be considered.

Table 1: Raltegravir Levels in a Treated Newborn

| Day of Life | Weight (kg) | Dose     | mg/kg/ dose | Trough (hours) | Trough Level | Peak (hours) | Peak Level | Adjusted              |
|-------------|-------------|----------|-------------|----------------|--------------|--------------|------------|-----------------------|
| 6           | 3.115       | 5 mg BID | 1.61        | 11.67          | 0.36         | 1.97         | 0.87       | No                    |
| 9           | 3.220       | 5 mg BID | 1.55        | 11.25          | 0.75         | 1.25         | 0.15       | No                    |
| 20          | 3.565       | 5 mg BID | 1.40        | 12             | 0.07         | 1.17         | 0.33       | No                    |
| 27          | 3.835       | 5 mg BID | 1.30        | 11             | 0.06         | 1.15         | 0.02       | Increased to 6 mg BID |
| 40          | 4.275       | 6 mg BID | 1.40        | N/A            | N/A          | N/A          | N/A        | Stopped               |

## O093

### ACCESS TO INFERTILITY SERVICES IN CANADA FOR HIV-POSITIVE INDIVIDUALS AND COUPLES IN 2014

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**INTRODUCTION:** Since the introduction of combination antiretroviral therapy, patients with HIV have successfully kept their viral loads to an undetectable level and reduced mortality and morbidity. With this, pregnancy planning has become an important issue for HIV-positive individuals and couples. In 2007, a study surveying Canadian fertility clinics found a lack of access to fertility services for HIV-positive patients. Given



the extensive efforts made to address this lack of services, a follow up assessment was warranted. We assessed the access to Canadian fertility clinics and services for HIV-positive individuals in 2014.

**METHODS:** Surveys were sent to medical and laboratory directors of assisted reproductive technology (ART) clinics registered under the Canadian Fertility and Andrology Society (as such a sample size of convenience was applied). Main outcomes included: the proportion of fertility clinics in Canada willing to provide ART to HIV-positive individuals; the specific services offered, and; whether SOGC HIV Pregnancy Planning guidelines were implemented to inform practice.

**RESULTS:** Across Canadian provinces, 20/34 (59%) clinics completed the survey. 95% (19/20) of clinics accept HIV-positive patients for consultation; of these, 58% (11/19) have seen either HIV-positive men or women in the last twelve months. While clinics in every province offer infertility investigation and risk reduction techniques, full ART is only offered in 10/20 (50%) clinics in five provinces. Ten clinics (50%) in five provinces were aware that guidelines exist, half of which have read them and four report that they have implemented all of the guidelines in their practice.

**CONCLUSION:** Access to fertility clinics for people with HIV seems to have improved over time but is still regionally dependent and full ART is still limited. We will further analyze the comparison to 2007 data to confirm the improvement and tease out which areas could use further advocacy for improved access to fertility services for people with HIV in Canada.

## O094

### LOW PROLACTIN AND HIGH 20 $\alpha$ -HYDROXYSTEROID DEHYDROGENASE (20 $\alpha$ HSD) MAY CONTRIBUTE TO CART-INDUCED PROGESTERONE DEFICITS IN PREGNANCY

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**BACKGROUND:** Combination antiretroviral therapy (cART) has been linked to pregnancy complications. Previously we have shown that cART exposure was associated with decreased levels of progesterone (P4) mid-pregnancy in HIV+ cART-exposed women, and P4 levels correlated with birth weight percentiles. In mice, progesterone supplementation improved cART-induced fetal weight deficits. Here we investigate the molecular mechanisms leading to cART-associated P4 alterations.

**METHODS:** Levels of enzymes of P4 synthesis and metabolism were assessed by qPCR on placenta tissue from HIV+ cART-exposed (Study group, N=33) and HIV-negative women (Control group N=15). Plasma P4 and human prolactin (hPL) levels were quantified at gestational week 33-37 by EIA. BeWo cells were treated with increasing doses of hPL and 20 $\alpha$ HSD and P4 levels were measured by qPCR and EIA respectively. P4 levels in cART-exposed BeWo cells were assessed with or without 20 $\alpha$ HSD inhibition.

**RESULTS:** P4 levels were significantly lower in the study group compared to the control group. Placental expression of most P4 metabolism enzymes was similar between groups. Only the P4-eliminating enzyme 20 $\alpha$ HSD was significantly higher in the study group. hPL, the main regulatory hormone for 20 $\alpha$ HSD, was significantly lower in the study group compared to controls. 20 $\alpha$ HSD expression significantly correlated with hPL levels in women's plasma at GW 33-37 ( $r=-0.822$ ,  $p<0.0001$ ). In BeWo cells, hPL down-regulated 20 $\alpha$ HSD expression and P4 production in a dose-dependent manner. cART exposed BeWo cells produced significantly less P4 compared to controls, and P4 levels were restored by inhibiting 20 $\alpha$ HSD activity.

**CONCLUSIONS:** Our data suggest that low P4 levels observed in cART-exposed HIV+ pregnant women could be the result of higher levels of 20 $\alpha$ HSD induced by low hPL levels. We describe a new mechanism by which cART maybe influencing maternal hormone balance during pregnancy, and identify potential new therapeutic targets that may improve birth outcomes for HIV+ women on cART.

## O095

### PREGNANCY PLANNING CHOICES FOR PEOPLE LIVING WITH AND AFFECTED BY HIV: PILOTING A DISCRETE CHOICE EXPERIMENT TO EVALUATE FACTORS THAT INFLUENCE DECISION MAKING

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**INTRODUCTION:** With the increase in pregnancy intention among people with and affected by HIV (PWAH) in Canada, the need to understand their decision-making is vital. The discrete choice experiment (DCE) method measures preferences for attributes (factors) in the face of multiple benefit-risk trade-offs. In this study, the decision was in regards to pregnancy-planning choices for PWAH.

**METHODS:** The attributes were: different methods of conception, risk of vertical and horizontal HIV transmission or super-infection, chance of successfully conceiving, cost, and duration of travel. Split sample analysis using the nested logit regression approach was employed to analyze the affect of the attribute levels on respondents' preferences. The relative ranking of the attributes were examined through an importance score, which calculates the relative importance of each attribute such that the importance values of the attributes add to 100%.

**RESULTS:** Thirteen respondents completed a HIV+woman/HIV-man DCE and 12 respondents completed a HIV+woman/HIV+man DCE. For HIV+women/HIV-men, the attributes: horizontal and vertical transmission risk, 5-hour travel time, and cost were statistically significantly associated with decreased utility. Respondents' utility for an increased chance of a successful pregnancy was positive and statistically significant. For HIV+women/HIV+men, vertical transmission risk and cost were statistically significantly associated with decreased utility. Respondents' utility for an increased chance of a successful pregnancy was positive and statistically significant. For HIV+women/HIV-men, the derived highest to lowest attribute rankings were: likelihood of successful conception method, method of conception, vertical transmission risk, cost, horizontal transmission risk, then travel time. For HIV+women/HIV+men, the ranking was: likelihood of successful conception method, vertical transmission risk, cost, methods of conception, time travel, then horizontal transmission risk.

**CONCLUSION:** We determined that while risk of HIV transmission and cost were associated with decreased utility, participants placed the highest importance and demonstrated increased utility related to the likelihood of successful conception. These findings require confirmation in a larger study.

## O096

### MATERNAL SMOKING DURING PREGNANCY EXERTS GREATER INFLUENCE ON INFANT LEUKOCYTE TELOMERE LENGTH AT BIRTH THAN IN UTERO HIV OR ANTIRETROVIRAL DRUG EXPOSURE

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<sup>1</sup>Vancouver, BC; <sup>2</sup>Montreal, QC; <sup>3</sup>Ottawa; <sup>4</sup>Toronto, ON

**BACKGROUND:** Maternal combination antiretroviral therapy (cART) in pregnancy could have long-term consequences for HIV-exposed uninfected (HEU) children. Some antiretrovirals and HIV proteins inhibit telomerase. As leukocyte telomere length (LTL) is a marker of cellular aging and is linked to age-related morbidities, our objective was to compare HEU and HIV-unexposed uninfected (HUU) control infant LTL at birth and over the first three years of life, and investigate any relationship to cART exposure.

**METHODS:** Of 324 HEU children aged 0-3y enrolled in the CARMA cohort study, most (n=215) had  $\geq 2$  blood samples collected. HUU controls (0-3y, n=308) had a single blood sample each. Relative LTL was measured via monochrome multiplex qPCR. A subset of 0-3y HEU and HUU children were age- and sex-matched 1:1. Factors associated with LTL were investigated using linear regression modeling.

**RESULTS:** In a cross-sectional analysis of LTL at birth (0-3d) in 115 HEU (56% male) and 91 HUU (54% male), male sex was associated with shorter LTL at birth ( $p=0.02$ ). In a multivariable model, there was

no discernible effect of maternal age or ethnicity on LTL but there was some trend toward higher birth weight being associated with shorter LTL ( $p=0.07$ ). There was a significant ( $p<0.001$ ) interaction between HEU/HUU status and maternal smoking in pregnancy (~50% smoked), whereby maternal smoking was associated with significantly shorter LTL in HEU and longer LTL in HUU. Among HEU, neither duration of cART exposure in utero nor type of cART was related to birth LTL. Furthermore, among age and sex-matched children ( $n=214:214$ ), LTL attrition rate was similar between groups ( $p=0.69$ ).

**CONCLUSIONS:** These results further support that exposure to maternal HIV/cART in utero does not affect infant LTL, a reassuring finding. The opposite LTL effect associated with maternal smoking may relate to other factors such as fetal growth.

## Epidemiology and Public Health: Continuum of HIV Care

## Épidémiologie et santé publique : Continuum de soins du VIH

### O097

#### DETERMINANTS OF ACCESS TO HIV TESTING IN SASKATOON HEALTH REGION: STANDARD VS RAPID POINT-OF-CARE TESTING

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Saskatoon, SK**

**BACKGROUND:** Saskatchewan has the highest HIV incidence among Canadian provinces, over twice the national average. As part of provincial and regional HIV control strategies, rapid point-of-care testing has been introduced to enhance case-finding. This study examines the characteristics and test results of populations accessing rapid and standard testing in Saskatoon Health Region (SHR).

**METHODS:** Cross-sectional study examining data collected during delivery of rapid and standard HIV tests in SHR, May 2013-August 2014. Variables collected include age, gender, postal code of residence (transformed to neighbourhood deprivation quintile), test type and result. Chi-square testing and logistic regression analyses were performed.

**RESULTS:** SHR provided 1,890 rapid HIV tests and 17,890 standard HIV tests during the study period. Median age at testing was 26 years [IQR 21-35], with approximately 59% of testers male, 41% female and less than 1% transgender. 45.49% of tests were performed by residents of the two most deprived quintiles, 21.47% by residents of the middle quintile, and 33.04% by residents of the two least deprived quintiles. There was a significant association between receipt of testing and male gender, neighbourhood deprivation and age >25 years ( $p<0.05$ ). Rapid testing was significantly more frequently completed than standard testing among residents of the most deprived neighbourhood quintile and among individuals >25 years of age ( $p<0.05$ ). While the rate of HIV positivity was greater among rapid tests than among standard tests, this relationship was not statistically significant (1.9% of rapid tests and 1.2% of standard tests were positive,  $p=0.125$ ).

**CONCLUSIONS:** Rapid HIV testing was completed by a population with differing composition than the population completing standard testing, in terms of neighbourhood deprivation quintile and age. Expansion of this testing modality should be considered in the study context, in order to enhance access to testing, case-finding, HIV prevention and treatment outcomes among all communities.

### O098

#### PERCEIVING SEROCONVERSION SYMPTOMS

**Adam, Barry D<sup>1,2</sup>; Brooks, James<sup>3</sup>; Archibald, Chris<sup>3</sup>;  
Kovacs, Colin<sup>1</sup>; Mykhalovskiy, Eric<sup>1</sup>; Rourke, Sean<sup>1</sup>; Shahin, Rita<sup>1</sup>;  
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**<sup>1</sup>Toronto; <sup>2</sup>Windsor; <sup>3</sup>Ottawa; ON**

**BACKGROUND:** To encourage more MSM to test for HIV more often, some health promotion campaigns seek to educate them to recognize seroconversion symptoms. As part of a larger study of the social networks and circumstances of HIV seroconversion, newly diagnosed men were asked their perceptions of their own seroconversion symptoms.

**METHODS:** 51 men, drawn from 2 downtown Toronto clinics that record the highest rate of HIV positive tests in Ontario were interviewed within a year of their seroconversion concerning signs and symptoms experienced prior to testing using the question, "Did you experience flu-like symptoms, fevers, rashes, muscle and headaches, sore throats and diarrhoea over the last year?" Recent seroconversion was verified through biological markers, testing history, and self-report of risk behaviour and seroconversion symptoms.

**RESULTS:** 11 of 51 report signs or symptoms (typically fever, rash, and/or diarrhoea) for which they sought medical attention and/or suspected were related to HIV seroconversion. Another 21 report symptoms that they perceived to be ambiguous, only possibly attributable to HIV, or categorizable as HIV-related only in retrospect. These were typically one or two flu or flu-like symptoms, malaise, swollen lymph glands, sweating, or exacerbation of pre-existing conditions. The remaining 19 could not recall any signs or symptoms at all.

**CONCLUSIONS:** This profile of perceptions of seroconversion signs and symptom poses challenges to HIV testing and prevention. Educating people on seroconversion symptoms is likely to have limited effect in encouraging HIV testing among the newly infected as just 22% of this set of new seroconverters perceived themselves as having signs or symptoms that could be attributed to HIV prior to testing positive. Most report symptoms that they perceived to be temporary or indistinguishable from stress or party-related symptoms or other viral infections.

### O099

#### COST-UTILITY ANALYSIS OF TEXT MESSAGING INTERVENTIONS FOR IMPROVING ANTIRETROVIRAL THERAPY ADHERENCE IN PEOPLE LIVING WITH HIV

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Lester, Richard T<sup>2</sup>; Mbuagbaw, Lawrence<sup>1</sup>**

**<sup>1</sup>Hamilton, ON; <sup>2</sup>Vancouver, BC**

**BACKGROUND:** Antiretroviral therapy has reduced the morbidity and mortality due to HIV. However, it only works if adherence is optimal. Text messaging interventions have been shown to improve adherence to ART, yet it is unclear if they are cost-effective.

**OBJECTIVES:** To examine the cost effectiveness of text messaging interventions in comparison to standard of care.

**METHODS:** We retrieved data from an overview of reviews to comprehend the scope of text-messaging interventions in impacting adherence. A systematic review was conducted to establish pooled estimates of EQ-5D utility values for the HIV/AIDS health states. A deterministic and probabilistic cost-utility analysis was conducted with a 50-year time horizon and 1-year cycle. The Ministry of Health and Long-term Care perspective was used to obtain measures for costs. The incremental costs and quality adjusted life years were calculated to estimate the cost-effectiveness of text messaging interventions in improving adherence to ART in people living with HIV.

**RESULTS:** The deterministic incremental cost-effectiveness ratio was found to be \$22,247.97 per quality adjusted life year (QALY) and the probabilistic model based on 1000 simulations was found to be \$21,659.21 per QALY. Based on a threshold of \$50,000 per QALY the text messaging intervention is cost effective. One-way deterministic sensitivity analysis supported the cost-effectiveness of the intervention.

**CONCLUSIONS:** Text messaging interventions to improve adherence to ART in people living with HIV are cost effective. Further economic evaluations incorporating cost data from Canadian trials, and other outcomes are needed before the program can be taken to scale.

**O100****BARRIERS TO ACCESS FOR CANADIANS WHO USE CANNABIS FOR THERAPEUTIC PURPOSES**

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**BACKGROUND:** There is increased interest in the therapeutic potential of cannabis in recent decades. As many as one-third of people living with HIV/AIDS use cannabis to relieve symptoms. Canada, the Netherlands, Israel and some states in the United States have developed programs to allow access to cannabis for therapeutic purposes (CTP). In Canada, enrollment in the federal CTP program represented fewer than 5% of the estimated users of CTP. The discrepancy between the number of Canadians who reported using CTP and the rate of utilization of the federal CTP program suggests the existence of barriers to access to this program.

**METHODS:** In the present study we employed a health services analytical framework to examine barriers to access to CTP among 628 self-selected current CTP users. We defined barriers to access as areas of poor fit between clients and services. We used five dimensions of accommodation, accessibility, availability, affordability, and acceptability to examine access to CTP.

**RESULTS:** Our findings revealed that it is difficult for Canadians to find a physician to support their application to access CTP. Accessing CTP from unauthorized sources was common; only 7% of respondents accessed CTP exclusively from authorized sources. Access to CTP was positively associated with the presence of medical cannabis dispensaries, which were not included in the regulatory regime. Access to CTP varied by medical condition and general quality of health. Affordability of CTP was a substantial barrier to access.

**CONCLUSIONS:** Strategies need to be developed to encourage scientific inquiry into CTP and address the barriers to access to CTP and the stigma and controversy that surround CTP and strain patient-physician relationships.

**O101****IMPACT OF SOCIAL DETERMINANTS OF HEALTH AND SUBSTANCE USE ON HIV VIRAL SUPPRESSION (SVL)**

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<sup>1</sup>Toronto, ON; <sup>2</sup>Ottawa, ON

**BACKGROUND:** sVL is the goal of antiretroviral treatment (ART) and is critical for the success of Treatment as Prevention (TasP). We investigated effects of social determinants of health and substance use in a clinical cohort in Ontario.

**METHODS:** The Ontario HIV Treatment Network Cohort Study (OCS) is a multi-site clinical cohort of people receiving HIV care. Data collection includes chart review, annual interviews, and record linkage with the provincial public health laboratory for viral load tests. Among participants interviewed between 2008 and 2011 and who were on ART, we estimated the annual proportions with sVL (<200 copies/mL) as of the last VL in the year. We calculated ratios of proportions according to time-updated socioeconomic and behaviour factors, adjusted for clinical characteristics, using multivariable generalized estimating equations with a log link function.

**RESULTS:** A total of 3,322 participants were followed for 7,309 person years. The mean annual proportion with sVL was 93.3%; this rose from 91.4% in 2008 to 94.8% in 2011. Independent prognostic factors for sVL are shown in table with lowest proportions observed for lowest income category, living alone, current smoker, IDU. In the subset of 1,291 participants with cannabis use data, use in the last 30 days was associated with improved sVL.

| Prognostic factor for sVL                     | Category                    | Mean annual proportion | Adjusted* ratio of proportions (95% CI) |
|---|-----------------------------|------------------------|---|
| Personal income (Canadian dollars)            | <\$20,000                   | 90.4%                  | 0.97 (0.95, 0.99)                       |
|   | \$20,000 to <\$40,000       | 94.0%                  | 0.99 (0.97, 1.01)                       |
|   | \$40,000 to <\$60,000       | 96.2%                  | 1.00 (0.99, 1.02)                       |
|   | Over \$60,000               | 96.6%                  | 1                                       |
| Living alone                                  | No                          | 94.2%                  | 1                                       |
|   | Yes                         | 92.2%                  | 0.98 (0.96, 1.00)                       |
| Cigarette smoking                             | Never smoked                | 94.7%                  | 1                                       |
|   | Former smoker               | 96.1%                  | 1.01 (0.99, 1.02)                       |
|   | Current smoker              | 89.9%                  | 0.96 (0.94, 0.98)                       |
|   | Occasional smoker           | 91.6%                  | 0.98 (0.94, 1.01)                       |
| Recent non-medicinal drug use (past 6 months) | No                          | 94.2%                  | 1                                       |
|   | Yes, IDU                    | 83.9%                  | 0.93 (0.87, 0.99)                       |
|   | Yes, no IDU                 | 90.0%                  | 0.97 (0.95, 0.99)                       |
| Cannabis use**                                | Past 30 days                | 94.3%                  | 1.04 (1.01, 1.07)                       |
|   | Past year, not past 30 days | 90.0%                  | 0.99 (0.96, 1.03)                       |
|   | More than a year ago        | 93.6%                  | 1.01 (0.99, 1.04)                       |
|   | Never                       | 93.0%                  | 1                                       |

\* Adjusted for all covariates shown and year, age, sex, ethnicity, region, immigration, years HIV+, time on ART, ART regimen, education, employment status, marital status, living with children, alcohol use, and clinic site.

\*\* Subset analysis

**CONCLUSION:** Despite being a setting with access to universal health care, poverty, social factors, tobacco and substance use were independently associated with unsuppressed VL, although disparities were slight and direction of effects varied. This should be taken into account when designing comprehensive TasP interventions.

**O102****DEMOGRAPHICS AND CLINICAL OUTCOMES FOR HIV-POSITIVE INDIVIDUALS IN SOUTHERN SASKATCHEWAN – THE REGINA QU'APPELLE HIV COHORT**

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 Regina, SK

**BACKGROUND:** Saskatchewan currently faces a unique HIV epidemic characterized by high rates of transmission through injection drug use. The Regina Qu'Appelle Health Region Infectious Diseases Clinic (RQHR IDC) is the tertiary referral site for all HIV-positive individuals in southern Saskatchewan. To address the need for epidemiologic and clinical information to characterize the provincial epidemic, as well as providing a framework for an eventual province-wide data set, the RQHR IDC developed a comprehensive database for its HIV-positive individuals, the Regina Qu'Appelle HIV Cohort (RQHC). The development of the RQHC and current demographic and clinical data from the cohort are discussed.

**METHODS:** The cohort consists of all active HIV-positive individuals provided care by the RQHR IDC. Using a heavily customized electronic medical record, epidemiologic and clinical data is collected by clinic staff



at every appointment and is standardized within the charting system for maximal data accuracy.

**RESULTS:** The RQHC consists of 429 patients. Aboriginal peoples account for 231 of 429 (53.8%) of the cohort. Injection drug use is the primary risk factor for 264 (61.5%) individuals, and 244 of 429 (56.9%) have a positive hepatitis C antibody. Of these 244 co-infected individuals, 61 individuals had undetectable hepatitis C viremia, for a spontaneous clearance rate of 25%. 328 of 429 (76.5%) patients are on antiretroviral therapy, and 279 are virologically suppressed (HIV viral load  $\leq$  200 copies/mL). Individuals who identified as Aboriginal had the lowest rates of virologic suppression compared to other ethnicities.

**CONCLUSIONS:** The RQHC informs the current HIV epidemic in Saskatchewan, manifested by high rates of injection drug use and hepatitis C co-infection, and disproportionate representation of Aboriginal peoples. The cohort will provide insight into successes and gaps in care provision in southern Saskatchewan and facilitate regional and provincial research and evaluation initiatives.

## O103

### PHYSICIAN EXPERIENCE AND RETENTION IN CARE FOR PEOPLE LIVING WITH HIV IN ONTARIO: A POPULATION-BASED APPROACH

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<sup>1</sup>Toronto, ON; <sup>2</sup>Ottawa, ON; <sup>3</sup>Victoria, BC

**OBJECTIVE:** We evaluated physician factors associated with retention in HIV care in Ontario using population-based databases.

**METHODS:** We identified people living with HIV in Ontario using health administrative data. We defined the date of engagement in care as the first date on which a physician billing included an HIV-related diagnostic code, an HIV-experienced provider as one who cared for at least 5 HIV-positive people in one year, and retention in care as not having a gap of more than 365 days without seeing an HIV-experienced provider. We used the Andersen-Gill recurrent event model, allowing us to study multiple episodes of non-retention in care over time. Time-varying covariates included seeing a specialist and physician HIV experience. We also evaluated multiple clinical and demographic covariates.

**RESULTS:** We included 12,162 individuals. In multivariable models, each additional episode of non-retention in care was a strong risk factor for future episodes of non-retention (relative rate [RR] 1.43, 95% confidence interval [95CI] 1.40-1.47). Seeing a specialist was associated with retention in care compared to seeing only a family physician (RR 0.92; 95CI 0.87-0.96), but seeing both was the strongest predictor of retention (RR 0.43; 95CI 0.41-0.46). Retention was higher if the first visit was with an HIV-experienced physician (RR 0.85; 95CI 0.78-0.92) or a physician in practice for fewer years (RR per decade 0.91; 95CI 0.89-0.93). Retention in care was also associated with receiving publicly funded drugs, being an immigrant or refugee, older age, being female, region of the province, several comorbidities, and having a previous mental health condition at baseline.

**CONCLUSION:** In Ontario, retention in care is strongly associated with care models in which family doctors and specialist physicians share care for people living with HIV. Retention in care is also associated with seeing an experienced provider at the time of engagement in care.

## O104

### SHIFTING MORTALITY RATES AND CAUSE OF DEATH IN THE COMBINATION ANTIRETROVIRAL THERAPY (ART) ERA AMONG HIV POSITIVE INDIVIDUALS:

#### A COMPARISON WITH THE GENERAL POPULATION

**Eyawo, Oghenowede<sup>1,2</sup>; Nohpal, Adriana<sup>2</sup>; Sereda, Paul<sup>2</sup>; Samji, Hasina<sup>2</sup>; Hull, Mark<sup>2</sup>; Lima, Viviane<sup>2</sup>; Colley, Guillaume<sup>2</sup>; Moore, David<sup>2</sup>; Montaner, Julio S<sup>2</sup>; Hogg, Robert S<sup>1,2</sup>**

<sup>1</sup>Burnaby; <sup>2</sup>Vancouver, BC

**BACKGROUND:** This study aims to examine the changing mortality rates and trends in causes of death over time among HIV-positive individuals in British Columbia (BC), and to compare these patterns of death to those observed in a 1% random sample of the BC population.

**METHODS:** Mortality and cause of death data for individuals ( $\geq 19$  years) in the Comparison of Outcomes And Service Utilization Trends (COAST) study at the BC-CfE were analyzed from 1996 to 2010. Deaths were identified through Population Data BC – which contains information on all registered deaths in BC (BC-Vital Statistics Agency dataset), and classified into categories using ICD 9/10 codes for the underlying cause of death. Crude mortality rates (per 1000 person-years) with 95% CIs were calculated assuming a Poisson distribution. The Cochran-Armitage trend test was used to assess how the distribution of deaths from specific causes has changed over time.

**RESULTS:** Overall, 2,033 (23.6%), 959 (23.3%), and 3935 (8.3%) individuals died during the follow-up period (1996-2010) among HIV-positive individuals ever on ART (n=8,620), HIV-positive individuals never on ART (n=4,110), and HIV-negative individuals (n=47,569), respectively. Mortality rate from HIV-related causes decreased by over 4-fold from 1996-1998 to 2008-2010 ( $p \leq 0.001$  for test of trend) in the two HIV-positive cohorts, and remained over two times higher (1996-2010) among those who were never on ART compared to those who had received ART (16.4 vs 8.9). Variations in death from causes not typically considered to be HIV-related were however less stable and more inconsistent throughout the observation period.

**CONCLUSION:** Our result indicates that deaths from HIV-related causes have decreased markedly among HIV-positive individuals over time. Future analyses will examine mortality trends by causes adjusted by age, sex, time periods and CD4 counts and will also compare mortality rates between the HIV-positive cohorts and the general population (reference) using standardized mortality ratios.

## Social Sciences: Health Services for Populations across Axes of Inequity and Stigmatization

## Sciences sociales : Services de santé pour les populations entre les axes de l'injustice et de la stigmatisation

## O105

### TRANSITIONS IN INFORMAL AND ILLEGAL INCOME GENERATION AND VULNERABILITY TO VIOLENCE AND HIV RISK AMONG PEOPLE WHO USE DRUGS: A QUALITATIVE STUDY

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<sup>1</sup>Vancouver; <sup>2</sup>Burnaby, BC

**BACKGROUND:** Vancouver's Downtown Eastside (DTES) neighbourhood is home to a robust informal economy, including drug and sex work scenes. While income-generating activity is an important determinant of health among people who use drugs (PWUD), the role of transitions between types of income generation within the informal economy in shaping vulnerability to violence and HIV risk remains poorly understood. This study examines how transitions in informal and illegal income-generating activities influence exposure to HIV risk and violence among PWUD in the DTES.

**METHODS:** We conducted qualitative interviews with twenty-five individuals engaged in informal and illegal income-generating activities in the DTES. We analyzed interview transcripts thematically, focusing on relationships between income generation, violence, and HIV risk, and drew upon concepts of social violence when interpreting these themes.

**RESULTS:** Our findings highlight how informal and illegal income-generating activities in the DTES are characterized by structural and everyday violence, and transitions from 'high risk' (e.g., sex work, drug dealing) to perceived 'low risk' (e.g., recycling) activities represented attempts to reduce exposure to violence and HIV risks. Participant accounts underscored how policing strategies and poverty, alongside drug scene and gender-based violence, shaped 'high-risk' informal and illegal income-generating strategies and functioned to increase vulnerability to



HIV risks (e.g., sexual assault, drug sharing). Participants sought out ‘low-risk’ informal income-generating activities (e.g., recycling) to limit exposure to violence and HIV risks. However, participants emphasized how these forms of income generation were nonetheless governed by cultural logics (e.g., ‘street codes’) shaped by everyday violence, and introduced new risks (e.g., infections resulting from cuts received while recycling, violent enforcement of recycling routes).

**CONCLUSION:** Our findings underscore the critical role of income generation in shaping exposure to violence and HIV risk, highlighting the need for low-threshold employment interventions targeting PWUD as a central component of structural HIV prevention strategies.

## O106

### APPLICATION OF THE SUPREME COURT OF CANADA'S LEGAL CRITERIA FOR HIV NON-DISCLOSURE WITHIN A COHORT OF HIV-POSITIVE ILLICIT DRUG USERS IN VANCOUVER

**Patterson, Sophie E<sup>1,2</sup>; Kaida, Angela<sup>1</sup>; Nguyen, Paul<sup>2</sup>; Montaner, Julio S<sup>2</sup>; Hogg, Robert S<sup>1,2</sup>; Milloy, M-J<sup>2</sup>**  
<sup>1</sup>Burnaby; <sup>2</sup>Vancouver, BC

**BACKGROUND:** In October 2012, the Supreme Court of Canada (SCC) ruled that people living with HIV must disclose their HIV status to sexual partners prior to vaginal intercourse, unless they use a condom and have a low viral load, defined as <1500 copies/mL.

**METHODS:** Using cross-sectional data from the AIDS Care Cohort to Evaluate Access to Survival Services (ACCESS) a prospective cohort of HIV-positive illicit drug users in Vancouver, we estimated the proportion of participants who would be legally obligated to disclose their HIV status to sexual partners based on the 2012 SCC ruling. Interviewer-administered surveys collected socio-behavioural data, which were linked with clinical data and de-identified. ACCESS participants interviewed since October 2012 and self-reporting vaginal intercourse within six months before interview were included in the analysis. Participants self-reporting 100% condom use and demonstrating viral load <1500 copies/mL at every test within six months before interview were deemed to satisfy the non-disclosure criteria. Multivariable logistic regression identified independent covariates of satisfying the non-disclosure criteria.

**RESULTS:** Our analytic sample included 176 participants, including 77 (44%) women. The median participant age was 45 (IQR: 40-51), and 42% were in a stable relationship at interview. Within six months before interview, 95% of participants had received ART for ≥1 day, 25% were employed, 12% were homeless, 16% had engaged in sex work, 66% had used injection drugs, and 6% had been incarcerated. Overall, 56% of participants satisfied the criteria for non-disclosure. Independent predictors of not satisfying non-disclosure criteria were female vs. male gender (aOR 0.43 [95% CI: 0.22-0.87]), having one recent sexual partner (vs. >1 partners) (aOR 0.35 [95% CI: 0.16-0.77]), recent incarceration (aOR 0.20 [95% CI: 0.05-0.99]), and being in a stable relationship (aOR 0.40 [95% CI: 0.20-0.80]).

**CONCLUSION:** Female and recently incarcerated participants were less likely to satisfy the non-disclosure criteria, and as such are more likely to face a legal obligation to disclose HIV status, irrespective of the challenges to disclosure within the highly criminalized environment in which they seek care.

## O107

### EMOTIONAL AND BEHAVIORAL IMPACTS OF STUDY PARTICIPATION: NARRATIVES OF BEING A PARTICIPANT IN LONGITUDINAL MIXED METHODS HIV RESEARCH

**Grace, Daniel<sup>1,2</sup>; Steinberg, Malcolm<sup>3</sup>; Chown, Sarah A<sup>1</sup>; Jollimore, Jody<sup>1</sup>; Parry, Robin<sup>1</sup>; Rekart, Michael<sup>1</sup>; Gilbert, Mark<sup>1,2</sup>**  
<sup>1</sup>Vancouver, BC; <sup>2</sup>Toronto, ON; <sup>3</sup>Burnaby, BC

Limited research has explored how participants describe the impact of their involvement in HIV research. We enrolled 166 gay and bisexual men who tested HIV-negative at a community sexual health clinic in Vancouver, British Columbia, into a year-long mixed methods study. Thirty-four of these participants who reported recent condomless anal intercourse, were purposively-recruited into an embedded qualitative study and completed two in-depth interviews to discuss experiences re-

lated to their sexual, social, mental and physical health. We developed semi-structured interview guides with our community partner to understand men's lived experiences as sexually active gay and bisexual men. In addition to other key findings, thematic analysis of these interviews elicited rich accounts of the self-described impacts and knowledge gained from being a study participant in HIV research. Five related impacts of research involvement described by study participants upon their completion of engagement in the study emerged. These included (1) insights into the study processes and methods used (e.g., areas for improvement on research design, data quality and implications for analysis); (2) altruism and pride in contribution (e.g., as a rationale for enrollment and/or an outcome of participation); (3) experiencing research as a form of counseling (e.g., qualitative interviews were described as having a major therapeutic component to them and highlighted the lack of opportunities for many men to discuss their sexual and social health with peers and/or counselors); (4) the impact of study involvement on their testing knowledge and behaviours (e.g., some men described participation increased HIV testing consistency); and (5) the impacts of participation on sexual behaviours and feelings about sexuality (e.g., how one thinks about current/past sex and views on responsibility for HIV/STI prevention). We draw upon this narrative data to discuss implications for research ethics and practice. Our analysis elucidates the potentially complex emotional and behavioral impacts of study participation.

## O108

### DEVELOPING TRAUMA-COMPETENT CARE – A COLLABORATIVE APPROACH

**Wagner, Anne C; McEwen, Owen; Monson, Candice M**  
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Psychological trauma is widely experienced, and can produce a myriad of psychological outcomes (Van Ameringen et al., 2008). Providers within a care system that competently and comfortably respond to individuals who have experienced trauma is essential (Ko et al., 2014). Multiple training models have been developed, and networks are beginning to form to create trauma-competent health care systems in certain jurisdictions (e.g., the U.S. National Child Traumatic Stress Network) (Ko et al., 2014). However, what do trauma-competent individuals and systems look like, and specifically when considering HIV and sexual health? This presentation will describe an on-going project with the Gay Men's Sexual Health Alliance in Ontario to develop trauma-competent trainings for its members. This presentation will draw on best practices in developing trauma-competent approaches to care, and will specifically examine individual settings' needs. The role of community and culture will specifically be examined, with an emphasis on the need to engage in an iterative, community-based process while implementing and developing training modules. The application of these principles with both clinicians and non-clinicians will be highlighted. The presentation will offer the opportunity for reflection regarding identifying provider needs when working with traumatized individuals. Barriers to such systems will be discussed.

## O109

### “IT DEPENDS ON HOW YOU REPRESENT YOURSELF IN PUBLIC”: TRANSGENDER INDIVIDUALS LIVING WITH AND AFFECTED BY HIV AND THEIR ENCOUNTERS WITH FRONTLINE HIV SERVICES

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 Vancouver, BC

**OBJECTIVES:** Globally, transgender sex workers face an overwhelmingly increased burden of HIV. Access to health care services, such as hospitals and drop-in centres that distribute harm reduction supplies, are a vital part of HIV prevention and treatment efforts. However, little is known about the lived experiences of transgender sex workers and HIV-related services. As such, we conducted a qualitative investigation into experiences with HIV-related health care among transgender sex workers in a Canadian setting.

**METHODS:** In-depth semi-structured interviews were conducted with 33 transgender sex workers in Vancouver, Canada between June 2012 and May 2013. Participants were recruited from three open prospective cohorts of individuals who use drugs, an open prospective cohort of sex

workers, and through snowball sampling. Codes and themes were developed using theory-driven and data-driven approaches and two transgender researchers assisted with the analysis.

**RESULTS:** Of the 33 participants, 54.5% (n=18) were HIV positive and all participants reported previous encounters with HIV prevention services. When accessing services participants reported experiencing stigma related to drug use and sex work (e.g., quality of care was affected by being labeled as an individual who uses drugs), discrimination based on their gender presentation (e.g., access to services was dependent on perceptions of femininity), and feelings of not belonging (e.g., name calling by cisgender individuals). Participants reported avoiding hospitals and HIV prevention services due to these experiences.

**DISCUSSION:** Transgender sex workers in this setting reported experiencing a range of barriers to accessing essential HIV-related services. Drug use- and sex work-related stigma coupled with heteronormative practices suggest a critical need for the training of health professionals and HIV services that are welcoming to transgender sex workers. Models of peer sex worker and transgender inclusive HIV services and programs should be considered.

## O110

### SERVICE PROVIDERS, SEX WORKERS, AND SEXUAL HEALTH SERVICES IN TORONTO: A CRITICAL LOOK AT INTERSECTIONALITY AND SERVICE PROVISION

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**INTRODUCTION:** Sex workers (SW) in Toronto are, more than ever, accessing sexual and HIV-related health services in the context of a broader political landscape. Since *Bedford v. Canada*, and subsequent federal Bill C-36, SW have been at the crossroads of surveillance, criminalization, politics, community and visibility. This research explores sex work, HIV status, race, class, trans identity, employment, and homelessness as these intersect with sexual health services, and the national, provincial and local policies that structure standards of service provision, and effect accessibility and inclusion for SW.

**METHODS:** An online survey that addresses service delivery to SW is being distributed to sexual health service providers and s SW in Toronto. Data collected explores perceived dynamics between service providers and SW, and the availability, form, quality and barriers to the provision. Analysis will focus on bivariate associations with an emphasis on intersections that impede quality health service interactions. This study has been reviewed for ethics by the University of Toronto.

**FINDINGS:** Programs and services that seek to address the sexual and HIV health of SW are constrained by discrepancies between health client need, the limits of service provision, the occupational landscapes of sex work, and the stigma and discrimination encountered when accessing sexual and HIV health care.

**CONCLUSION:** These research findings can reveal discrepancies in HIV health and social care to SW within the current Canadian political landscape, allowing sexual and HIV health service groups to expand on strategies for more accessible care to SW. By better understanding the intentions of HIV and sexual health services, and the perceived effectiveness of these for people like SW, this research will highlight the lived experience of accessing care while addressing the intersections of diverse social and systematic realities that influence the structure of HIV and sexual health care delivery.

## O111

### BEYOND THE COLONIAL DIVIDE: ALLIANCE BUILDING BETWEEN AFRICAN DIASPORIC AND INDIGENOUS COMMUNITIES IN HIV PREVENTION

**Wilson, Ciann**  
Toronto, ON

**BACKGROUND:** The legacies of colonization through the appropriation of Indigenous land and the import of African slave labor were integral for the colonial project, a project that unintentionally connected these groups throughout time and space. From this point onward, Indigenous and African diasporic communities would be connected through their shared, and distinct histories of resistance and oppression, which

had ill consequences for their health as both communities are disproportionately impacted by HIV.

**METHODS:** Data for this paper comes from my doctoral research project, in which I employed conventional qualitative methods (e.g. focus groups and interviews) with innovative feminist and arts-based approaches (digital storytelling and collaborative mural-making) to explore how Indigenous and ACB youth view alliance building for HIV prevention and health promotion in their communities. Paying homage to the social resistance that sparked the HIV movement in the 1980s, as well as Indigenous sovereignty and Black liberation struggles, in this project I explore the questions: In what ways did and didn't the youth move beyond the colonial divide when undertaking this collaborative project? And how were the benefits and challenges of these partnerships represented artistically in the youth-led collaborative mural?

**RESULTS/DISCUSSION:** Youth leaders were very optimistic about the potential for co-resistance and collaboration between their communities for the sharing of Indigenous and alternative healing, cultural practices, health promotion messaging and HIV prevention approaches. However, the youth identified that such collaborations are also heavily fraught with tensions, contradictions and conflict, including the 'oppression olympics' that occur between different groups; settler of colour colonialism; anti-black racism; and the need for the decolonization of both groups. I take from anti-racist and Indigenous scholarship to unpack these research findings. This work is of great value as Indigenous and African Diasporic communities have younger populations than other groups, making youth contributions towards the health and wellbeing of these communities significant and transformative. These young people can be a part of health promotion strategies that have lasting generational consequences within their communities for generations to come.

## O112

### WHAT IS IT WAS YOU(TH)? REFLECTIONS ON HIV AND HCV PREVENTION AMONG YOUTH IN THE ATLANTIC REGION

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<sup>1</sup>Halifax, NS; <sup>2</sup>Moncton, MB; <sup>3</sup>St John's, NL; <sup>4</sup>Charlottetown, PE

**INTRODUCTION:** Within Atlantic Canada unique challenges exist in the promotion of youth-oriented HIV and HCV prevention. Recognizing this, a 3-year study "Our Youth, Our Response" (OYOR) was initiated to support Atlantic wide HIV and HCV prevention policy and programmatic responses to meet the unique needs of Atlantic Canadian youth.

**METHODS:** The OYOR research team conducted 3 iterative stages of data collection and analysis: A policy scan of existing HIV/HCV prevention documents (Year 1), in-depth interviews with key informants from education, health and corrections sectors (Year 2), and focus groups with youth and youth-serving health and social organizations (Year 3). Interview and focus group data were audio-taped and transcribed, and thematic analysis was conducted.

**RESULTS:** Many HIV/HCV prevention policies and programs within the region do not differentiate between the needs of youth and those of adult populations resulting in missed opportunities for providing youth-friendly HIV/HCV testing and referral services. School-based sexual health curricula are not standardized, nor are measures in place to ensure that youth are provided comprehensive, accurate, and relevant prevention information. In particular, little information is provided to youth regarding the types of services that are available within their communities. Prevailing stigma regarding youth sexuality, misconceptions related to HIV/HCV, and a lack of youth-focused harm reduction services further exacerbate these issues.

**CONCLUSIONS:** To address these challenges there is a need to mobilize existing expertise within each of the Atlantic Provinces, to share resources and expertise, and to reduce duplication of effort – all with an emphasis on increasing youth access to testing options, reframing harm reduction, and expanding education provided to youth, parents, and service providers. This can be achieved, in part, through multisectoral responses that incorporate youth as active partners. It is critical that these steps serve as the foundation for the next generation of youth-oriented HIV/HCV prevention innovation.

## Special Session: Community Practice Research

## Séance spéciale : Recherche en pratique communautaire

### O113

#### ENSURING THE VOICES, RECOGNITION, AND WELL-BEING OF PEER RESEARCHERS IN THE APPLICATION OF GIPA/MIWA PRINCIPLES: ETHICAL TENSIONS IN CONDUCTING RESEARCH WITH WOMEN LIVING WITH HIV IN CANADA

O'Brien, Nadia<sup>1</sup>; Gahagan, Jacqueline<sup>2</sup>; Wertheimer, Sophie<sup>3</sup>; Carter, Allison<sup>4,5</sup>; Proulx-Boucher, Karène<sup>1</sup>; Thomas-Pavanel, Jamie<sup>3</sup>; Tharao, Wangari<sup>3</sup>; Greene, Saara<sup>6</sup>; Dubuc, Danièle<sup>1</sup>; Buhler, Shayna<sup>7</sup>; Conway, Tracey<sup>3</sup>; Beaver, Kerrigan<sup>3</sup>; Kaida, Angela<sup>4</sup>; de Pokomandy, Alexandra<sup>1</sup>; Loutfy, Mona R<sup>3</sup>; The CHIWOS Research Team<sup>3</sup>

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**INTRODUCTION:** While the Greater Involvement of People Living with HIV/AIDS (GIPA) and the Meaningful Involvement of Women Living with HIV/AIDS (MIWA) are core principles in participatory research with Women Living with HIV (WLHIV), ethical tensions emerge in the application of these principles, especially within the context of HIV-stigma, barriers to disclosure, and intersecting inequities.

**METHODS:** Peer, academic, and community researchers from the Canadian HIV Women's Sexual and Reproductive Health Cohort Study (CHIWOS), a longitudinal, Community-Based Research study operating in British Columbia, Ontario, and Quebec, examined the question: what tensions emerge when applying GIPA/MIWA principles in research with WLHIV in Canada?

**RESULTS:** Reflecting on moving GIPA/MIWA from principle to practice, we identified the following tensions: (1) Participation: ensuring the meaningful participation of Peer Researchers must be met with adequate training, guidance and support, and appropriate compensation including payment for time, travel, and preparation, a challenge in projects with limited funds. Further, meaningful participation varies greatly depending on the time, capacity, and interest of every Peer Researcher. Particular attention must also be paid to bridging linguistic barriers in a bilingual, national study. (2) Recognition: crediting peer contributions and being transparent (for partners and participants) about the input of WLHIV within CHIWOS must be balanced with the need to protect HIV-confidentiality. (3) Well-being: though it is imperative to provide a safe and healthy work environment, Peer Researchers may be confronted with emotionally traumatizing information during interviews, and may find themselves in precarious situations when navigating insider/outsider roles on the research team and within their communities.

**CONCLUSIONS:** Various tensions emerge when moving GIPA/MIWA from principle to practice. Research teams must be flexible, communicative and creative in order to properly recognize and engage WLHIV, despite the current context of limited funding, HIV-stigma, barriers to disclosure and intersecting Social Determinants of Health which impinge on the full realization of GIPA/MIWA principles. The perspectives and resilience of WLHIV can provide rich insights into these challenges and their mitigating factors.

### O114

#### COMBINING STRENGTHS TO ADDRESS THE NEEDS OF FAMILIES LIVING WITH HIV: A CLINICAL INSTITUTION/COMMUNITY-BASED ORGANIZATION PARTNERSHIP TO SUPPORT FAMILIES LIVING WITH HIV

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**BACKGROUND:** CHEO (Children's Hospital of Eastern Ontario) and ACO (AIDS Committee of Ottawa) identified a lack of awareness about and engagement with support services amongst families living with HIV who access care at CHEO. Common goals and challenges between the

two organizations in providing support were identified. A formal partnership was developed enabling sharing of experiences and expertise between clinicians, support workers and community. Program development, implementation and lessons learned are described.

**DESCRIPTION:** Members of ACO's Afro-Caribbean support group voiced concerns that some families in the Ottawa region were not engaged with support services yet had challenges that were not being addressed. The idea of offering ACO services within the CHEO HIV clinic was proposed, leading to a partnership agreement enabling the ACO worker to attend clinics and the clinic social worker to attend ACO support groups. Program objectives were to reduce stigma, enhance services and collaboration amongst organizations, and increase awareness and accessibility of clinic and community services. After six months, a program review revealed that 47 families who were not previously accessing community services had initial encounters in the clinic setting with 22 remaining engaged with ACO. Issues identified included immigration, medication access, system navigation, isolation, food security, housing and childcare. Services accessed included the food bank; legal, social and health service referrals; support groups; and harm reduction.

**LESSONS LEARNED:** Meeting the support worker in a familiar clinic environment often led to engagement by women previously unable to connect with peers or acknowledge their diagnosis. The partnership allowed for meaningful family centered care by the clinic, supporting parents in ways that were not previously possible. The two roles (support worker and social worker) are complementary.

**CONCLUSIONS:** This unique institution-agency partnership enabled sharing of views, resources and information leading to improved client engagement in services, optimizing each organization's capacity.

### O115

#### PRA LEARNING MODULES FOR COMMUNITY-BASED ORGANIZATIONS SEEKING TO BE MORE INVOLVED WITH RESEARCH INCORPORATING GIPA/MIWA PRINCIPLES: USING PREZI-BASED LEARNING MODULES AS A KNOWLEDGE TRANSLATION STRATEGY TO COMMUNICATE A MODEL OF NAVIGATING THE PROCESS OF INTEGRATING PRAS AT A COMMUNITY-BASED HIV HEALTH CARE ORGANIZATION

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<sup>1</sup>Vancouver; <sup>2</sup>Victoria, BC

**ISSUES:** Increasingly, community-based organizations are employing Peer Research Associates (PRA) on HIV research projects. The PRA role creates space for meaningful and active participation of people living with HIV in research, and improves the quality of participant responses. Despite the growing use of PRAs, there are few published models or dynamic "how-to" guides for community-based organizations seeking to integrate PRAs on research projects.

**DESCRIPTION:** To assist community-based organizations navigate the process of integrating PRAs in research projects, the Dr. Peter Centre (DPC, a not-for-profit community HIV health care organization) documented its experience of recruiting, hiring, training, orientating, supervising, and mentoring PRAs for a large-scale research project. To document the process, the DPC hired an independent PRA to interview the two PRAs hired for the large-scale research project as well as various parties who influenced the hiring process including: DPC staff, external researchers, and members of a Community Advisory Committee that includes DPC stakeholders and four DPC clients. Interview findings were synthesized, developed into six Prezi-based Learning Modules, and then disseminated to Canadian community-based organizations, researchers and policymakers in December 2014.

**LESSONS LEARNED:** Initial responses to the PRA Learning Modules were extremely positive. As a knowledge translation strategy, using Prezi to communicate this model to other community-based organizations has several advantages: i) it is web-based and can be developed by multiple parties working from different locations, and then disseminated easily; ii) audio recordings for slide narration can be easily made and revised for single slides; iii) unlike academic papers with codified rules and language, this knowledge translation strategy allowed us to cover multiple topics relevant to community-based organizations while using accessible language.



**RECOMMENDATION:** Knowledge translation strategies that meet the unique requirements of community-based organizations are needed to effectively communicate models that can improve the functioning and services of those organizations.

## O116

### EXPLORING THE ROLES OF COMMUNITY-BASED ORGANIZATIONS (CBOs) IN THE ROLLOUT OF HIV PRE-EXPOSURE PROPHYLAXIS (PrEP) AMONG TORONTO GAY, BISEXUAL & OTHER MSM (GBMSM)

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<sup>1</sup>Toronto, ON; <sup>2</sup>Vancouver, BC

**BACKGROUND:** PrEP is an emerging strategy for HIV prevention in Canada, particularly for gbMSM. While PrEP is generally considered a biomedical intervention, there may be important roles for CBOs to play in an HIV prevention landscape that includes PrEP.

**METHODS:** We invited representatives from 26 Toronto-based organizations serving a range of culturally diverse gbMSM to participate in a series of Think Tanks exploring the needs & roles of CBOs in PrEP rollout. The first session was held on 10/Dec/2014; three will be held in 2015. Participants completed a brief survey and participated in small group discussions. Results will be used in subsequent sessions to co-develop an action agenda on CBO involvement in PrEP implementation.

**RESULTS:** Most organizations (n=22) agreed to participate; one declined and three did not respond. Seventeen organizations attended the first session; twenty completed the survey. Half the organizations were ASOs; the remainder included government (n=1), public health (n=1), and healthcare (n=3) and mental health service (n=3) organizations. 75% felt comfortable sharing PrEP information with clients but only 35% felt comfortable delivering PrEP-related services. Participants were generally supportive of PrEP because of its potential to improve HIV prevention and provide additional benefits, such as reduced HIV-related anxiety and stigma and increased self-efficacy and empowerment. However, participants expressed concerns related to toxicity, adherence, stigma, risk compensation and increased STI rates, access and the “medicalization” of HIV prevention. Possible roles in implementation identified included education, awareness raising, adherence support, referrals to prescribers, assistance covering medication costs, research and advocacy. Some were skeptical of their role due to access barriers for their clients or because PrEP was viewed as a medical intervention.

**DISCUSSION:** CBOs are generally supportive of PrEP and could play multiple roles in its implementation. However more effort is needed to meaningfully engage these important stakeholders in PrEP rollout.

## O117

### “MORE THAN FICTION: POZ WOMEN SHARE THEIR STORIES” – ASAAP ANTHOLOGY PROJECT

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In 2013, women of ELAN's support group at ASAAP discussed how to address a lack of representation in the HIV/AIDS movement. Their discussions stemmed from feelings of frustration as they participated in research and focus groups yet, did not see their voices in larger dialogue. This was the impetus for “More Than Fiction”, an anthology of these 12 women's personal narratives.

The project was developed not as a standard research endeavour, although one of its primary goals is to inspire research in narrative writing with a focus on its therapeutic and social outcomes. This project addresses the unique needs of people living with HIV/AIDS.

Eight (8) participants for the project were recruited from ELAN and attended workshops on creative writing and photo art led by two (2) skilled facilitators to help pen their stories for the anthology over a period of four (4) months from May to August 2014.

At the completion of the project in the fall of 2014, “More Than Fiction” was launched with literary and visual design content for presentation and distribution to POZ communities, partner agencies, and service providers. The anthology covers HIV disclosure, treatment adherence, support networks, education, family, sex and sexuality, gender identity, and spiri-

tuality. Its aim is to inform and improve service provision specifically tailored for racialized women living with HIV/AIDS. “More Than Fiction” received much praise from leaders in the HIV/AIDS service and research sectors after its launch. The authors of “More Than Fiction” participated in a focus group where they shared their insights and learning outcomes from the project and expressed the therapeutic and skills-development benefits of writing and sharing their stories.

To date, print copies of “More Than Fiction” have been widely distributed at various community events. An online version is in the works. ASAAP would like opportunities to present and share this unique narrative writing model with the greater HIV/AIDS service and research sectors to help foster positive change in HIV/AIDS service and support provision.

## O118

### THE BENEFITS AND CHALLENGES OF VOCATIONAL REHABILITATION SERVICES IN ASSISTING PEOPLE LIVING WITH HIV TO WORK SUCCESSFULLY: IMPLICATIONS FOR COMMUNITY PRACTICE

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<sup>1</sup>Calgary, AB; <sup>2</sup>Victoria, BC; <sup>3</sup>Toronto, ON

**BACKGROUND:** Due to multiple personal and contextual barriers, labour force participation remains a challenge for many people living with HIV (PHAs) in Canada. Low employment rates have frequently been reported among PHAs following HIV diagnosis. However, improved employment outcomes are associated with receiving effective vocational counselling. Currently, AIDS service organizations are those most involved in the provision of HIV-specific employment supports in Canada, and have been identified as an important resource for services related to vocational rehabilitation. The objectives of this community-initiated study were to explore the benefits and challenges of community vocational rehabilitation services in assisting PHAs to return to the workplace and maintain successful employment.

**METHODS:** The study was conducted with the guidance of a community advisory committee that included PHAs and community service providers. Community-based research methods and grounded theory were used to explore the perspectives of PHAs in Canada who have sustained successful participation in the labour force. Purposive sampling was conducted in the provinces of Ontario, Alberta, and British Columbia. Qualitative, semi structured interviews were conducted with 31 PHAs who were successfully engaged in the labour force.

**RESULTS:** Study findings identified important factors in effective vocational rehabilitation and the role for community-based AIDS service organizations. The results emphasize a dual focus on supporting PHAs at the personal level while also addressing contextual issues. Nine thematic categories summarized the findings related to vocational rehabilitation for PHAs. These include the importance of the GIPA principles; social and emotional support; support groups; skill development; benefits counselling; anti-oppressive practice; peer support; outreach and advocacy; and HIV-specific services.

**CONCLUSIONS:** Study findings call attention to the vocational needs of PHAs in Canada and identify effective strategies that can guide HIV-related vocational service provision and community practice. They also contribute to a growing body of resources available to community service providers interested in addressing HIV and employment. Results will be of interest to those working in community-based AIDS service organizations and those interested in developing effective vocational programming and supportive public policies.



## Basic Sciences: Co-morbidities, Including HCV

## Sciences fondamentales : Comorbidités, dont le VIH-VHC

### BS01

#### GENERALIZED CD8+ T CELL DYSFUNCTION IN HCV MONO- AND HIV-HCV CO-INFECTION WITH PRONOUNCED IMPAIRMENT IN THE LIVER

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**BACKGROUND:** Effective clearance of hepatitis C virus (HCV) requires HCV-specific CD8+ T cells, yet their activity is impaired in chronic HCV (cHCV) infection. Generalized CD8+ T cell dysfunction is also observed, for unknown reasons, with potential effects extending beyond HCV infection. Reduced interleukin-7 (IL-7) receptor alpha (CD127) expression and IL-7 activity contribute to CD8+ T cell impairment in HIV infection, and this may also be the case in cHCV infection and HIV-HCV co-infection.

**RESULTS:** Treatment naïve, cHCV mono-infected and HIV-HCV co-infected individuals (HAART-treated, <50 copies HIV RNA/ul for >1yr) and HIV-, HCV- healthy controls were studied. In cHCV mono-infection, we observed fewer naïve CD8+ T cells (TN) and unchanged bulk-CD8+ T cell CD127 expression, yet reduced CD127 expression on central memory T cells (TCM) in blood compared to controls. Secondly, IL-7 activity was impaired, with lower levels of activated STAT5 (especially TN and TCM), and lower baseline and inducible Bcl-2 expression. This muted Bcl-2 response was associated with higher fibrosis scores. In HIV-HCV co-infection, we observed an increased proportion of effector memory cells in blood, and unchanged CD127 expression compared to controls or cHCV mono-infection. The activity of IL-7 was impaired as in cHCV mono-infection, and IL-7-mediated proliferation was reduced. Cytokine stimulation did not activate STAT5 in liver-CD8+ T cells in cHCV mono-infection and baseline Bcl-2 levels were lower relative to blood-CD8+ T cells in the same individual.

**CONCLUSIONS:** Generalized CD8+ T cell impairment in HCV infection, and its increased severity in HIV-HCV co-infection, is characterized by impaired cytokine signaling and survival, independent of CD127 expression, unlike in HIV infection. This impairment is pronounced in the liver, and fibrosis may contribute to this broad dysfunction. Identifying the underlying mechanisms will facilitate the design of novel immune therapies to complement existing antivirals and improve the health status of those with cHCV infection.

### BS02

#### HIV AND SMOKING ARE ASSOCIATED WITH SHORTER LEUKOCYTE TELOMERE LENGTH IN A COHORT OF PREGNANT WOMEN

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Combination antiretroviral therapy (cART), HIV proteins, and oxidative stress can affect telomerase activity and/or leukocyte telomere length (LTL), a marker of aging and lifespan predictor. We investigated the relationships between pregnancy, HIV, and cART on LTL in HIV+ and HIV- women. HIV+ (n=107) and HIV- (n=68) pregnant women were enrolled in a prospective cohort study. Relative LTL was assessed during pregnancy (13-23, >23-31, and >31-40 weeks of gestation), at delivery and at 6 weeks post-partum for HIV+ women. Mixed-effects regressions were used to examine the relationship between LTL and ethnicity, HIV status, hepatitis C virus (HCV), substance use throughout pregnancy, gestational age (GA) at visit, and preterm delivery. Predictors significantly associated with LTL were included in a multivariate model. Among HIV+ women, CD4 nadir,

CD4 and HIV plasma viral load (pVL) at visit, peak pVL, on/off cART at visit, and duration of cART in pregnancy were also considered.

HIV+ and HIV- women were similar in age (31±6 vs. 31±5 years, p=0.49), but there were fewer Black/African Canadians and HCV+ in the HIV- group (p<0.001). 26% of HIV+ women started cART pre-conception, 74% during pregnancy, and 61% continued post-partum. Univariate, LTL was significantly shorter in HIV+ women (p=0.02) and smokers (p=0.01). Multivariate analysis suggested shorter LTL in smokers (p=0.02), and a significant interaction between HIV status and GA (p=0.01), with LTL unchanging in HIV- women, and increasing in HIV+ women over pregnancy. Among HIV+ women, smoking, higher pVL, and off cART at visit were associated with shorter LTL (all p≤0.001), and time of visit with increasing LTL (p<0.001). Multivariate, HIV+ women who smoked (p=0.005) and those off cART (p<0.001) had shorter LTL.

In the context of pregnancy, HIV+ status and smoking are associated with shorter LTL. Within HIV+ women cART initiation may increase LTL, possibly via reduced inflammation and oxidative stress.

## Basic Sciences: HIV Immunology

## Sciences fondamentales : Immunologie du VIH

### BS03

#### HIV-1 INDUCES INTESTINAL EPITHELIAL CELL DEATH AND INCREASES INTESTINAL PERMEABILITY VIA IMBALANCED PRODUCTION OF IL-18 AND ITS ANTAGONIST

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HIV infection induces a chronic inflammatory state in the infected individuals. At the local level, proinflammatory cytokines disrupt the intestinal barrier function and enhance intestinal permeability. Several researchers have shown increased intestinal permeability and apoptosis of intestinal cells in HIV infected individuals. We and others have shown an imbalanced production of Interleukin (IL)-18 and IL-18 Binding Protein (IL-18BP) in HIV-infected individuals. In this abstract, we show that incubation of HIV-1 with HT29 (Human colon adenocarcinoma grade II cell line) induces IL-18 and reduces IL-18BP production. We tested the effect of IL18 in both HT29 and Caco2 intestinal cell lines. Interestingly we noticed very high destructive effects on HT29 cell cultures after 48h of contact with IL18 as compared with non IL18 treated cells. The cytokine induced death via apoptosis in both HT29 and Caco2 cells, which was dose dependent. This increase in apoptosis was preceded by a concomitant decrease in some intestinal tight junction proteins. IL18 also decreased adherent junction-associated proteins like beta-catenin and disturbed spatial arrangement of F-actin in Caco2 and HT29 cells. Caco2 cells showed a decrease in trans-epithelial electrical resistance (TEER) after treatment by IL18 for 24h. Interestingly, the serum IL-18 concentrations correlated with their LPS contents in HIV-infected individuals. Overall, our results suggest that HIV-induced IL-18 production from human intestinal epithelial cells plays a role in microbial translocation and chronic immune activation in HIV-infected individuals.

### BS04

#### SOLUBLE IL-7 RECEPTOR INCREASE IN PLASMA IS ASSOCIATED WITH IMPROVED THERAPEUTIC OUTCOME TO IL-7 THERAPY IN SIV-INFECTED ART-TREATED RHESUS MACAQUES

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<sup>1</sup>Ottawa, ON; <sup>2</sup>Seattle, WA, USA

**BACKGROUND:** The decreased expression of IL-7 receptor alpha (CD127) and impaired IL-7 signaling in T-cells in chronic viral infections is well established, particularly in HIV infection. The soluble CD127

(sCD127) can be observed in the plasma, however its role in maintaining T cell function or dysfunction is not known. We previously found increased plasma sCD127 levels in untreated HIV infection that remained elevated despite subsequent viral control. The goal of this work was to determine if the immunorestorative effects of IL-7 therapy shown in HIV infection are associated with sCD127 expression.

**RESULTS:** The concentration of plasma sCD127 levels did not change during acute primary SIV infection or in response to antiretroviral (ART, 105 d.p.i) treatment. After the acute infection, macaques were administered recombinant IL-7 (Cytheris) treatments (3 clusters of: 3 weekly IL-7 injections + 2 week reprieve). Treatment with IL-7 frequently increased sCD127 levels in either a transient or persistent (i.e. up to 5 weeks) manner. Before ART, sCD127 levels correlated with increased CD8+ T-cell numbers. Following an IL-7 cluster treatment, sCD127 correlated with increasing CD4+ and CD8+ T-cell numbers. In the IL-7 clusters, as the number of activated (Ki67+) CD4+ or CD8+ T-cells increased, so too did sCD127 concentrations, particularly if sCD127 levels had fallen below assay detection between IL-7 treatment clusters. Finally, the higher levels of sCD127 in IL-7-treated macaques related to the greater retention of proliferating cells (i.e. BrdU uptake), compared to controls.

**CONCLUSIONS:** These data confirm findings from our colleagues demonstrating that IL-7 promotes the release of sCD127. Furthermore, these data demonstrate a parallel relationship between higher levels of plasma sCD127 levels with IL-7-mediated T-cell numbers, activation and survival. This suggests that IL-7 therapy in SIV infection increases sCD127 release. We hypothesize that the endogenous sCD127 plays a role in the observed IL-7 activity, and contributes to viral control *in vivo*.

## BS05

### THE ROLE OF LAG-3 IN HIV-DRIVEN IMMUNE DYSFUNCTION

**Fowke, Keith R; Stalker, Andrew; Graydon, Colin; Kimani, Joshua; Lajoie, Julie; Juno, Jennifer**  
Winnipeg, MB

**BACKGROUND:** The innate immune system becomes dysfunctional during chronic HIV infection and fails to fully reconstitute even during suppressive ART. Restoring full activation and function of these cells during ART may be a crucial component of overcoming viral latency or supporting functional cure approaches. Contact between DCs and T cells expressing inhibitory markers such as PD-1 and Tim-3 can lead to reverse signaling through DC-expressed ligands (like PD-L1/L2) that alters DC maturation and phenotype. The goal of this project is to assess the role of another inhibitory marker, LAG-3, on innate lymphocyte function. The first step is to determine the kinetics and sources of LAG-3 expression.

**RESULTS:** A study of HIV infected and uninfected research participants from Nairobi Kenya were assessed for systemic and mucosal LAG-3 levels. LAG-3 is upregulated on T cells in HIV infection although expression is a low proportion of cells. Invariant NK T cells are innate lymphocytes and have elevated LAG-3 levels that are not recovered following ART. On T cells a kinetic assessment shows that LAG-3 expression occurs within 6 hours of stimulation of the cells. When *de novo* protein synthesis is blocked, LAG-3 expression still occurs within 6 hours.

**CONCLUSION:** LAG-3 is stored in pre-formed intracellular vesicles and is trafficked to the membrane following activation of the T cell. For the cell to invest in the production and storage of LAG-3, this may imply that its function is required very early following activation and that its role is not solely as a marker of exhaustion, rather, is involved in early regulation of the immune response.

## BS07

### CHARACTERIZATION OF B LYMPHOCYTE SUBSETS IN HIV-EXPOSED UNINFECTED CHILDREN

**Gravel, Catherine<sup>1</sup>; Le Campion, Armelle<sup>1</sup>; Raymond-Marchand, Laurence<sup>1</sup>; Boucher, Marc<sup>1</sup>; Lapointe, Normand<sup>1</sup>; Lamarre, Valérie<sup>1</sup>; Kakkar, Fatima<sup>1</sup>; Côté, Hélène C<sup>2</sup>; Soudeyins, Hugo<sup>1</sup>; The CIHR Team on Cellular Aging and HIV Comorbidities in Women and Children (CARMA)<sup>2</sup>**

<sup>1</sup>Montreal, QC; <sup>2</sup>Vancouver, BC

**BACKGROUND:** ~1.4 million HIV-infected women give birth each year, including ~200 in Canada. Antiretroviral therapy can prevent > 98% of

mother-to-child transmissions. As a result, numbers of HIV-exposed uninfected (HEU) children are increasing worldwide. Several groups have reported increased morbidity and mortality in HEU children. Analysis of retrospective data from the CMIS Mother-Child Cohort (705 HEU children) revealed that at 2 months of age, HEU infants born to mothers with HIV-1 viral load >1,000 copies/mL had significantly higher CD19+ B cell frequencies compared with children born to mothers with undetectable viral load, suggestive of immunologic anomalies. The objective of this study was to characterize these abnormalities.

**METHODS:** HIV-infected women were enrolled during the course of pregnancy. Phenotyping of B lymphocytes was performed by multiparametric flow cytometry (CD3/CD10/CD14/CD16/CD19/CD20/CD21/CD27/IgM) in HEU children using samples of umbilical cord blood (UCB; n=8) or venous blood (n=2) obtained at 4-6 months of age. Magnitude of vaccine-elicited antigen-specific B cell responses was estimated by staining with fluorescent tetanus toxoid (TT) oligomers.

**RESULTS:** Decreased frequencies of naïve B cells and increased frequencies of activated memory B cells and plasmablasts were observed between HEU UCB and 4-6 months of life (70.2%±0.07% vs. 58.9%±3.29%, 0.3%±0.0007% vs. 3.7%±1.05%, and 0.3%±0.0022% vs. 1.6%±1.12%). Conversely, frequencies of classical memory and atypical memory B cells (CD19+CD10-CD27-CD20+CD21-/low) were unchanged. TT-specific B cells were detected at 4-6 months of life but not in UCB. TT oligomer-positive cells represented 1.6% of class-switched plasmablasts and 0.2% of class-switched classical memory B cells, compatible with vaccine-elicited B cell responses in HEU children.

**CONCLUSIONS:** Results from this study provide a high-resolution portrait of antigen-specific B cell responses and immunocompetence in HEU children, which could significantly impact clinical management of these patients. Whether these responses are influenced by the clinical picture observed in the mother will need to be validated.

## BS08

### DEFINING THE ROLES OF IRF-1 AND IRF-7 IN ANTI-VIRAL RESPONSES

**Harris, Angela; Ball, T B; Su, Ruey-Chyi**  
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**INTRODUCTION:** The interferon regulatory factor (IRF) family members are regulators of many biological processes such as cytokine signalling, immune response, and apoptosis. Both IRF-1 and IRF-7 have been shown to regulate anti-viral immune response via regulating the expression of type 1 and 2 interferons and interferon-stimulated-genes. We hypothesize that increased cellular expression of IRF-1 or IRF-7 will boost anti-viral responses and reduce viral replication in infected cells. Conversely, reducing cellular IRF-1 or IRF-7 will render the cells more susceptible to infection, with the exception of HIV-1.

**METHODS:** IRF-1 and IRF-7 level were examined in defined immune subtypes in blood using multi-color flow-cytometry. IRF-1 and IRF-7 levels in ex-vivo human T cells and monocytes were modulated by transfection with either plasmids or siRNA. The outcomes were assessed by the efficiency of transactivating HIV-1 genes (p24 ELISA and Gag mRNA) and host cell anti-viral genes.

**RESULTS:** Without stimulation, preliminary data showed that IRF-1 was expressed in all cellular subtypes examined (CD-4, CD-8, B-cells, NK cells, monocytes, and dendritic cells) with the highest expression found in monocytes. In response to exogenous interferon-gamma (IFN-gamma) stimulation, IRF-1 protein level was increased by ~2-fold. In contrast, IRF-7 was expressed at low levels in unstimulated cells, and its expression was augmented by ~3-fold in IFNαA-treated cells. Our preliminary work showed that as little as 30% knockdown of endogenous IRF-1 level resulted in >90% reduction in transcription of HIV-1 genes and consequently impaired viral replication. Such modest IRF-1 knockdown had no effects on the transactivation of host anti-viral genes.

**SUMMARY:** Fine-tuning the expression of immune regulators is critical, as modest reduction in IRF-1 expression significantly impaired the transactivation of HIV genes, but not the regulation of host genes. Findings from this study will define the roles of IRF-1 and IRF-7 roles in anti-viral responses assisting in vaccine design.

**BS09****SHORTER TELOMERES IN PROLIFERATIVE CD8+CD28+ T CELLS MAY CONTRIBUTE TO HIV-MEDIATED IMMUNOSENESCENCE****Hsieh, Anthony; Sattha, Beheroze; Côté, Hélène C**  
**Vancouver, BC**

**BACKGROUND:** The link between HIV infection and age-related immunosenescence is primarily supported by lymphocyte immunologic abnormalities. In untreated infection, these include shorter telomeres in the inflated senescent CD8+ T cell compartment, and increased CD4+/CD8+ ratio. This HIV-mediated immunosenescence may manifest in early-onset age-related comorbidities in cART-treated people. The relationship of telomere length (TL) in specific blood cell subsets to HIV immunosenescence is unclear. Our objective was to investigate TL in several lymphocyte subsets, and its relation to HIV clinical factors.

**METHODS:** This pilot study involved 33 HIV+ subjects and 10 HIV-controls enrolled in the CARMA cohort. Live PBMCs were sorted for CD4+, senescent CD8+CD28-, and proliferative CD8+CD28+ T cells using FACS. QPCR was used to measure relative TL in each of the cell subset with sufficient count. Results were analyzed by two-tailed Mann-Whitney, Spearman's correlation, and ANCOVA.

**RESULTS:** Consistent with previous research, the HIV+ group presented an expanded senescent CD8+CD28- compartment (n=43, 39 vs 17% of total T cells, p=0.02) and a decreased CD4+/CD8+ ratio (n=43, median 0.24 vs. 1.75, p<0.001) compared to the HIV- group. Overall, older age was associated with shorter TL in proliferative CD8+CD28+ (n=27, R=-0.47, p=0.01) but not senescent CD8+CD28- T cells (n=29, R=-0.06, p=0.77). Proliferative CD8+CD28+ T cells TL in the HIV+ group (n=19, median[IQR] 3.35[2.63-3.93]) was shorter than in HIV-individuals (n=8, 3.73[3.48-4.08]) and this difference was statistically significant after controlling for age (p=0.02). In contrast, TL in senescent CD8+CD28- T cells (n=22 HIV+ 2.48[2.18-3.16] and n=7 HIV- 2.32[2.15-2.84], p=0.56), or CD4+ T cells (n=18 HIV+ 3.76[3.21-4.14] and 8 HIV- 3.43[2.96-3.57], p=0.53) were not statistically different in both groups.

**CONCLUSIONS:** Our results suggest that proliferative CD8+CD28+ T cells TL are affected by age as well as HIV, highlighting the relevance of this compartment in studies of HIV-mediated immunosenescence.

**BS10****MITOCHONDRIAL DNA OXIDATIVE DAMAGE IN SORTED CD8+ T CELLS MAY BE LINKED WITH COMBINATION ANTIRETROVIRAL THERAPY EXPOSURE****Hsieh, Anthony; Sattha, Beheroze; Côté, Hélène C**  
**Vancouver, BC**

**BACKGROUND:** HIV is linked with markers of cellular aging such as shorter leukocyte telomere length and an inflated senescent CD8+CD28- T cell subset. HIV and/or cART are also suggested to increase mitochondrial DNA (mtDNA) mutations. Oxidative stress leads to nuclear telomerase recruitment to mitochondria where it may protect mtDNA against oxidative damage and possibly mutation, linking the roles of telomerase and mitochondria in cellular aging. Our objective was to measure mtDNA apparent oxidative damage (AOD) in sorted lymphocyte subsets from HIV+ and HIV- individuals, and explore its putative relationships with cART exposure, clinical, and demographic factors.

**METHODS:** In this pilot study, live PBMCs were collected from 33 HIV+ subjects and 10 HIV- controls enrolled in the CARMA cohort. Proliferative CD8+ CD28+ and senescent CD8+ CD28- T cells, along with CD19+ B cells were separated by FACS. QPCR was used to measure mtDNA AOD in all subsets with adequate cell count. Data analysis was performed using Spearman's correlation and two-tailed Mann-Whitney tests.

**RESULTS:** No significant relationship was seen between mtDNA AOD and HIV or age in the studied subsets. HIV viral load was associated with decreased mtDNA AOD in CD19+ B cells (n=16, R=-0.71, p=0.006). A possible positive relationship between mtDNA AOD and lifetime cART duration was seen in both proliferative CD8+CD28+ and senescent CD8+CD28- T cell subsets (n=22, R=0.53, p=0.01, and n=22, R=0.45, p=0.04).

**CONCLUSIONS:** These preliminary results may point toward turnover of CD19+ B cells with viremia-damaged mtDNA, potentially resulting in

the selection of cells with less mtDNA damage. The association between lifetime cART duration and mtDNA AOD in both CD8+ subsets reinforces the concept that cART may play a role in exacerbating lymphocyte aging. Future work will involve measuring mtDNA AOD in HIV slow-progressors not on treatment to further evaluate the role of cART on mtDNA oxidative damage.

**BS11****NKG2A+3DL1- NK CELLS HAVE STRONGER RESPONSES AGAINST AUTOLOGOUS HIV+ CD4 CELLS THAN NKG2A-3DL1+****Lisovsky, Irene; Isitman, Gamze; Song, Rujun; DaFonseca, Sandrina; Tremblay-McLean, Alexandra; Lebouché, Bertrand; Routy, Jean-Pierre; Bruneau, Julie; Bernard, Nicole F**  
**Montreal, QC**

**BACKGROUND:** Carriage of certain NK cell receptors (NKR) and their HLA ligands is associated with slow time to AIDS in HIV+ subjects and protection from infection in HIV-exposed seronegative subjects, implicating NK cells in HIV control. NK cells acquire anti-viral functions through licensing, which requires signals from inhibitory NKR (iNKRs), such as NKG2A and KIR3DL1 (3DL1), engaging their ligands. NKG2A interacts with HLA-E presenting HLA-I leader peptides; 3DL1 interacts with Bw4+ HLA-A and B antigens. HIV infected cells can activate NK cells by down-regulating HLA-A/B ligands for some iNKR and upregulating ligands for activating NKR. We studied the impact of NKG2A and 3DL1 expression on NK function in response to autologous HIV-infected CD4 cells (iCD4). We hypothesized that the NKG2A+3DL1+ subset would have higher functional potential and greater responsiveness to iCD4.

**METHODS:** We studied 24 HIV- subjects. The functional potential of NKG2A±3DL1± populations was assessed by simulating PBMCs with HLA-null cells. Responses to HIV were assessed by co-culture of NK cells with autologous iCD4. Flow cytometry was used to gate on NKG2A±3DL1±populations with all possible combinations of CD107a, IFNγ, and CCL4 functions by boolean gating.

**RESULTS:** NKG2A+3DL1+ NK cell population had the highest functional potential (p<0.0001). iCD4 cells induced differential frequencies of total-responsiveness, tri-functional (CD107a+IFNγ+CCL4+), CD107a+IFNγ+ and CD107a+ responses in the NKG2A±3DL1± populations (p≤0.008). iCD4 stimulated a significantly higher frequency of NKG2A+3DL1- than NKG2A-3DL1+ or NKG2A-3DL1- NK cells with the CD107a+IFNγ+CCL4+, CD107a+IFNγ+ and CD107a+CCL4+ and total CD107a and IFNγ functional profiles (p≤0.03).

**CONCLUSIONS:** Detecting the highest functional potential in the NKG2A+3DL1+ population is in line with licensing through two iNKRs. Observing the greatest response to iCD4 cells in the NKG2A+3DL1- population may suggest that NKG2A+ NK cells have a role superior to those that are 3DL1+ in NK cell mediated anti-HIV immunity.

**BS12****INTERLEUKIN-7 DRIVES TCR-ACTIVATED NAIVE CD8 T CELLS TO AN EFFECTOR PHENOTYPE****MacPherson, Paul; Faller, Elliott**  
**Ottawa, ON**

While constitutive IL-7 expression regulates T cell homeostasis, following infection IL-7 levels increase and contribute to CTL activity. As a result, decreased IL-7 receptor (CD127) expression on CD8 T-cells evident in HIV+ individuals may not only reduce cell survival but may also impair naïve CD8 T cell activation in response to foreign antigens. A better understanding of IL-7's role in the immune response and its de-regulation in HIV infection is essential to understanding HIV-induced immune suppression.

To investigate IL-7's role in T cell activation, naïve CD8 T cells were isolated from PBMC of healthy donors and stimulated in vitro with anti-CD3/anti-CD28 beads ± IL-7. Although IL-7 alone had no effect on any surface marker measured with the exception of CD127, IL-7 significantly enhanced many TCR induced phenotypic changes including up regulation of CD25, CD56, CTLA4, CD69, HLADR, CCR7, CD8, TIM3, PD1 and PDL1. IL-7 also increased Ki-67 expression and enhanced TCR induced proliferation as measured by CFSE dilution over 7 days. Although IL-7 alone did not induce IFNγ or perforin in naïve CD8 T cells, IL-7 sig-



nificantly enhanced production of these cytotoxic molecules in the presence of TCR stimulation. Interestingly while T-bet expression was only transiently induced by TCR stimulation, in the presence of IL-7 TCR-induced T-bet expression was sustained suggesting IL-7 may induce a specific subset of cytotoxic CD8 T cells. Of particular note, IL-7 induced expression of Bcl2 was completely blocked by TCR activation consistent with the apparent differentiation of pro-apoptotic effector cells. Given the role IL-7 plays in driving differentiation of naive CD8 T cells to an effector phenotype, decreased IL-7R expression in HIV+ individuals most likely limits cell mediated immune responses to a variety of pathogens including HIV itself. Restored IL-7 signaling and recovered CTL activity may then be an important pathway to establishing a cure.

### BS13

#### MYELOID CELLS AND IMMUNE DYSFUNCTION IN LONG-TERM TREATED HIV INFECTION: AVENUES FOR IMMUNOTHERAPEUTIC TARGETS

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Montreal, QC

**INTRODUCTION:** Myeloid cells including macrophages, monocytes, dendritic cells (DCs) and neutrophils contribute significantly to immune dysfunction in the context of treated HIV infection. Recently in long-term treated patients, the myeloid-associated inflammatory markers such as sCD14, CD16+ monocytes and tryptophan catabolizing enzyme IDO-1 activity better predict disease progression and mortality than T cell markers.

**METHODS:** We systematically reviewed 81 publications indexed on PubMed database from 2009-2015 using the multiple combinations of key words: 'HIV' and 'myeloid cells, monocytes, macrophages, dendritic cells and neutrophils'. We also summarized the ongoing clinical trials registered on www.ClinicalTrials.gov evaluating immunotherapeutic interventions with a focus on myeloid cells.

**RESULTS:** The role of myeloid cells in HIV infection is reviewed and depicted as an integrated vicious cycle of inflammation involving monocytes, macrophages, DCs, neutrophils and T cells. Functional polarization and plasticity of macrophages into M1/M2 has significant implications. Myeloid-derived suppressor cells open up new avenues of research on immune dysfunction.

Recent evidence indicates that innate immune response can be "trained" to become adaptive. Such changes are linked in myeloid cells to a shift of central glucose metabolism from oxidative phosphorylation to aerobic glycolysis (the "Warburg effect") fulfilling the high energy demand for rapid proliferation in the context of cancer and viral infections. The interaction of programmed death-1 (PD-1), an important regulator of T cell function, with its ligand PD-L1 on myeloid cells has a major impact on immune dysfunction. The recent commercialization of inhibitors of PD-1 and CTLA-4 pathways in oncology is paving the way for immune-based therapies in treated HIV infection.

**CONCLUSION:** This systematic literature review indicates a very important link between metabolism and immune response driven by myeloid cells highlighting the immunotherapeutic targets. Further studies aimed to understand and modify myeloid cell immune check points will contribute to the development of novel interventions for viral eradication.

### BS14

#### INFLUENCE OF COMPOUND HLA CLASS I AND INHIBITORY KIR GENOTYPES ON MOTHER-TO-CHILD TRANSMISSION OF HIV-1

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Montreal, QC

**BACKGROUND:** The activation state of natural killer (NK) cells, which function in antiviral immunity, is regulated by activating and inhibitory receptors. Previous work from our group found that carriage of the Killer Immunoglobulin-like Receptor (KIR) 3DS1 homozygous (3DS1hmz) genotype and the combination of the high expression KIR3DL1 homozygous (\*h/\*y) genotype with its HLA-B\*57 ligand (\*h/\*y+B\*57) was associated with protection from HIV infection in a cohort of injection drug users (IDU). Additionally, others reported that alloreactive KIR/KIR-ligand mismatched combinations were associated with protection

from heterosexual HIV transmission in HIV discordant couples. Here, we investigated whether these KIR/HLA genotype combinations maintain protection in the context of mother-to-child transmission (MTCT).

**METHODS:** We studied 61 HIV-1 seroconcordant and 64 serodiscordant mother-infant pairs. DNA for HLA and KIR geno- and allotyping was extracted from dried blood spots. All samples were typed for HLA-C, while infants alone were typed for HLA-B, KIR3DL1 generic genotypes, and the presence of KIR2DL1, KIR2DL2, and KIR2DL3 genes. 4-position HLA typing was used to classify the HLA-B and -C antigens as Bw4/Bw6 and C1/C2. Bw4 antigens are ligands for KIR3DL1, C1 for KIR2DL2/3, and C2 for KIR2DL1.

**RESULTS:** The frequency of the protective 3DS1hmz and \*h/\*y+B\*57 genotypes was not significantly different between infected (INF) and exposed uninfected (EU) children. Moreover, INF and EU children did not differ significantly in the frequency of KIR2DL1/KIR2DL2/KIR2DL3, HLA-C1/C2, or KIR/maternal KIR-ligand mismatched combinations.

**CONCLUSIONS:** Due to the ethnic composition of the MTCT cohort, the frequency of the 3DS1hmz and \*h/\*y+B\*57 genotypes was low, reducing our power to observe significant inter-group differences had they existed. Several aspects of the biology of MTCT could account for the inability to translate the observed protective effects of certain KIR/HLA combinations. These findings highlight the unique characteristics of vertical HIV-1 transmission and the need for further research in this field.

### BS15

#### IDENTIFICATION AND MOLECULAR CHARACTERISATION OF TWO NEW TH17 SUBSETS WITH DISTINCT CONTRIBUTION TO HIV-1 PERSISTENCE UNDER ART

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Montreal, QC

**BACKGROUND:** Th17 cells maintain mucosal immunity against pathogens. Human Th17 cells were previously reported to express CCR6 and CCR4 (CCR4+Th17) or CXCR3 (CXCR3+Th1Th17). During HIV-1 infection, Th17 cells are depleted from the gut-associated lymphoid tissues and their restoration under ART is only partial. We identified two previously uncharacterized CCR6+ subsets: CCR4-CXCR3- (double negative; CCR6+DN) and CCR4-CXCR3+ (double positive, CCR6+DP) expressing the Th17-specific transcription factor RORC. In contrast to CCR4+Th17, CXCR3+Th1Th17 and CCR6+DP, the frequency of CCR6+DN was preserved in the peripheral blood of HIV-infected subjects on ART. We investigated functional and transcriptional differences between the four CCR6+ subsets and tested their permissiveness to HIV infection in vitro and in vivo.

**METHODS:** Memory T-cell subsets were sorted by flow cytometry. Cytokine profiles were investigated upon TCR triggering in vitro. Antigenic specificity was determined by measuring T-cell proliferation. Genome-wide transcriptional profiling was performed using the Illumina technology. HIV integration was measured by real-time PCR.

**RESULTS:** CCR6+DN and CCR6+DP from HIV-uninfected subjects produced IL-17A similar to CCR4+Th17 and CXCR3+Th1Th17, respectively. CCR6+DN distinguished by their superior IL-17E, IL-21 and IL-8 production. Similar to CCR4+Th17, CCR6+DN proliferated in response to *Candida albicans* hyphae but not CMV. Although they shared known molecular Th17 markers, CCR6+DN, CCR6+DP and CCR4+Th17 expressed specific molecular signatures thus, reflecting the heterogeneity of memory Th17 cells in humans. Similar to CCR4+Th17 and CXCR3+Th1Th17, CCR6+DN and CCR6+DP were permissive to HIV in vitro and carried integrated HIV-DNA in HIV-infected subjects. CCR6+DN represented the most predominant Th17 subset in HIV-infected subjects on ART and uninfected controls.

**CONCLUSION:** Our results reveal the existence of four transcriptionally distinct Th17 subsets in humans and suggest a major contribution of CCR6+DN to HIV persistence under ART. Understanding mechanisms allowing the preservation of CCR6+DN in HIV-infected individuals will be critical for designing new intelligent cell-specific HIV eradication strategies.



**BS16****PRIMARY CD4 SUBSETS ARE SIMILARLY LOADED BY TENOFOVIR ALAFENAMIDE**

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<sup>1</sup>Foster City, CA, USA; <sup>2</sup>Mississauga, ON

**BACKGROUND:** Tenofovir alafenamide (TAF), a new prodrug of the HIV-1 NRTI, tenofovir (TFV), shows improved antiviral activity in monotherapy clinical studies, at lower doses than tenofovir disoproxil fumarate (TDF). TAF delivers TFV more efficiently than TDF to lymphoid cells with a 5-fold increase in intracellular TFV-diphosphate (TFV-DP) level and a 90% reduction in plasma TFV. To evaluate TFV-DP distribution among primary human CD4<sup>+</sup> T-lymphocytes (CD4) subsets following TAF treatment, intracellular TFV-DP levels were evaluated in CD4 subsets at clinically relevant TAF concentrations.

**METHODS:** TAF loading studies were conducted using primary cells from healthy human donors. PBMCs, total CD4, naïve, effector, central memory and effector memory CD4 T-cell subsets were evaluated. Loading was evaluated using a 2 h pulse incubation followed by washout and then incubation in drug-free media mimicking in vivo TAF exposure. Cell extracts were prepared and TFV, TFV-MP, and TFV-DP levels were measured by LC/MS/MS.

**RESULTS:** Cell loading studies in PBMCs demonstrated that a 2 h pulse and 22 h washout of 200-400 nM TAF achieved TFV-DP levels comparable to those observed in vivo following clinical TAF dosing. There was minimal variation in intracellular TAF metabolites between donors. Additionally, comparable TFV-DP levels were achieved after a 2 h pulse with either 200 or 400 nM TAF in total CD4, and CD4 subsets, with a trend for higher TFV-DP levels in memory cells compared to other CD4 subsets. For each CD4 subset evaluated, there was no significant decrease in TFV-DP levels at 24 h, indicating a long intracellular half-life in all cell populations.

**CONCLUSIONS:** The sustained levels of TFV-DP 24 h post-treatment suggest high levels of TFV-DP will be maintained across most CD4 cell subsets in patients receiving TAF. The higher levels in memory subsets may have implications for maintaining viral suppression in latent viral reservoirs and for future cure efforts.

**Basic Sciences: HIV Molecular Epidemiology, Including Host Genetics and HIV Evolution**

**Sciences fondamentales : Épidémiologie moléculaire du VIH, y compris la génétique des hôtes et l'évolution du virus**

**BS17**

**GENETIC DIVERSITY AND ANTIRETROVIRAL DRUG RESISTANCE AMONG DRUG-NAÏVE HIV TYPE 1 INFECTED PATIENTS ATTENDING CLINICS IN KINSHASA, DEMOCRATIC REPUBLIC OF CONGO**

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**BACKGROUND:** The widespread use of antiretroviral (ARV) created the emergence of mutant strains resistant to treatment. Thus, the World Health Organization recommends epidemiological monitoring for newly infected patients with HIV. The objective of this work is to determine the genetic diversity of HIV Type 1 and the prevalence of mutations associated with resistance to ARV in treatment-naïve patients in Kinshasa.

**METHODS:** One hundred fifty-three subjects diagnosed positive for HIV Type 1 by serology voluntarily participated in this work. They were recruited in different centers of Kinshasa. The inclusions were performed from August 2013 to February 2014. Five milliliters (5 mL) of blood were collected in a tube with EDTA anticoagulant. Plasma was sent for analysis to the AIDS Reference Laboratory of the University Hospital of Liège

(CHU-Liège) in Belgium. RNA was extracted from plasma 140 µL using the QIAamp RNA Mini Kit QIAGEN®. A Reverse Transcriptase PCR and Nested PCR enabled amplification of regions of interest on the Protease and Reverse Transcriptase (RT) for subsequent sequencing.

**RESULTS:** The mean age of patients was 37 years, ranging from 18 to 65 years. The median values of Viral Loads (VL) and rate of CD4 lymphocytes were respectively 5.68 log<sub>10</sub> RNA copies/mL and 180 cells/mL. Protease and RT were amplified and sequenced, respectively, for 130 (84.9%) and 145 (94.8%) patients. Subtype A was dominant with 35 cases (22.9%); followed by CRF02\_AG (11.1%), C (9.8%), G (9.8%), K (9.8%), D (7.8%), H (7.8%) and J (5.0%).

**CONCLUSION:** The results of our study confirm the high diversity of HIV Type 1 in Kinshasa. It reveals the heterogeneity of the virus and the presence of transmitted resistance associated with antiretroviral drugs. Several minor and major resistances associated with Protease Inhibitors, as well as mutations associated with the Reverse Transcriptase Inhibitors have been detected in antiretroviral treatment-naïve patients.

**BS18**

**GENE REGULATION BY FREM1 ISOFORM 2 (TILRR) AND ITS POTENTIAL ROLE IN HIV-1 VAGINAL INFECTION**

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Winnipeg, MB

FREM1 transcript variant 2 (TILRR) is a novel regulatory component, which stimulates host defense against infection through binding of IL-1R1 and TLR complex and enhancing the recruitment of MY88 in the Ras-dependent NFκB signal transduction pathway. Our previous study has identified FREM1 as a novel candidate gene in resistance and susceptibility to HIV infection in the Pumwani Sex worker cohort. In this study we investigated the effect of TILRR on gene expression of several important signal transduction pathways by overexpressing it in the HeLa cells. TILRR was overexpressed in HeLa cells using eGFP tagged plasmid construct. Transfection efficiency was determined by fluorescence microscopy and flow cytometry. TILRR RNA overexpression was confirmed by qRT-PCR. The effect of TILRR on the expression of 252 genes in important signal transduction pathways was subsequently investigated by qRT-PCR with 3PCR arrays (Human signal transduction, extracellular matrix and transendothelium migration, and MAPKinase). Overexpression of TILRR significantly upregulated 64 genes, and downregulated 69 genes (p<0.001) in MAPKinase, transendothelium migration and NFκB pathways. These findings are novel. Pathway studio analysis showed that some of the most significant upregulated genes directly influence gene expression and inflammatory responses. Although how TILRR influence the expression of these genes need to be investigated, our study is the first to show that TILRR may direct influence gene expression in addition to its role in enhancing NFκB and inflammatory responses. Because transendothelium migration, NFκB and inflammatory response pathways are extremely important in HIV vaginal transmission, further study of the role of TILRR in gene regulation may identify novel targets and develop intervention technology against HIV-1 vaginal infection.

Keywords: TILRR, HeLa Cells, NFκB pathway, Inflammatory response, HIV-1, Women, PSWC.

**BS19**

**DIFFERENTIAL INTRAHOST HIV-1 EVOLUTION REVEALED BY ANCESTRAL PHYLOGENETIC RECONSTRUCTION IN A RARE CASE OF TRANSMISSION OF CXCR4-USING HIV**

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**BACKGROUND:** A putative transmission of CXCR4-using HIV from a CCR5wt/wt donor to a homozygous CCR5Δ32/Δ32 recipient was retrospectively identified in the Vancouver Injection Drug Users Study (VIDUS) via phylogenetic analysis. We apply phylogenetic reconstruction methods to longitudinal intrahost deep-sequence data to characterize HIV transmission and evolution in this rare event.

**METHODS:** Donor and recipient bulk plasma HIV gag, pol, nef, and env-V3 sequences exhibited the lowest overall pairwise genetic distances in

VIDUS. The transmission date estimated from clinical data was Aug/01. Donor plasma/PBMC were available at -13, -7, -1, and +35 months from transmission; recipient plasma/PBMC were available +5, +6, and +12 months from transmission. Env-V3 from plasma-RNA and PBMC-DNA were triplicate amplified, pooled equally and deep-sequenced (Roche 454). BEAST and HyPhy were used to reconstruct phylogenies, estimate multiplicity of infection and reconstruct transmitted/founder (T/F) viruses from plasma-derived deep sequences from donor and recipient.

**RESULTS:** Despite infection with the same X4 HIV strain, the donor's nadir CD4 count was 20 cells/mm<sup>3</sup> within 1.5 years of infection whereas the recipient's remained >270 cells/mm<sup>3</sup>. Donor/recipient plasma viral loads were comparable (~4.5 Log). All 10 ancestral reconstructions were consistent with transmission of a single X4 virus between May-Aug 2001. The estimated T/F virus sequence was identical to the co-dominant variant (36%) observed in the recipient's first (+5 month) timepoint. This sequence was also observed in 0.16% of donor plasma and 33.5% of PBMC at month -1, suggesting minority variant transmission. In the donor, replacement of the dominant V3 sequence with a R25G variant, signifying a gradual reversion of X4 to R5 HIV-1. In contrast, the recipient's dominant V3 sequence was quickly replaced by R25K and others, but remained consistently X4.

**CONCLUSION:** Results highlight the power of phylogenetic reconstruction applied to deep-sequence data to estimate the number and sequence of T/F viruses and characterize intrahost evolution in donor/recipient pairs. Differential CD4 depletion and V3 evolution of a near-identical X4 virus in genetically distinct individuals underscores the impact of host genetics on HIV evolution/pathogenesis.

## BS20

### PREVALENCE AND CLINICAL IMPACTS OF HIV-1 INTERSUBTYPE RECOMBINANTS IN UGANDA

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**INTRODUCTION:** Few epidemiological and clinical outcome data exist for HIV-1 intersubtype recombinants in rural African communities. The objective of this study is to estimate prevalence, examine time trends, and test for clinical correlates and outcomes associated with HIV-1 intersubtype recombination in Mbarara, Uganda, where HIV-1 subtypes A1 and D co-circulate.

**METHODS:** Near-full-genome HIV-1 RNA population sequence data was collected using nested PCR targeting gag to nef as five amplicons followed by Sanger sequencing from n=504 treatment-naïve individuals enrolled between 2005-2010 in the Mbarara-based UARCO cohort, who then received PI or NNRTI-containing regimens and were monitored until 2013. HIV-1 subtypes were inferred by Los Alamos RIP 3.0 (window size 400). Statistical significance was defined as p=0.003 after Bonferroni correction.

**RESULTS:** When each genomic region was individually examined, intersubtype recombinants were detected most frequently in the vif-vpu region (24%), followed by GP41 (18%), gag (15%), prrt (10%), int (8%), nef (4%). Of the 200 patients that had sequence data for all seven genomic regions examined, prevalence of intersubtype recombination was 46%. The most frequently observed recombinant was A1-D (25%). Phylogenetic analysis by maximum-likelihood tree of the 200 near-full-genome sequences showed that A1-D recombinants did not share a common ancestor and suggested multiple recombination events. Stratification by year shows no temporal trend (all p>0.1). Subjects infected with non-recombinants versus recombinants were not significantly different in baseline viral load (p=0.7), baseline CD4 count (p=0.2), time to suppression <=400 copies/mL (p=0.03), time to post-suppression virologic rebound (p=0.1), and time to CD4 recovery defined as baseline+200 or above 350 cells/μL (p=0.6).

**CONCLUSION:** Intersubtype recombination is common in Uganda but it was not associated with baseline viral load nor CD4 count and did not impact treatment outcomes. HIV-subtyping for clinical records and/or association studies should be annotated with the name of the gene used for subtyping.

## BS21

### QUANTIFYING WITHIN-HOST HIV ADAPTATION BY LONGITUDINAL DEEP SEQUENCING OF GAG AND NEF

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**BACKGROUND:** Next-generation sequencing (NGS) may offer a new resource for studying HIV adaptation within hosts by quantifying the prevalence of minority species. We evaluated the potential of this application using longitudinal samples from individuals in the British Columbia Drug Treatment Program.

**METHODS:** HIV RNA was extracted from plasma samples from 43 individuals, one pre-therapy (viral load ≥5×10<sup>4</sup> copies/mL) and a second taken ≥90 days after therapy start. HLA genotypes were determined by sequence-based typing. Gag and nef were amplified by nested RT-PCR. Amplicons were processed by Nextera XT paired-end library preparation for the Illumina MiSeq. Short-read data were processed with a custom pipeline using Bowtie2 for iterative mapping to an adaptive reference. We used Pearson's  $\chi^2$  test to identify sites with significant changes in amino acid frequency distributions within hosts. "Known" HLA associations were taken from Brumme et al. (2009; PLoS ONE:e6687).

**RESULTS:** Median short-read coverage per sample was 7,236 and 9,181 for gag and nef, respectively. The number of significantly evolving amino acid sites (Y) was significantly higher in nef and was associated with time between samples (binomial regression, z=3.5, P=4.5×10<sup>-4</sup>) and mean viral load (z=3.1, P=0.002); this multivariate regression explained 16% of variation in Y. Median proportions of Y with known HLA associations were 56% (gag) and 85% (nef). Direction of amino acid frequency change was significantly associated with adaptive versus non-adaptive HLA associations for individuals with matching HLA alleles (odds ratio OR=3.4, P=4.7×10<sup>-11</sup>), but not significant for non-matching HLA alleles (P=0.2).

**CONCLUSIONS:** Trends in within-host HIV adaptation quantified by NGS correspond well to documented HIV-HLA associations from population-based studies. However, substantial numbers of evolving sites lacked "known" HLA associations; these are candidates for studying host-specific adaptation at the individual level, for example due to HLA alleles too uncommon for associations to be detected at the host population level.

## BS23

### DEVELOPMENT OF FLAGELLIN AS A GENE-BASED VACCINE ADJUVANT FOR HIV-1 GP41 MPER

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**BACKGROUND:** The membrane-proximal external region (MPER) of HIV-1 gp41 harbors conserved epitopes recognized by HIV-1 broadly neutralizing monoclonal antibodies and is thus a target for vaccine development. However, the MPER has proven to be poorly immunogenic and MPER-specific neutralizing antibodies are difficult to elicit. Flagellin is a toll-like receptor 5 (TLR5) agonist under intensive scrutiny as a vaccine adjuvant. We investigated its potential as a gene-based vaccine adjuvant for gp41 MPER.

**HYPOTHESIS:** A flagellin/gp41 MPER fusion protein, encoded by a gene-based vaccine, will trigger TLR5 agonist activity, maintain gp41 MPER antigenicity and elicit a greater magnitude of gp41-specific humoral responses upon immunization relative to a vaccine expressing gp41 MPER alone.

**METHODS:** We designed and produced flagellin/gp41 MPER fusion proteins using a mammalian expression system. Based on secretion, TLR5 agonist activity and gp41 MPER antigenicity, we selected a candidate fusion protein to be delivered by DNA vaccine and carried out mouse immunization studies.

**RESULTS:** We demonstrate that the insertion position of gp41 MPER within flagellin greatly affects the resulting fusion protein's secretion, TLR5 agonist activity and gp41 MPER antigenicity. A DNA vaccine expressing one candidate fusion protein elicited a modest gp41 MPER-specific humoral response which was of at least ten-fold greater magnitude than that elicited by a DNA vaccine expressing gp41 MPER alone.

**CONCLUSION:** Flagellin can augment the immunogenicity of HIV-1 gp41 MPER when delivered as a flagellin/gp41 MPER fusion protein.

Gene-based vaccines expressing flagellin/gp41 MPER fusion proteins are thus promising platforms for HIV vaccine development.

## BS24

### THE DOLUTEGRAVIR-RESISTANCE MUTATION R263K CANNOT CO-EXIST IN COMBINATION WITH MANY CLASSICAL INTEGRASE INHIBITOR RESISTANCE SUBSTITUTIONS

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**BACKGROUND:** When treated with the new integrase inhibitor (INI) dolutegravir (DTG), patients previously treated with older INIs have lower response rates than other patient populations but are unable to develop the DTG resistance mutation R263K. We investigated whether the presence of classic INI resistance mutations preclude the emergence of R263K.

**METHODS:** We grew HIV-1 with different classic INI resistance mutations in cord blood mononuclear cells over protracted periods, with the concentration of DTG being incrementally increased. We then assessed the activity of purified recombinant integrase (INB) biochemically and the infectivity of NL4.3 virus in tissue culture, both harbouring the classic mutations in combination with R263K.

**RESULTS:** Each combination reduced the strand transfer activity of INB relative to INBwt or INBR263K and only INBQ148R/R263K had increased resistance to DTG biochemically. The NL4.3IN(Y143R/R263K) and ~NL4.3IN(Q148R/R263K) viruses grew very poorly in tissue culture, however the addition of N155H to R263K partially restored the infectious defect of the R263K mutant, while increasing DTG resistance compared to either single mutant. The NL4.3IN(E92Q/R263K) virus had increased DTG resistance relative to E92Q-containing virus alone, but the combination negatively impacted infectivity. Both the E92Q- and N155H-containing viruses were also able to select for R263K under DTG pressure.

**CONCLUSIONS:** On most accounts, the combination of classic INI resistance mutations with R263K did not lead to increased fitness or drug resistance. The combination of N155H and R263K, however, does represent a possible mechanism through which resistance may develop. This combination was recently identified in an INI-experienced patient failing an older INI, and the N155H pathway is increasingly being associated with DTG failure in the clinic. These results suggest that two prominent DTG resistance pathways are complementary in vitro. This will have significant implications for the treatment of HIV-positive individuals as DTG becomes more common in clinical settings.

## BS25

### THE ADDITION OF THE R262K MUTATION TO THE H51Y MUTATION IN HIV-1 INTEGRASE SUBTYPE B CONFERS LOW-LEVEL RESISTANCE AGAINST DOLUTEGRAVIR

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**BACKGROUND:** Clinical studies have shown that integrase strand transfer inhibitors (INSTIs) can be used effectively against HIV-1 infection. To this day, no resistance mutation has been found in INSTI-naïve patients who were treated with the second-generation inhibitor dolutegravir (DTG). In a recent selection study with DTG using a virus bearing the H51Y substitution in integrase, the emergence of an arginine to a lysine substitution at position 262 (R262K) was observed. We characterized the addition of R262K to H51Y with regard to integrase strand-transfer activity and resistance to DTG in vitro and in tissue culture.

**RESULTS:** Here we show that the addition of R262K to H51Y decreased recombinant integrase strand-transfer activity but improved integrase DNA binding affinity compared to the wild-type or H51Y enzymes. The defect in strand-transfer activity did not translate into a decrease in HIV-1 infectivity. The combination of H51Y and R262K substitutions slightly decreased susceptibility to DTG (FC=1.87) in cell-based resistance assays.

**CONCLUSIONS:** Although viral replication was not affected and enzyme efficiency was impaired by the combination of R262K with H51Y,

we observed an overall increase in the level of drug resistance against DTG. Our findings suggest that arginine at position 262 plays an important role in DNA binding.

## BS26

### CONTROL OF HIV INFECTION BY GENE THERAPY WITH A SECRETED ENTRY INHIBITOR

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Soluble CD4 (sCD4) binds to the HIV envelope proteins and inhibits viral entry. In a small clinical trial, frequent administration of high doses of recombinant sCD4 completely neutralized cell-free HIV. However, continuous injection of purified proteins is not feasible for the long-term treatment of patients. Therefore, we used a lentiviral vector (LV) for the continuous secretion of sCD4 from human cells. sCD4 was secreted from gene-modified producer cells and bound to recombinant gp120 and to cells expressing gp160. Viral entry and gp160-mediated cell fusion were inhibited in the presence of sCD4. Infectivity of HIV produced from gene-modified cells expressing sCD4 was severely reduced.

To optimize sCD4 expression, we evaluated LVs with different promoters in myeloid and lymphoid cell lines. The elongation factor  $\alpha$  (EF1 $\alpha$ ) promoter was active in all tested cell lines, while the cytomegalovirus promoter mediated a low expression in T cells, which was only modestly improved by the addition of a ubiquitous chromatin opening element. To further increase sCD4 secretion, we tested different signal peptides, showing that the human alpha-1 antitrypsin signal peptide fused to sCD4 (AAT-CD4) increased secretion in comparison to the native signal peptide.

The optimized vector with the EF1 $\alpha$  promoter and AAT-CD4 was subsequently used to transduce CD4<sup>+</sup> T cells and CD34<sup>+</sup> hematopoietic stem/progenitor cells (HSPCs). Gene-modified T cells were protected from infection and culture supernatants from HSPCs inhibited viral entry by >90%. Gene-modified HSPCs differentiated into CD4<sup>+</sup>/CD8<sup>+</sup> cells ex vivo, suggesting that sCD4 does not interfere with T cell development. The HSPCs were injected into immunodeficient mice and gave rise to gene-modified progeny cells. The humanized mice will be tested for serum levels of sCD4 and challenged with HIV.

Overall, relevant cell types can produce significant quantities of sCD4 and transplantation of gene-modified T cells or HSPCs has the potential to suppress HIV replication.

## BS27

### HIV INHIBITS LPS-INDUCED IL-27 PRODUCTION VIA HIV TAT THROUGH THE INHIBITION OF TRAF-6, AND CONSEQUENT INHIBITION OF PI3K AND P38 AND JNK MAPKS IN HUMAN MACROPHAGES

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Monocyte-derived macrophages (MDM) from HIV-infected patients and MDM infected in vitro with HIV manifest inhibition of cytokines including IL12. IL27, an IL12 family cytokine, was shown to inhibit HIV replication in macrophages. Whether HIV infection or HIV accessory protein(s) impact IL27 production in macrophages remains unknown. Herein, we show that in vitro HIV infection as well as intracellular HIV and HIV-tat peptides inhibited LPS-induced IL27 production in MDM suggesting that HIV-tat inhibits IL27 production by impairing TLR-4 signalling. To study the mechanism governing HIV-tat-mediated inhibition of LPS-induced IL27 production, we first established that p38 and c-Jun N-terminal kinase (JNK) mitogen-activated protein kinase (MAPK), the phosphoinositide-3-kinase (PI3K), SRC homology region 2 domain-containing tyrosine phosphatase-1 (SHP-1) and Src kinases regulated LPS-induced IL27 production in MDM. HIV-tat caused TNF receptor associated factor (TRAF)-6 inhibition and consequent decreased phosphorylation of downstream PI3K, and p38 and JNK MAPKs implicated in LPS-induced IL27 production. However, SHP-1 and Src kinases were not involved in HIV-Tat-mediated inhibition of LPS-induced IL27 production. In contrast to HIV-tat, in vitro HIV infection of MDM inhibited LPS-induced p38 and JNK activation. Overall, HIV inhibits LPS-induced



IL27 production via HIV tat through the inhibition of TRAF-6, and consequent inhibition of PI3K and p38 and JNK MAPKs in macrophages.

## BS28

### DEVELOPMENT OF A CHIMIGEN® DENDRITIC CELL RECEPTOR-TARGETED MULTI-ANTIGEN HIV VACCINE

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Chimigen® Platform Technology has been used to design a novel dendritic cell (DC) receptor-targeted HIV vaccine that incorporates multiple HIV-1 antigens and is capable of inducing antigen-specific cellular and humoral immune responses for prophylactic and early intervention therapeutic applications.

Chimigen® Vaccines are chimeric recombinant fusion proteins of selected antigen(s) and specific xenotypic (murine) antibody fragments including the Fc region. These chimeric molecules bind to specific receptors on DCs and other antigen presenting cells for antigen uptake. They are processed through both proteasomal and endosomal pathways and presented to T cells through MHC class I and class II molecules, stimulating cellular and humoral immune responses against the chosen antigens.

The Chimigen® HIV Vaccine, containing the HIV-1 Gag, Env, Tat, Rev, Vpr and Vpu antigens, was expressed in Sf9 insect cells and purified. DC-binding experiments and antigen presentation assays *ex vivo* using human peripheral blood mononuclear cell-derived DCs, T cells and B cells demonstrated that the Chimigen® HIV Vaccine binds to immature DCs in a dose-dependent manner, induces CD4+ and CD8+ T cell activation and proliferation, and promoted increased production of IFN- $\gamma$  and TNF- $\alpha$  from both CD4+ and CD8+ T cells. Furthermore, B cells stimulated with vaccine-loaded DCs were found to produce antigen-specific IgM antibodies. Evaluation of Immune responses to the vaccine *in vivo*, in Sprague Dawley rats, confirmed that all antigenic components of the HIV vaccine are immunogenic and induce both HIV-specific cell-mediated and humoral immune responses. Th1 immune responses were predominant, with IFN- $\gamma$  cytokine responses prevalent over IL-4 production in rat splenocytes, and IgG2A serum antibody titres dominant over IgG1 antibodies. This study established safety and “proof of concept” and therefore, shows potential for development as a prophylactic/early intervention therapeutic vaccine against HIV infections.

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## BS30

### DURABLE ANTIBODY RESPONSES AGAINST THE 2F5 REGION OF THE MPER OF HIV GP41 ARE ELICITED USING ENGINEERED DNA AND LIPOSOME VACCINES, AND CO-IMMUNIZATION STRATEGIES

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The membrane proximal region of HIV-1 gp41 (MPER) is well-conserved and the target of several broadly neutralizing Abs. However, antibody (Ab) responses against the MPER are rarely observed in HIV+ individuals, or through vaccine strategies using MPER-based immunogens. Impediments to the design of vaccines targeting the MPER include an incomplete understanding of the MPER structure in the pre-fusogenic spike, the close association of the MPER with the plasma membrane, and restricted/transient exposure of key neutralizing sites. In a previous study, immunization with a MPER-based DNA vaccine encoding a non-native transmembrane domain (TMD), required the use of the adjuvant, flagellin, to elicit marginal Ab responses against the MPER in rabbits; boosting with liposomes bearing MPER peptides moderately increased titres. Serum responses mapped to the 2F5 region of the MPER and affinity-purified Abs neutralized a Tier 2 HIV-1 envelope, but were not durable and of low titre. In assessing alternative vaccine strategies to increase Ab titres, we observed that co-immunization with DNA and liposome/peptide vaccines improved durability of titers against an MPER peptide (to ~12 weeks); but titers remained low. Immunization of guinea pigs with a DNA-prime/

liposome-boost elicited a negligible anti-MPER response, with detectable serum Abs being against flagellin and the hemagglutinin tag encoded by the DNA vaccine. To address the poor exposure of the 4E10 site by our original DNA vaccine, we further engineered our MPER vaccine to support a trimeric helical structure and to better expose key neutralizing sites. Our initial analyses indicate that DNA vaccination required boosting with a liposome/peptide vaccine to elicit moderate responses against a MPER peptide bearing the 2F5 sequence; analysis of the Ab response against the 4E10 site is currently ongoing. Our results suggest that MPER reactivity can be augmented with liposome/peptide boosts, and that the nature of the TMD affects MPER antigenicity and immunogenicity.

## BS31

### PROBING AND CHARACTERIZING RESISTANCE TO INTEGRASE INHIBITORS USING SIVMAC239

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We previously showed that SIVmac239 is susceptible to raltegravir (RAL), elvitegravir (EVG) and dolutegravir (DTG) with IC50s in the nanomolar range, and integrase (IN) mutant SIV displayed similar resistance profiles to HIV. A long-acting form of a new IN strand transfer inhibitor (INSTI) termed S/GSK-1265744, a DTG analogue, was shown to protect macaques against repeated vaginal and rectal exposures of SHIV. These studies show that nonhuman primates can be utilized to investigate the potential role of INSTIs in HIV therapy, pathogenesis and transmission. Our objectives were to observe whether HIV and SIV share similar resistance pathways under INSTI pressure in selections and cell-free assays and to test the effects of HIV-1 IN resistance mutations on SIV IN activity.

Tissue culture selections were performed in rhesus macaque peripheral blood mononuclear cells infected with SIVmac239 in the presence of INSTIs. The SIVmac239 IN gene was cloned into a pET15b vector. Purified recombinant SIVmac239 WT, E92Q, T97A, G118R, Y143R, Q148R, N155H, R263K, E92Q/T97A, E92Q/Y143R, R263K/H51Y and G140S/Q148R IN enzymes were generated and integrase activities and INSTI inhibitory constants were assessed using cell-free assays.

Genotypic analysis of the IN coding region of SIVmac239 in tissue culture selections under EVG pressure yielded the E92Q mutation after 29 weeks, and a mixture including the 263R/K mutation after 21 weeks of DTG pressure. The G118R and G140S/Q148R substitutions diminished target DNA affinity (~5.5 and 2-fold) and enzyme efficiency by 80% and 60%, respectively. G140S/Q148R negatively impacted strand transfer activity (70% of WT levels). RAL and EVG showed reduced activity against the Q148R, E92Q/Y143R and G140S/Q148R variant enzymes. The Q148R and G140S/Q148R enzymes showed moderate resistance to DTG.

This study supports the use of nonhuman primates to study HIV pathogenesis, therapy and transmission. SIVmac239 viruses treated with DTG led to the emergence of a R263R/K mixture, and the detection of the E92Q mutation in SIVmac239 viruses treated with EVG. This study further confirms that the same mutations associated with drug resistance in HIV display similar profiles in SIV.

## BS32

### ANTIRETROVIRAL DRUG TRANSPORTERS AND METABOLIC ENZYMES IN HUMAN TESTICULAR TISSUE – POTENTIAL CONTRIBUTION TO HIV-1 SANCTUARY SITE FORMATION IN THE TESTES

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Previous studies have reported that HIV-1 is capable of persistent infection in the testes, a proposed viral sanctuary site with potentially limited antiretroviral drug (ARV) penetration due to a naturally restrictive environment caused in part by the blood-testis barrier (BTB). This study aims to characterize drug transporters and metabolic enzymes in the human testes to gain insight on ARV disposition in this organ. Testicular tissue samples were obtained from uninfected men (N=8) and HIV-1 infected



men on ARV therapy (plasma viral load < 50 copies/mL, N=5) who underwent elective orchiectomy for gender reassignment surgery. We selected 11 representative drug transporters and two drug metabolic enzymes to study in the testes based on their relevance to ARV disposition. We observed high gene expression of MRP1 and OATP2B1, moderate expression of BCRP, and low expression of P-gp, MRP2, OATP1A2, OATP1B1, OAT1, OCT1, CNT1, ENT2, CYP2D6 and CYP3A4. However, we detected protein expression for all transporters and metabolic enzymes analysed with the exception of OATP1A2 and OCT1. Overall, gene and protein expression levels displayed interindividual variations, but did not differ significantly between the two study groups. Our fluorescence microscopy results also showed that drug transporters and drug metabolic enzymes are not limited to BTB localization at the seminiferous epithelium, but can be found throughout the testicular tissue. Our data are the first to demonstrate protein expression and localization of key drug transporters and metabolic enzymes in the testes of ARV-treated HIV-1 infected men, and suggest the testes are a complex pharmacological compartment that has the potential to regulate the disposition of several ARVs. (Supported by CIHR and OGS)

### BS33

#### AN NOVEL HIV VACCINE TARGETING THE 12 PROTEASE CLEAVAGE SITES: LONGITUDINAL ANALYSIS OF SIVMAC239 MUTATIONS AROUND THE 12 PROTEASE CLEAVAGE SITES AND THEIR CORRELATIONS WITH VIRAL LOAD REDUCTION AND CD4 COUNTS

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**BACKGROUND:** HIV-1 protease mediates the cleavage of Gag, Gag-Pol and Nef precursor polyproteins in a highly specific and temporally regulated manner. Because a total of 12 cleavage reactions are required to generate a mature virion, generating focused immune response targeting the sequences surrounding the protease cleavage sites (PCS) could drive viral mutations to its disadvantage. We have conducted a proof of concept study with Cynomolgus macaques and pathogenic SIVmac239 as a model and used a modified recombinant vesicular stomatitis vector and nanocarriers to deliver 12 20-amino acid antigens. We showed that a vaccine targeting the sequences surrounding the 12 protease cleavage sites is promising at prevention of HIV-1 infection and disease progression. In this study we systematically analyzed breakthrough viruses of vaccinated and control macaques.

**METHODS:** The sequences surrounding the 12 PCS were amplified from plasma RNA of all SIVmac239 positive samples. The amplified PCR products were sequenced with 454 pyrosequencing technology. The amino acid and frame shift mutations were analyzed and correlated with viral load and CD4 counts by regression analysis. Multivariate analysis was conducted to determine amino acid mutations at multiple PCS sites on viral load reduction.

**RESULTS:** Extensive mutations were detected around PCS and both conserved and non-conserved mutations are correlated with lower viral load ( $p < 0.0001$ ). The breakthrough viruses from the vaccinated macaques carry significantly higher mutations than the controls. Longitudinal analysis revealed that the high rate of non-conserved and conserved amino acid mutations along the sequences surrounding the PCS lead to the reduction and diminishing of viral load.

**CONCLUSIONS:** The pathogenic SIVmac239 is extremely vulnerable to any amino acid alternations surrounding PCS and focusing immune response to sequences surrounding the PCS of HIV-1 can drive amino acid mutations and lead to complete viral control.

### BS34

#### HIV RESISTANCE PATHWAYS SUPPORT THE USE OF LAMIVUDINE (3TC) AND DOLUTEGRAVIR (DTG) IN COMBINATION

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Dolutegravir is the only antiretroviral drug that has not led to the emergence of HIV drug resistance mutations in clinical trials with treatment-naïve participants. This is true not only for resistance mutations against dolutegravir itself but also for mutations against other drugs co-administered with it. Previous results suggested that this might be due to a decrease in viral replicative capacity associated with a R263K substitution in integrase that causes low-level resistance against dolutegravir and a diminished ability to generate resistance against reverse transcriptase inhibitors. Given the recent approval of a once-daily single pill regimen combining dolutegravir with lamivudine and abacavir, we investigated the effect of combining the dolutegravir-specific R263K integrase resistance substitution with either M184I or M184V, two reverse transcriptase substitutions that are associated with resistance against lamivudine and emtricitabine and that are frequently detected in individuals failing therapeutic regimens containing either of the latter agents. Our results show that the presence of R263K/M184I/V in a single virus resulted in further decreases in viral replicative capacity compared to the presence of single substitutions alone. This study supports the use of dolutegravir together with lamivudine or emtricitabine in HIV therapy.

#### Basic Sciences: HIV Virology/Pathogenesis, Including Antiviral Mechanisms

#### Sciences fondamentales : Virologie/pathogénie du VIH, mécanismes antiviraux compris

### BS35

#### DNA TARGET SPECIFICITY FOR DEAMINATION BY THE APOBEC3 PROTEINS INFLUENCES THEIR POTENCY FOR HIV-1 GENE INACTIVATION

Belanger, Kasandra; Langlois, Marc-André  
 Ottawa, ON

APOBEC3 (A3) proteins are host intrinsic restriction factors that hinder retroviral replication and spread. The most potent members of the human A3 family against HIV-1 include APOBEC3D (A3D), APOBEC3F (A3F), APOBEC3G (A3G) and APOBEC3H (A3H). These enzymes mutate cytosines into uracils in the minus-strand viral cDNA during reverse transcription. Deamination by the A3 proteins occurs in a specific DNA context; A3G prefers to mutate 5'CC substrates whereas all other A3 target 5'TC motifs. Intense mutation of proviral DNA causes premature stop codons and protein malfunction resulting in the abortion of a productive infection. However, the viral infectivity factor (Vif) expressed by HIV gradually induces the degradation of A3 proteins as it accumulates over the course of the infection, thereby allowing for the generation of negligible amounts of mutations as A3 protein levels drop. This sublethal mutagenesis is believed to be beneficial for the virus through genetic diversification and emergence of more fit or drug-resistant variants. Here, since the generation of termination codons occurs by deamination opposite to TGG tryptophan (Trp) codons, we investigated how target site specificity of A3 proteins influences their gene inactivation potency. We found that A3G is extremely potent at introducing termination codons independently of the intensity of deamination as long as Trp codons are present in a gene. In contrast, A3F's ability to inactivate gene function is highly dependent on the intensity of mutation rather than the generation of stop codons. In summary, our results support that the sublethal mutational burden produced by A3F, and presumably also by A3D and A3H, is likely to result in HIV-1 genetic diversification that is overall more beneficial for the virus than detrimental.

### BS36

#### HARMINE AND SUDEMYCIN C1 INHIBIT HIV-1 GENE EXPRESSION AND REPLICATION THROUGH MODULATION OF HIV-1 MRNA LEVELS

**Chen, Alex; Cabral, Tyler; Wijewardena, Chathura; Cochrane, Alan Toronto, ON**

Previous studies have demonstrated that HIV-1 RNA processing can be altered to suppress virus replication by modulating the activity/abundance of the SR or hnRNP proteins of the host cell. Harmine has been shown to inhibit DYRK1a, a host kinase known to regulate RNA splicing. On the other hand, sudemycin c1 has been shown to inhibit SF3b, a host splicing factor. We observed that harmine and sudemycin c1 were potent inhibitors of HIV-1 gene expression, reducing levels of all viral proteins (Gag, Env, Tat) evaluated. In addition, both harmine and sudemycin c1 reduced the overall HIV-1 mRNA species at 3uM in vitro. Consistent with this response, harmine also reduced accumulation of all classes of HIV-1 RNAs and blocked export of viral genomic RNA to the cytoplasm. Finally, both harmine and sudemycin c1 inhibited HIV-1 replication in PBMCs, raising the prospect that this approach could offer an alternative to existing treatments for this infection.

Interestingly, parallel experiments evaluating the effect of DYRK1a depletion revealed that reduction of DYRK1a levels by >90% had little to no effect on HIV-1 gene expression nor did it alter the ability of harmine to repress viral protein synthesis.

Although harmine is also an inhibitor of monoamine oxidase, another inhibitor of this enzyme (moclobemide) failed to elicit a similar suppression of HIV-1 gene expression. Together, the data suggest that the action of harmine on HIV-1 replication is mediated by an unknown host factor and current efforts are directed at defining the host factor(s) mediating its effect. Finally, this study highlights modulating host mRNA splicing machinery as a previously under-appreciated strategy to suppress HIV-1 replication.

### BS37

#### VIRAL BIMOLECULAR FLUORESCENCE COMPLEMENTATION: A NOVEL TOOL TO STUDY INTRACELLULAR VESICULAR TRAFFICKING PATHWAYS

**Dirk, Brennan S; Jacob, Rajesh A; Johnson, Aaron L; Cavanagh, Peter C; Pawlak, Emily N; Van Nynatten, Logan; Dikeakos, Jimmy D London, ON**

Human Immunodeficiency Virus (HIV-1) produces the viral accessory protein Nef, and hijacks a variety of the membrane trafficking regulators to facilitate immune evasion. Specifically, the subversion of the phosphofurin acidic sorting cluster protein – 1 (PACS-1) has been demonstrated to be critical for the downregulation of cell surface Major Histocompatibility Complex class I (MHC-I) levels. Past research has largely focused on biochemical assays to dissect the role of Nef in MHC-I down regulation, rather than visualizing interactions within cells. In this report we describe a novel vector system which allows for the simultaneous expression of Nef and host cellular proteins from a single lentiviral vector. Insertion of an F2a cleavage site from the foot and mouth disease virus, enabled concurrent expression of MHC-I or PACS-1 in addition to Nef. Furthermore, our lentiviral vector system allowed the efficient visualization of the PACS-1/Nef interaction in the endolysosomal network through bimolecular fluorescence complementation, a method used to visualize protein interactions in cells. Altogether, our vector system represents a new and novel way of studying Nef and its multiple functions at the cellular level.

### BS38

#### ANTI-APOPTOSIS AGENT PRESERVES CD4 T CELLS AND PREVENTS DISEASE PROGRESSION IN SIV-INFECTED RHESUS MACAQUES

**Laforge, Mireille<sup>1</sup>; Silvestre, Ricardo<sup>1</sup>; Rodrigues, Vasco<sup>1,2</sup>; Campillo-Guimenez, Laure<sup>1</sup>; Mouhamad, Shahul<sup>1</sup>; Senik, Anna<sup>1</sup>; Silvestri, Guido<sup>3</sup>; Senik, Anna<sup>1</sup>; Estaquier, Jerome<sup>1,4</sup>**

<sup>1</sup>Paris, France; <sup>2</sup>Porto, Portugal; <sup>3</sup>Atlanta, GA, USA; <sup>4</sup>Quebec, QC  
Apoptosis has been proposed as one of the main mechanisms responsible for the CD4 T-cell depletion observed during HIV infection and AIDS. We identified a new compound as an inhibitor of spontaneous and acti-

vation-induced cell death of T cells from SIV-infected rhesus macaques (RMs). When injected in SIV-infected RMs during the acute phase of infection, this compound reduced the levels of T cell apoptosis and preserved memory CD4 T cells. This treatment reduced the levels of the inflammatory markers IL-18, CD95L, and sCD14. Although this treatment was limited to the acute phase, the levels of viral replication and SIV DNA remained low during the chronic phase. Most importantly, we prevented the development of AIDS.

*This work was supported by ANRS to JE. JE thanks the Canada Research Chair program for financial assistance.*

### BS39

#### RNA INTERFERENCE REMAINS FUNCTIONAL DURING HIV-1 REPLICATION DESPITE TAR AND RRE RNAs ACTING AS RNA SILENCING SUPPRESSORS

**Daniels, Sylvanne M<sup>1</sup>; Sinck, Lucile<sup>1</sup>; Melendez-Peña, Carlos E<sup>1</sup>; Scarborough, Robert J<sup>1</sup>; Azar, Ibrahim<sup>1</sup>; Rance, Elodie<sup>1</sup>; Daher, Aïcha<sup>1</sup>; Pang, Ka M<sup>2</sup>; Rossi, John J<sup>2</sup>; Gatignol, Anne<sup>1</sup>**

<sup>1</sup>Montréal, QC; <sup>2</sup>Duarte, CA, USA

**BACKGROUND:** Viruses co-opt and disturb numerous cellular functions upon their entry into cells. RNA interference (RNAi) is a natural mechanism used by eukaryotes for regulating gene expression. This process is dependent upon 20-25-nt exogenous small interfering (si)RNAs or endogenous micro (mi)RNAs, which target mRNAs. siRNAs and miRNAs are incorporated into a complex called the RNA-induced Silencing Complex (RISC). In mammals, the minimal RISC is composed of the RNase Dicer, the TAR RNA binding protein (TRBP), an Argonaute protein and a si or miRNA. The RNAi pathway may restrict virus replication by targeting RNA and viruses have evolved with RNA silencing suppressors (RSS). The HIV Tat protein and the TAR RNA have been described as RSSs, but their activity has been questioned. We tested the RRE RNA for its RSS activity and evaluated its mechanism. We also evaluated if HIV-1 or a lentiviral vector harbouring TAR and RRE could act as RSSs. **RESULTS:** We used a cellular reporter gene (RL or EGFP) assay based on miRNA Let7 activity to measure RNAi activity or its suppression. We observed that RRE and TAR, but not Tat, act as RSSs with no modification of the endogenous RISC. Using RNA-immunoprecipitation and gel mobility shift assays, we found that TAR and RRE RNAs displace siRNAs from TRBP. A lentiviral vector expressing TAR and RRE, also suppressed RNAi, but this function was abolished when Rev or GagPol were coexpressed. Because RNAi remained functional in cells replicating HIV-1, we concluded that TAR and RRE RSS activity is largely masked when viral proteins are expressed.

**CONCLUSION:** TAR and RRE compete with siRNAs and miRNAs for binding to TRBP, but HIV proteins mask this RSS function. A functional RNAi activity during viral replication validates the use of siRNAs or short hairpin RNAs against HIV as gene or drug therapy.

### BS40

#### IMPLEMENTATION OF AN IN-HOUSE QUANTITATIVE REAL-TIME PCR FOR DETERMINATION OF HIV VIRAL LOAD IN KINSHASA

**Kamangu, Erick N**

**Kinshasa, Democratic Republic of the Congo (Kinshasa)**

**BACKGROUND:** Measurement of Viral Load (VL) is the most reliable mean for evaluating virological monitoring of the Human Immunodeficiency Virus (HIV) infection. It allows determination of the amount of virus present in a given volume. Due to the constraints of costs, the VL is not often requested for patient's follow-up in countries with limited resources. Hence the objective of this study is to implement an in-house Quantitative Real-Time PCR to assess the VL of HIV infected patients in Kinshasa.

**METHODS:** One hundred and fifty five patients positive for HIV type 1, naive of Antiretroviral Therapy (ART) and eligible for treatment were included in the study. Five milliliter of blood was collected in a tube with anticoagulant. One milliliter of plasma was sent to the laboratory for analysis. After RNA extraction, a Quantitative Real time PCR was performed on a portion of the region of the Long Terminal Repeat (LTR) of the virus.

**RESULTS:** Of 155 samples received for determination of VL by Quantitative Real-Time PCR, 153 were successfully amplified according to the protocol. The median VL was 301,052.97 copies/mL or 5.48 log<sub>10</sub>.

**CONCLUSIONS:** The results of VL were used to assess the feasibility of the Real-Time Quantitative PCR. It turns a simple, reliable and less expensive alternative for the diagnosis and virological monitoring of HIV patients under ART.

#### **BS41**

##### **VIRAL CHARACTERISTIC OF PATIENTS INFECTED WITH HIV AT THE START OF ANTIRETROVIRAL THERAPY IN KINSHASA**

**Kamangu, Erick N**

**Kinshasa, Democratic Republic of the Congo (Kinshasa)**

**BACKGROUND:** Viral Load (VL), CD4 T cells count and clinical signs are significant parameters for the AntiRetroViral Treatment decision (ART). The objective of this work is to determine the profile of the Viral Load of eligible patients on treatment in the centers according to the algorithm used in Kinshasa and the DRC.

**METHODOLOGY:** Our sample consisted of 153 HIV-positive patients naïve to ART. All patients aged over 18 years were included in the study without gender discrimination. The determination of the VL was done at the laboratory of Molecular Biology of the Faculty of Medicine of the University of Kinshasa using a previously described PCR assays.

**RESULTS:** Of the 153 patients included in the study, 92 (60.1%) were women. The age of the patients was in the range 18 to 65 years with a mean of 37 years. Most patients (91.5%) were in clinical stage 3, while the rest (8.5%) in clinical stage 4 for HIV infection. The rate of CD4 + T lymphocytes was between 8 and 915 cells/mm<sup>3</sup> with a median value of 180 cells/mm<sup>3</sup>. Seventy nine patients (86.8%) had CD4 count under 500 cells/mm<sup>3</sup>. The median VL of patients included is 5.68 log<sub>10</sub> RNA copies/mL. The minimum and maximum values are respectively 0.37 log<sub>10</sub> and 7.95 log<sub>10</sub> RNA copies/mL.

**CONCLUSION:** The majority of treatment-eligible patients (63.4%) in Kinshasa begin Antiretroviral Treatment with a poor prognosis. The Viral Loads are usually very high in these patients and CD4 collapsed.

#### **BS42**

##### **EXTRACELLULAR HISTONES: IDENTIFYING A NEW HOST FACTOR TO REGULATE HIV-1 INFECTION**

**Kozlowski, Hannah N; Lai, Eric; McCarthy, Stephen D; Branch, Donald R**  
**Toronto, ON**

**BACKGROUND:** It has been shown that neutrophil extracellular traps (NETs) can capture HIV-1 virions (Cell Host Microbe, 2012). Notably, it has also been determined that these NETs contain extracellular histones, which also help kill bacteria (Science, 2004). Previously, we identified histones, found in the plasma of the saltwater crocodile (*Crocodylus porosus*), as possible inhibitors of HIV-1 infection. We have now established the efficacy of histones as novel inhibitors for HIV-1 infection.

**METHODS:** Infections were conducted using HIV-1<sub>IIIB</sub> (X4) and p24 as readout and/or recombinant viruses, HXB2 (X4) or JR-FL (R5) and luciferase readout. Human histones H1, H2A, H2B, H3 and H4, or crocodile H2B, were tested for ability to inhibit HIV-1 infection.

**RESULTS:** Results using human recombinant histones H2B, H3 and H4 were equivocal as consistent inhibition was not obtainable. However, human recombinant histones H1 and H2A were able to inhibit R5 infection by 59% and 60% respectively. Using recombinant crocodile-derived H2B, we could significantly inhibit both X4 and R5 HIV-1, by 73% and 91% respectively. The IC<sub>50</sub> for R5 HIV-1 inhibition using recombinant crocodile histone H2B was 0.767 µg/mL.

**CONCLUSIONS:** We conclude that extracellular histones found in crocodile blood are significant inhibitors of HIV-1 infection in vitro. Differences between protein sequences of human and crocodile histones appear to affect efficacy for HIV-1 inhibition. Future studies, in vitro and in vivo using a humanized mouse model for HIV-1 infection, with crocodile H2B and with peptides derived from the crocodile H2B, as well as human histones, are planned to further evaluate the significance of extracellular histones in regulating HIV-1 viral infection. Finally, the release of extra-

cellular histones through NETs may represent a novel resistance mechanism to HIV-1 infection.

#### **BS43**

##### **RESISTANCE OF TRANSMITTED FUNDER HIV-1 TO MXB RESTRICTION**

**Liu, Zhenlong; Pan, Qinghua; Wang, Zhen; Liang, Chen**  
**Montreal, QC**

Host restriction factors constitute an important domain of innate immunity. Some of the well-studied examples include APOBEC3G, TRIM5α, tetherin, IFITM and SAMHD1. A recent addition is the human myxovirus-resistant protein B (MxB, also called Mx2) that strongly inhibits HIV-1 infection. Results from several groups demonstrate that MxB impedes the nuclear import of HIV-1 DNA by interacting with viral core complex and likely delaying viral uncoating. In support of this mechanism of action, multiple mutations in HIV-1 capsid have been reported to resist MxB inhibition. It is noteworthy that these MxB-resistant capsid mutations reduce HIV-1 infectivity and thus are not found in HIV-1 isolates from the infected patients. In order to determine whether HIV-1 has naturally evolved to evade MxB restriction, we tested a group of transmitted funder (T/F) HIV-1 strains for their sensitivity to MxB. Two T/F strains were found refractory to MxB inhibition and this resistant phenotype was further mapped to two amino acid positions Q87 and A208 in viral capsid. The Q87 variant is located in the cyclophilin A (CypA) binding loop and has a prevalence of 21% in HIV-1 sequences registered in HIV database (<http://www.hiv.lanl.gov/content/index>). The A208 residue is located to the C-terminal domain of capsid and is represented in 35% of HIV-1 sequences. Our results demonstrate the existence of MxB-resistant T/F HIV-1 strains. The high prevalence of MxB-resistant capsid mutations in the circulating HIV-1 strains indicates the significant selective pressure of MxB on HIV-1 replication in vivo.

#### **BS44**

##### **ANALYSIS OF THE AUTOPHAGY-INDUCING CAPACITY OF THE HIV-1 ANTISENSE PROTEIN (ASP)**

**Liu, Zhenlong; Torresilla, Cythia; Xiao, Yong; Caté, Clément; Barbeau, Benoît**  
**Montreal, QC**

The existence of antisense transcription in HIV-1 has been suggested over the years and readdressed in several recent reports. Furthermore, this transcript has been proposed to encode a protein termed Antisense Protein (ASP). Using a codon-optimized ASP expression vector, we have previously detected ASP in various mammalian cell lines by Western blot (WB), flow cytometry and confocal microscopy analyses. Our results have further demonstrated that this protein forms multimers, is unstable and is capable of inducing autophagy, which likely accounts for difficulties in its detection in infected cells. The aim of the study was to further examine the pathway leading to induction of autophagy by ASP.

We first performed confocal microscopy analyses to search for potential co-localization between ASP and all Autophagy-related Genes (ATG). COS-7 and HeLa cells were transfected with an ASP expression vector and tested for its distribution with respect to p62 (SQSTM1) or LC3B, two well-known autophagy markers. Our analyses clearly demonstrated that these proteins co-localized with ASP in various cellular structures, some of which were autophagosome-like. Furthermore, co-Immunoprecipitation experiments confirmed the interaction between LC3B and ASP in COS-7 cells. We next analyzed various ASP deletion mutants by confocal microscopy and Western blot in COS-7 cells, and found that the proline-rich domain was needed for ASP multimerization, its cellular distribution, and induced autophagy. We have also initiated a series of experiments with ASP genes from various HIV-1 clades. Our preliminary results show that HIV-1 clade A ASP which lacks the first 25 amino acids, is more stable and presents a distinctive cellular distribution, when compared to other HIV-1 clades. We are currently assessing the capacity of the various clade-specific ASP to induce autophagy.

Overall, our results demonstrate that ASP-induced autophagy might be associated with various ATG proteins and that the extent of autophagy induction might be clade-dependent.



**BS45****REGULATION OF HIV-1 MRNA PROCESSING BY THE HOST SR PROTEIN FACTORS****Ming, Liang; Cochrane, Alan**  
**Toronto, ON**

Splicing of HIV-1 viral transcript is highly controlled, and plays a crucial role in HIV-1 replication and gene expression. For generation of all mRNAs required, HIV-1 utilizes alternative splicing to produce three classes of viral RNAs (unspliced, singly spliced and multiply spliced RNA), totally over 40 mRNAs, from one single 9 kb pre-mRNA transcript. Manipulating this alternative splicing process will alter HIV-1 RNA splicing and further affect viral protein synthesis, resulting in the failure of infectious virion assembly. Given HIV-1 resistance to the standard highly active anti-retroviral therapies (HAART), we have shown that targeting viral RNA processing is a viable approach for HIV treatment.

HIV-1 mRNA processing requires the combinatory usage of four 5' splice sites and eight suboptimal 3' splice sites. Host splicing factor SR proteins were reported to be involved in the use of 3' splice sites to regulate HIV RNA splicing. To identify host factors crucial for this process, the knock-down of various SR proteins was performed, and the effects on HIV-1 protein expression and viral RNA processing were examined. The knock-down of SRp20 showed the most significant effect in the expression of viral structural proteins Gag and Env. The reduction of SRp20 level led to significant increase of unspliced viral RNA accumulation. On the other hand, the expression of viral regulatory protein Tat was attenuated. Subsequent analysis also revealed that the depletion of SRp20 resulted in alteration of splicing site usage of tat mRNAs in both MS and SS viral RNAs. Together, these studies suggest SRp20 to be a key host regulator of HIV-1 RNA processing and replication, and might be used as the target to control HIV-1 infection.

**BS46****EXPLORING THE ROLE OF MEMBRANE TRAFFICKING REGULATOR SORTING NEXIN PROTEINS IN HIV-1 NEF MHC-I DOWNREGULATION****Pawlak, Emily N; Dikeakos, Jimmy D**  
**London, ON**

In spite of the enormous effort to combat the human immunodeficiency virus type 1 (HIV-1), it remains largely unknown how this deadly pathogen thrives in the face of the host antiviral response. In contrast to many pathogenic viruses, HIV-1 relies mostly on a single gene product, Nef, to evade the immune response. The Nef protein mediates immune evasion in part by binding to host cellular proteins, including the membrane trafficking machinery, to induce endocytosis of the cell surface receptor major histocompatibility complex class I (MHC-I). MHC-I downregulation by Nef results in decreased cytotoxic T lymphocyte mediated killing of HIV-1 infected cells. However, the pathway utilized by Nef to mediate MHC-I endocytosis has yet to be fully elucidated. We hypothesized that this pathway utilizes membrane trafficking regulator proteins within the sorting nexin family. Using recombinant proteins, we demonstrate a novel interaction between the sorting nexin 18 (SNX18) protein and HIV-1 Nef. Furthermore, the Nef-SNX18 interaction is dependent on the SH3 domain of SNX18 and a polyproline motif on Nef. Ultimately, we propose that a Nef-SNX18 interaction plays a role in Nef-mediated MHC-I downregulation. The identification of novel protein interactions necessary for Nef-mediated immune evasion may contribute to the development of HIV-1 therapeutics targeting the activities of Nef.

**BS47****N-LINKED GLYCOSYLATION PROTECTS RETROVIRUSES FROM MUTAGENESIS BY HUMAN AND MOUSE APOBEC3 PROTEINS****Renner, Tyler M; Bélanger, Kasandra; Lam, Cindy; Aydin, Halil; Langlois, Marc-André; Gerpe, Maria Carla Rosales**  
**Ottawa, ON**

APOBEC3 proteins are host intrinsic restriction factors that have a key role in protecting humans and other mammals against retroviruses, most notably HIV. These enzymes interfere with their replication and intensely mutate their DNA, thereby inactivating viral progeny and the spread of

infection. Here we describe a new way that some retroviruses have evolved to defend themselves against the mutator activity of APOBEC3 proteins. We show that gammaretroviruses expressing an accessory protein called glyco-Gag, or gPr80, use the host's posttranslational machinery, and more specifically N-linked glycosylation, as a way to regulate their sensitivity to APOBEC3 induced mutagenesis. By carefully governing the intensity of mutations caused by APOBEC3 proteins, gammaretroviruses can turn an otherwise restricting mutator activity to their advantage to help them evolve and persist. This new mechanism could potentially be exploited as a novel way to inhibit APOBEC3 protein activity in humans infected with HIV, which has been linked to immune viral escape and drug resistance.

**BS48****PROBING THE ROLE OF HOST HETEROGENEOUS NUCLEAR RIBONUCLEOPROTEINS IN REGULATING HIV-1 MRNA PROCESSING****Rosenfeld, Paul; Shen, David; Moffat, Jason; Yin, Wen Chi; Cochrane, Alan**  
**Toronto, ON**

With the increase of resistant HIV-1 strains worldwide the need for new drug targets has become increasingly urgent. One such focus is viral mRNA processing, where a delicate balance of host factors is required to regulate the generation of over 40 HIV-1 mRNAs required for complete viral protein expression. Host nuclear ribonucleoproteins (hnRNPs) are complexes of protein involved in post-transcriptional metabolism of RNAs to ensure optimal processing before export to the cytoplasm. Since disruption of HIV-1 RNA processing inhibits efficient replication, the effect of hnRNP knockdown on viral protein expression was examined. In this study, lentiviral vectors containing short hairpin RNAs (shRNAs) targeting several hnRNP mRNAs were used in the context of a doxycycline-inducible HIV-1 provirus. Depletion of hnRNPs C, L, and M mRNA had negligible effect on HIV-1 mRNA and protein expression by qRT-PCR and western blot. In contrast, knockdown of hnRNP G mRNA resulted in a decrease of HIV-1 unspliced (US), singly-spliced (SS) and multiply-spliced (MS) RNAs (corresponding to Gag, p14 Tat and p16 Tat respectively). These results correlated with a decrease in Gag protein levels and an increase of p14 or p16 Tat. Depletion of hnRNP U resulted in an increase of all three HIV-1 RNAs, particularly MS, with only a 52% decrease p14 Tat and an overall increase of Gag and p16 Tat. Analysis of specific splice site usage is still ongoing, but the data emphasizes the influence of specific hnRNPs on HIV-1 RNA processing and their potential as new therapeutic targets.

**BS49****HUMAN CD4+ T CELLS, MONOCYTES, AND MONOCYTE DERIVED MACROPHAGES ARE RESISTANT TO INFECTION BY MG1 AND VSV-Δ51****Sandstrom, Teslin S; Côté, Sandra C; Ranganath, Nischal; Angel, Jonathan B**  
**Ottawa, ON**

**INTRODUCTION:** Complete viral clearance in HIV-infected patients is significantly impeded by the formation of latent HIV reservoirs, which are unresponsive to current therapies. Oncolytic viruses (OVs) are currently being investigated as a novel approach to eliminating the HIV reservoir. However, for this to be a viable treatment option it is imperative that healthy cells are spared from cytopathic effects. Two OVs, Maraba (MG1) and Vesicular Stomatitis Virus (VSV-Δ51), have been designed to preferentially infect cancer cells lacking a robust Type I IFN response. Similar impairment of Type I IFN-mediated antiviral proteins has been described during HIV infection. Thus, we hypothesize that MG1 and VSV-Δ51 will spare healthy cells, while specifically infecting and killing HIV-infected cells.

**METHODS:** Human CD4+ T cells and monocytes were isolated from healthy donors' blood. CD4+ T cells (unstimulated or PHA/IL-2 stimulated), monocytes, and MDMs were infected with increasing MOIs of GFP-expressing MG1 or VSV-Δ51. At various time points, GFP expression and PI staining were measured by flow cytometry to quantify productive infection and cell viability, respectively. The ability of resting CD4+ T cells to express specific IFN-stimulated genes involved in viral clear-

ance was also investigated. Cells were treated with IFN- $\alpha$  and expression of PKR was assessed by immunoblotting.

**RESULTS:** Primary monocytes, MDMs, and unstimulated CD4<sup>+</sup> T cells were relatively resistant to OV infection and killing. However, PHA/IL-2 treated CD4<sup>+</sup> T cells exhibited increased GFP expression in a dose dependent manner. Preliminary results demonstrate a loss in viability during VSV- $\Delta$ 51, but not MG1 infection. Increased PKR expression following IFN- $\alpha$  treatment in both resting and PHA/IL-2 stimulated CD4<sup>+</sup> T cells demonstrated a robust response to exogenous Type I IFN.

**CONCLUSION:** These results suggest that healthy immune cells are resistant to OV infection and cytopathic effects. Future experiments will investigate both specificity of OV infection and expression of Type I IFN-mediated antiviral proteins during HIV infection. This may lend feasibility to the eradication of the latent HIV reservoir by MG1 or VSV- $\Delta$ 51 treatment.

## BS50

### IL-7 INDUCES MEDIATORS OF CELL SURVIVAL AND PROLIFERATION IN TH17 CELLS

Stilla, Alana M; Côté, Sandra C; Angel, Jonathan B  
Ottawa, ON

**BACKGROUND:** In the gut-associated lymphatic tissues, Th17 cells maintain homeostasis and initiate inflammatory responses against pathogenic microbes. During HIV infection, Th17 cells become depleted for unknown reasons and do not become fully restored following HAART. IL-7 is a cytokine that promotes T cell survival and Th17 cell development. Although impaired IL-7 responses have been reported in HIV-infected CD4<sup>+</sup> T cells, the effects of HIV on IL-7 responses in Th17 cells have yet to be investigated.

**HYPOTHESIS:** HIV inhibits Th17 cell survival by dysregulating IL-7 signalling.

**METHODS:** CD4<sup>+</sup>CXCR3-CCR6<sup>+</sup> memory T cells (436 cells), which represent a Th17-enriched population, were isolated from PBMCs from uninfected donors. To characterize IL-7 receptor expression on Th17 cells, 436 cells were stimulated with PMA/ionomycin and treated with Brefeldin A to induce expression of intracellular IL-17A, the main effector cytokine secreted by Th17 cells. Cells were stained for CD127, the unique IL-7 receptor  $\alpha$  component, and IL-17A. To characterize IL-7 responses in Th17-enriched cells, 436 cells were stimulated with IL-7 and stained for phospho-STAT5 and the anti-apoptotic protein Bcl-2. Cell proliferation was measured by CFSE dilution assay.

**RESULTS:** CD127 was expressed on 50% of total 436 cells and 50% IL-17A<sup>+</sup> 436 cells (Th17 cells). Less than 5% of the 436 cells expressed phospho-STAT5 under basal conditions, which increased to 80% following stimulation with IL-7 (0.1ng/mL). Roughly 15% unstimulated 436 cells expressed Bcl-2, while IL-7 (5ng/mL) stimulation increased the frequency of Bcl-2-expressing cells to 50%. Lastly, fewer than 5% 436 cells proliferated when cultured with media alone, whereas IL-7 (10 ng/mL) induced proliferation in 80% of the cells.

**CONCLUSIONS:** Th17-enriched cells are responsive to IL-7, suggesting an important role for IL-7 in promoting Th17 cell survival. Studying the effects of HIV on IL-7 signalling in 436 cells may provide insight into the mechanisms of Th17 cell depletion during infection.

## BS51

### PATHOGENICITY OF CD16+ MONOCYTE-DERIVED DENDRITIC CELLS DURING HIV-1 INFECTION

Tep, Tévy-Suzy; Wacleche, Vanessa Sue; El-Far, Mohamed;  
Chouikh, Younes; Gosselin, Annie; Jenabian, Mohammad-Ali;  
Routy, Jean-Pierre; Ancuta, Petronela  
Montréal, QC

**INTRODUCTION:** During HIV infection, CD16<sup>+</sup> monocytes representing a source of pro-inflammatory cytokines, are highly expanded (up to 50% in AIDS patients), and their frequency is not normalized under ART. Monocytes are precursors for dendritic cells (DC). Functional characteristics of CD16<sup>+</sup> versus CD16<sup>-</sup> monocyte-derived DC (MDDC) during HIV infection remain unknown. To explore the contribution of these MDDC subsets to HIV pathogenesis, we investigated their trans-infection ability and immunogenic potential in relationship with their transcriptome and autophagy markers.

**METHODOLOGY:** Monocytes were isolated from PBMC of healthy donors by negative selection using magnetic beads (Miltenyi). CD16<sup>+</sup> and CD16<sup>-</sup> monocytes were sorted by flow cytometry (BD-AriaII). MDDCs were obtained upon monocyte culture in presence of GM-CSF/IL-4. The trans-infection ability (intracellular HIV-p24, HIV-p24 ELISA, HIV-DNA PCR) and immunogenic potential (CFSE dilution assay) were evaluated by co-culture of MDDC with autologous CD4<sup>+</sup> T-cells in the presence or absence of HIV (NL4.3BaL) and antigens (SEB, CMV, C. albicans, S aureus) or CD3/CD28 Abs. MDDC were pretreated with the autophagy activator rapamycin or inhibitors bafilomycin and 3-MA. Genome-wide transcriptional analysis (Affymetrix) and quantification (western blotting) of autophagy markers were performed in MDDC subsets.

**RESULTS:** CD16<sup>+</sup> versus CD16<sup>-</sup> MDDC exhibit a superior ability to trans-infect CD4<sup>+</sup> T-cells and a reduced ability to induce the antigen-specific proliferation of CD4<sup>+</sup> T-cells and their subsequent production of Th17 cytokines. Rapamycin decreased the HIV trans-infection ability of total MDDC, while bafilomycin and 3-MA did not significantly affect this process. A molecular signature associated with pathogenicity on CD16<sup>+</sup> MDDC was identified, together with alterations in the autophagy process.

**CONCLUSION:** These results emphasize the critical role played by CD16<sup>+</sup> MDDC in HIV pathogenesis and suggest that autophagy alterations are linked to pathogenicity. New therapeutic strategies aimed at restoring autophagy in CD16<sup>+</sup> MDDC may improve their immunogenic potential while limiting viral dissemination in HIV-infected subjects.

## BS52

### HIV-1 GROUP M SUBTYPES DISPLAY DIFFERENTIAL RATES OF CD4 T-CELL DECLINE

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**BACKGROUND:** HIV-1, the etiological agent of the AIDS epidemic, can be categorized into evolutionarily distinct clades. The most prevalent of these clades is Group M (Main) which can be further subdivided into 9 subtypes: A-D, F-H, J and K. The predominant viral subtypes of the epidemic in Sub-Saharan Africa are A, D and C, with subtype C making up more than 50% of infections alone. Unfortunately, despite their importance in global health, these subtypes are studied far less frequently relative to subtype B, the predominant viral subtype in North America and Europe. This study sought to compare rates of pathogenesis between these understudied subtypes in a natural history cohort.

**METHODS:** A cohort of HIV positive Zimbabwean and Ugandan women with known dates of infection had their CD4<sup>+</sup> memory T-cell and viral loads monitored every three months post-infection. Subtype was determined via PCR of the viral envelope. All analyses were done using Generalized Estimating Equations (GEEs, n=302) and Generalized Linear Models (GLMs, n=68).

**RESULTS:** These data showed distinct patterns of T-cell subset decline between HIV subtypes. Infection with a subtype C virus shows a significantly slower rate of cell decline in both total CD4<sup>+</sup> cells as well as in CD4<sup>+</sup> memory subsets compared to subtypes A and D (p<0.01 and p<0.003 respectively). Additionally, subtype C infections demonstrate a significantly longer time to viral load set point with no difference in total viral load at set point relative to subtypes A and D (p=0.009 and p<0.001 respectively). Finally, acute early viruses (within 3 months of infection) were isolated from this cohort and their viral envelopes were cloned into a reporter virus for ongoing work on infection in human primary PBMCs. **CONCLUSIONS:** Disease stemming from infection by an HIV subtype C virus progresses at a diminished rate compared to subtypes A and D.

## BS53

### REPOSITIONING CARDIAC GLYCOSIDES AS A NEW CLASS OF ANTI-HIV-1 DRUGS THAT DISRUPT HIV-1 RNA PROCESSING BY NON-CANONICAL MECHANISMS

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HIV-1 resistance to current antiretroviral therapies requires the development of innovative strategies to control this infection. We aimed at developing novel inhibitors of HIV-1 replication that target viral RNA processing, a stage dependent on host splicing. We recently reported that

the cardiac glycoside (CG) digoxin, a drug treating heart failure, is a potent inhibitor of this stage. CGs are known to bind the Na<sup>+</sup>/K<sup>+</sup>-ATPase and increase intracellular Ca<sup>2+</sup> concentration ([Ca<sup>2+</sup>]<sub>i</sub>), leading to undesired toxicities and cardiac arrhythmias. However, since CGs were discovered to induce multiple signaling pathways, we hypothesized that CGs may alter HIV-1 RNA processing independent of [Ca<sup>2+</sup>]<sub>i</sub> changes. We identified that members of the cardenolide and bufadienolide classes block HIV-1 (Gag) gene expression (GE) without cytotoxicity compared to control. Suppression of HIV-1 GE occurred even if [Ca<sup>2+</sup>]<sub>i</sub> influx via the reverse mode of the Na<sup>+</sup>/Ca<sup>2+</sup>-exchanger—responsible for triggering arrhythmias—is blocked by KB-R7943. Digitoxin, digitoxigenin, and RDK-34 potentially inhibited viral replication of HIV clinical isolates like digoxin (IC<sub>50</sub>: 1 nM) at concentrations below those treating heart conditions (digitoxin: 26-46 nM). Similar to digoxin, all CGs dramatically suppress late phase expression of HIV-1 structural proteins (Gag/Env) and p14-Tat with marginal effects on the early phase factor p16-Tat. However, digoxin-like CGs (digoxin/digoxigenin/lanatoside-C/RDK-34) drastically deplete Rev while other CGs (digitoxin/digitoxigenin/ouabain) had low/no effect on this factor. All CGs induce oversplicing of HIV-1 RNAs, reducing unspliced and singly spliced mRNAs encoding Gag and Env/p14-Tat, respectively. Like digoxin, changes in viral RNA levels were associated with hyperphosphorylation of SRp20 and modification of Tra2 $\beta$ , whereas digitoxigenin causes de-modification of these splicing factors. Moreover, digoxin/digitoxin/ouabain but not digitoxigenin inhibited HIV-1 GE through activation of MEK1/2 in a manner independent of canonical/arrhythmogenic mechanisms. Although all CGs supposedly modulate [Ca<sup>2+</sup>]<sub>i</sub>, this study suggests that modulation of the Src-EGFR-Ras-Raf-MEK1/2-ERK1/2 pathway could be used to control HIV-1 infection.

## BS54

### SCD127 RELEASE DEPENDS ON MMP2 AND 9 ACTIVITY IN HUMAN CD8<sup>+</sup> T-CELLS AND THYMOCYTES

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**BACKGROUND:** Interleukin-7 (IL-7) regulates the development, homeostasis and cytotoxic (CTL) activity of CD8<sup>+</sup> T-cells. IL-7 down-regulates the expression of the membrane bound IL-7 receptor  $\alpha$  chain (mCD127) and induces the release of a soluble form (sCD127). sCD127 alters IL-7 activity and plasma concentrations are increased in the course of HIV infection. Despite the potential biological importance of sCD127, the mechanisms of its production and release have been only partially described.

**METHODS:** Human thymocytes and blood-isolated CD8<sup>+</sup> T cells were treated with IL-7 (10ng/mL) and TcR-stimulating antibodies (anti-CD3/CD28 1 $\mu$ g/ml each). Culture supernatants were collected every 24 hours over 96 hours and sCD127 concentration was measured by ELISA. To evaluate the contribution of shedding of mCD127, surface protein biotinylation assays were performed and analyzed through Western blots. To further characterize the signaling pathways leading to the shedding of sCD127, pharmacological inhibitors for JAK, STAT5 and PI3K were also used. Specific MMP2/9 and MMP3 inhibitors were used to evaluate the implication of proteolytic cleavage in sCD127 release. MMP9 and MMP2 levels were measured by specific ELISA to further determine their roles in the release.

**RESULTS:** Biotinylation assays revealed that shedding of mCD127 contributes to the release of sCD127. In combination with pharmacological inhibitors, biotinylation assays also revealed that JAK/STAT5 and PI3K pathways were both involved in the shedding of sCD127 by CD8<sup>+</sup> T-cells. Proteolytic cleavage by MMP2 and 9, but not MMP-3 contributes to IL-7/TcR-induced sCD127 release by CD8<sup>+</sup> T-cells. In human thymocytes both MMP2 and MMP9 were shown to be involved in the basal release of sCD127. MMP9 levels in supernatants decreased upon IL-7/TcR stimulation.

**CONCLUSIONS:** Our results demonstrated that sCD127 release can be mediated by different mechanisms. Firstly, IL-7/TcR stimulation can induce direct shedding of mCD127 from the cell surface, which is mediated by the JAK/STAT5 and PI3K pathways. Secondly, a shedding-independent mechanism of sCD127 production relies on MMP2 and 9 activities. Furthermore, the role of mRNA splicing in the IL-7/TcR-induced release of sCD127 is under investigation.

## Basic Sciences: Other

## Sciences fondamentales : Autres

## BS55

### IMPACT OF ENDOTOXIN EXPOSURE ON THE HEPATIC EXPRESSION OF DRUG TRANSPORTERS IN HIV-1 TRANSGENIC (HIV-TG) RATS

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HIV infected individuals are more prone to develop secondary bacterial infections as well as having elevated levels of bacterial endotoxin which contribute to a chronic state of inflammation. A potentiated inflammatory response occurs in the presence of co-infections due to dysregulated immune cells making them more sensitive to subsequent exposure to bacterial products. As infection-induced inflammation alters the expression of many drug transporters and metabolising enzymes, it is plausible that this may be potentiated in HIV infected individuals due to augmented inflammatory responses. Similar to humans the HIV-1 transgenic rat (HIV-Tg) develops immune disorders and AIDS associated conditions. Therefore, our objective was to examine the impact of endotoxin administration on hepatic gene expression of drug transporters in HIV-Tg rats. Three month old HIV-Tg male and female rats or wild-type littermates (WT) were treated with 5 mg/kg endotoxin or saline (n=4-9/group), animals sacrificed and tissues collected 18 hr later. Gene expression was measured in liver using qRT-PCR and cytokine levels were measured in serum using ELISA. An augmented inflammatory response was seen in the HIV-Tg group, and was associated with significantly greater endotoxin-mediated downregulation of Ent1/Slc29a1 in HIV-Tg rats. In addition, a pronounced endotoxin-mediated downregulation of Abcb1a, Abcc2, Abcg2, Abcb11, Slco1a2, Slco1a4, Slco1b2, Slc10a1, Slc22a1, Cyp3a2 gene expression was seen in the HIV-Tg rats which was similar to WT groups. As several hepatic transporters are involved in the transport of bile salts, we observed significantly higher total bile acid concentrations in the serum of endotoxin-treated HIV-Tg as compared to endotoxin-treated WT. Our results indicate that the endotoxin-mediated downregulation of numerous hepatic transporters in HIV-Tg rats increases the possibility that hepatobiliary drug clearances may be altered in the HIV population due to co-existing infections or inflammatory conditions. This may be important in identifying potential drug-disease interactions.

## BS56

### COMPARISON OF AN IN-HOUSE QUANTITATIVE REAL TIME PCR AND COBAS AMPLIPREP/TAQMAN ROCHE FOR DETERMINATION OF VIRAL LOAD FOR HIV TYPE 1 NON-B

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**Context:** The in-house technical or experimental methods are increasingly recommended for their low cost reagents for the determination of the Viral Load (VL) in resource-limited settings. The objective of this study was to compare the determination of VL from HIV-1 non-B samples by an in-house technique with the COBAS Ampliprep/TaqMan version 2.0.

**METHOD:** In this cross-sectional study, 39 plasma samples from patients infected with HIV type 1 non-B from N'Djamena and Kinshasa were used to determine the VL using the two techniques.

**RESULTS:** The mean values of VL are respectively  $4.68 \pm 1.26$  and  $4.58 \pm 1.33$  log<sub>10</sub> copies of RNA/ml for the COBAS Ampliprep/TaqMan assays and the in-house PCR assays. A good correlation (Spearman Correlation) was obtained, with a coefficient (R<sup>2</sup>) of 0.9452 (p < 0.001).

**CONCLUSION:** This work demonstrates that there is no significant difference between the results of VL determined by the COBAS Ampliprep/TaqMan assays and the in-house assays used.



## BS57

## AN IN VIVO RAT MODEL OF HIV-1 ASSOCIATED BRAIN INFLAMMATION AND NEUROCOGNITIVE DEFICITS

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The prevalence of neurological complications in Human Immunodeficiency Virus-1 (HIV-1) infected patients is dramatically increasing with about 50% of patients developing HIV-associated neurocognitive disorders (HAND). Clinically, these patients appear to be aging prematurely; perhaps due to persistent low-level viral replication and associated inflammation in the brain leading to neuronal loss. The goal of this project is to implement an in vivo rat model of HIV-1 brain inflammation and neurocognitive dysfunction by intracerebroventricular (icv) administration of HIV-1 viral coat protein, gp120, in adult male Wistar rats and to investigate the effect of anti-inflammatory compounds on both the inflammatory/oxidative stress responses and prevention/improvement of neurocognitive deficits. Anesthetized rats were injected icv with a single dose of R5-tropic gp120-ADA in both lateral ventricles (4 $\mu$ g/ventricle). Lipopolysaccharide (LPS), a bacterial endotoxin that has been reported to induce inflammation and behavioural abnormalities, was administered icv as a positive control. Real-time qPCR was used to assess gene expression of inflammatory/oxidative stress markers in different regions of the brain. Cognitive deficits in spatial learning and memory were characterised using the Morris Water Maze test. Immunoblotting of caspase-3 and terminal deoxynucleotidyl transferase dUTP nick end labeling (TUNEL) will be used to examine extent of neuronal apoptosis and death. Our data demonstrate high levels of cytokines (IL-1b and TNFa) and oxidative stress marker (iNOS) transcripts in the brain post injection of gp120/LPS compared to control saline. Rats injected with a single dose of 50 $\mu$ g LPS displayed significantly impaired spatial learning/memory compared to saline controls. However, gp120 injection did not result in significant impairments, possibly due to insufficient neuronal apoptosis. Additional biochemical analyses are in progress to characterise expression of the apoptotic marker caspase-3 and DNA fragmentation. Our gp120 and LPS-induced neuroinflammatory rat model could constitute a useful tool to examine the potential effect of anti-inflammatory drugs in reversing HAND.

## BS58

## ENDOTOXIN MODULATES THE RENAL EXPRESSION OF DRUG TRANSPORTERS IN HIV-1 TRANSGENIC RAT MODEL

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**BACKGROUND:** Transporters expressed in the kidney can impact the renal clearance of many drugs including antiretroviral agents. Bacterial co-infections, low grade endotoxemia and immune activation are common in chronic HIV (+) patients. Inflammation due to endotoxin or HIV may influence the expression and activity of drug transporters in the kidney. The HIV-transgenic (HIV-Tg) rat develops immune dysfunction and AIDS associated conditions similar to humans. Thus, our objective was to study the effect of endotoxin on the renal expression of drug transporters in an HIV1-Tg rat model.

**METHODS:** Five month male HIV1-Tg rats or wild-type (WT) littermates were treated with endotoxin (5 mg/Kg, i.p.) or saline (n=7/group). The mRNA expression of transporters and cytokines were measured 18 hours after treatment in kidney samples using qRT-PCR. Serum cytokine levels were measured by ELISA.

**RESULTS:** As compared to WT, basal expression of IL-1 $\beta$ , IL-6, Oat2 and Urat1 was significantly higher in HIV-Tg rats while OCT1 levels were decreased. Endotoxin induced serum levels of inflammatory cytokines in both HIV1-Tg and WT, however interferon induction was significantly diminished in HIV-Tg. Endotoxin significantly down-regulated the expression of Mdr1, Oct3, Oat2, Urat1, Mate1 and Pept2 in both HIV-Tg and WT. Endotoxin significantly up-regulated the expression of Oct1 and Pept1 in HIV1-Tg but not WT. Levels of Mdr1b, Mrp4 and Octn2 were not changed.

**CONCLUSION:** Our results demonstrate that HIV and endotoxin-induced inflammation imposes alterations in the expression of many clinically important drug transporters in the kidney. Therefore the renal clearance

of drug substrates could be altered in patients with co-existing infections. This may provide new insight to potential drug-disease interactions.

## BS59

## HIV-1 NUCLEOSIDE ANALOGUES INHIBIT EBOLA VIRUS REPLICATION: NEW APPLICATION OF CART

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Toronto, ON

**BACKGROUND:** The unprecedented Ebola outbreak in West Africa has infected 20,206 people and claimed 7,906 lives, destabilizing medical infrastructure and preventing the proper treatment of other infections such as HIV-1. Experimental nucleoside analogues that inhibit Ebola RNA replication, such as brincidofovir and favipiravir, are being fast-tracked for the potential treatment of Ebola virus disease (EVD). However, it remains untested whether potent nucleoside inhibitors with well established safety and efficacy in treating HIV-1 show effectiveness in inhibiting Ebola.

**METHODS:** We infected 293 T cells with transcription and replication competent virus-like particles (trVLPs) related to *Zaire Ebolavirus*. A luciferase reporter gene in the viral minigenome was measured four days post-infection to quantify viral replication. Cells were treated prior to, during or post-infection with toremifene (+ve control), maraviroc (-ve control), favipiravir, cidofovir (active metabolite of brincidofovir), or with HIV-1 nucleoside analogue inhibitors lamivudine, zidovudine or tenofovir.

**RESULTS:** 5 $\mu$ M of lamivudine, zidovudine or tenofovir inhibited the transcription and/or translation of Ebola by 49-62%, and combination of these three analogues caused an additive inhibition of Ebola replication by as much as 87%, and outperformed all other drugs tested. This increased to 97% by the second passage of cells. Maraviroc had no effect.

| Drug treatment                      | Drug concentration, $\mu$ M | Luciferase activity, % relative to infected cells | p-value, relative to infected cells |
|-------------------------------------|-----------------------------|---|-------------------------------------|
| uninfected cells                    | --                          | 1.09% ( $\pm$ 0.61)                               | <0.001                              |
| infected cells                      | --                          | 100.00% ( $\pm$ 13.73)                            | --                                  |
| toremifene                          | 5                           | 28.03% ( $\pm$ 12.39)                             | <0.01                               |
| cidofovir                           | 100                         | 19.73% ( $\pm$ 5.78)                              | <0.01                               |
| favipiravir                         | 100                         | 14.06% ( $\pm$ 3.16)                              | <0.001                              |
| lamivudine + zidovudine + tenofovir | 5                           | 17.00% ( $\pm$ 5.39)                              | <0.01                               |

**CONCLUSIONS:** Our results demonstrate that widely available nucleoside analogues clinically used to treat HIV-1 show activity against Ebola. Moreover lamivudine, zidovudine and tenofovir are on the WHO list of Essential Medicines and could be used in resource-limited settings. Thus combination antiretroviral therapy (cART), successful at treating HIV-1, may be effective for treating EVD.

## Clinical Sciences: Adherence

## Sciences cliniques : Respect du traitement

## CS01

## ASSESSMENT OF FACTORS ASSOCIATED WITH TRANSITIONS BETWEEN OPTIMAL AND SUB-OPTIMAL HIV CARE STATES

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**BACKGROUND:** Engagement in HIV care is critical to achieving and maintaining optimal health outcomes. We wished to determine factors associated with transitions among recommended and low engagement care states.

**METHODS:** We analysed data from OHTN Cohort Study participants who had initiated cART and achieved virologic suppression, completed  $\geq 1$  extended questionnaire, and had  $\geq 2$  viral load (VL) results within 2 years of a questionnaire. Six states of HIV care were defined: (1) cART Initiation: first year after the first observed undetectable VL, (2) suppressed VL (VL < 50 copies/mL), (3) engaged: unsuppressed VL, < 6 months since last VL, (4) unengaged: unsuppressed VL, > 6 months since last result, (5) loss to follow-up and (6) death. Multi-state models were used to determine hazard ratios (HR) of transitioning between states 2 and 3, and between states 3 and 4 associated with time-updated covariates.

**RESULTS:** 1338 participants were included. At baseline, 81% were male, 9% were IDU, with median age of 40 (IQR 34-47), depression score of 20 (IQR 6-40), and total stress score of 5 (IQR 3-8). Transitions between engaged and unengaged states were more likely in later calendar years and less likely among women, relative to MSM. Older participants were more likely to maintain virologic suppression and re-achieve it after virologic failure. Higher levels of depression were associated with increased risk of virologic failure and higher levels of stress were associated with lower likelihoods of re-achieving virologic suppression.

|                                | VL Failure          | VL Success          | Disengagement       | Re-engagement       |
|--------------------------------|---------------------|---------------------|---------------------|---------------------|
|                                | State2-State3       | State3-State2       | State3-State4       | State4-State3       |
|                                | HR (95% CI)         | HR (95% CI)         | HR (95% CI)         | HR (95% CI)         |
| Calendar Year                  | 0.81<br>(0.77-0.86) | 1.00<br>(0.96-1.04) | 1.24<br>(1.08-1.42) | 1.39<br>(1.18-1.63) |
| Age<br>(per 5 years)           | 0.94<br>(0.89-0.99) | 1.08<br>(1.04-1.13) | 0.93<br>(0.84-1.03) | 0.98<br>(0.86-1.12) |
| Females<br>(ref=MSM)           | 1.02<br>(0.81-1.29) | 0.97<br>(0.79-1.19) | 0.45<br>(0.28-0.71) | 0.34<br>(0.20-0.60) |
| Heterosexual Male<br>(ref=MSM) | 0.91<br>(0.70-1.19) | 0.90<br>(0.72-1.13) | 1.40<br>(0.62-3.13) | 1.32<br>(0.48-3.61) |
| Injection drug use             | 1.03<br>(0.75-1.42) | 0.98<br>(0.75-1.28) | 0.87<br>(0.47-1.61) | 0.59<br>(0.28-1.25) |
| Depression<br>(per 5 points)   | 1.04<br>(1.02-1.06) | 1.01<br>(0.99-1.02) | 0.99<br>(0.94-1.03) | 1.00<br>(0.94-1.06) |
| Stress<br>(per event)          | 1.00<br>(0.98-1.03) | 0.96<br>(0.94-0.98) | 1.04<br>(0.98-1.10) | 0.98<br>(0.91-1.04) |

**CONCLUSION:** Management of stress and depression and understanding barriers to care among women may improve engagement in HIV care.

## CS02

## DIFFERENCES IN ANTIRETROVIRAL TREATMENT INTERRUPTION BETWEEN ABORIGINAL PEOPLES AND OTHER ETHNIC GROUPS IN A MULTISITE COHORT OF PEOPLE LIVING WITH HIV IN CANADA

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<sup>1</sup>Vancouver, BC; <sup>2</sup>BC; <sup>3</sup>Dartmouth, NS; <sup>4</sup>Toronto; <sup>5</sup>Thunder Bay, ON; <sup>6</sup>Burnaby, BC; <sup>7</sup>Ottawa, ON; <sup>8</sup>Montreal, QC

**INTRODUCTION:** Building Bridges was a collaboration between Aboriginal and allied stakeholders and the Canadian Observational Cohort (CANOC) collaboration. Working with community and CANOC investigators, a review of treatment interruptions was identified as a proxy for health care engagement. Accordingly, this endpoint of interest was compared between Aboriginal and non-Aboriginal CANOC participants.

**METHODS:** CANOC participants are antiretroviral treatment-naïve individuals who initiated combination antiretroviral therapy (cART) after January 1, 2000. Cox proportional hazard models were used to estimate the effect of ethnicity on time to treatment interruption. Treatment interruptions were defined as interruptions of all antiretroviral medications for at least 90 consecutive days. Models were adjusted for age, gender, injection drug use, calendar year of cART initiation and province of residence.

**RESULTS:** A total of 8260 participants, including 416 Aboriginal participants, were included in the analysis. 197 (47%) Aboriginal participants and 1498 (18%) non-Aboriginal participants had a treatment interruption. The median time to a first treatment interruption after treatment initiation was shorter among Aboriginal participants (0.55 years) than among participants of other ethnicities (1.07 years) ( $p < 0.001$ ). In Cox regression analysis, Aboriginal ethnicity (adjusted hazard ratio [aHR]=1.39, 95% CI: 1.19-1.63), residing in British Columbia (aHR=1.80, 95% CI: 1.61-2.01), injection drug use (aHR=2.43, 95% CI: 2.16-2.72), and female gender (aHR=1.59, 95% CI: 1.42-1.77) remained independent predictors of increased risk of treatment interruption. Treatment interruptions were less likely in later calendar years (aHR=0.67, 95% CI: 0.59-0.76 for 2003-05, aHR=0.48, 95% CI: 0.41-0.54 for 2006-08 and aHR=0.33, 95% CI: 0.28-0.38 for 2009-12 relative to 2000-02).

**CONCLUSION:** Among CANOC participants initiating cART, Aboriginal participants were found to have a shorter time to treatment interruption. Efforts to provide culturally safe care and facilitate continuity of care, particularly among mobile populations may be helpful in reducing treatment interruptions among Aboriginal people living with HIV, particularly women. Injection drug use was also found to be a significant predictor of treatment interruption and interventions are needed to support consistent ART use among populations who use injection drugs.

## CS03

## THE CLINICAL IMPORTANCE OF MAINTAINING THE CONTINUITY OF CARE BETWEEN HIV CARE CENTRES

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**BACKGROUND:** Continuity of care is well recognised within HIV care programs for effective HIV management but there is less focus on maintaining continuity between HIV care centers. We compared the clinical profiles of patients before and after transferring care to the Southern Alberta Clinic (SAC) in order to determine the clinical impact of disruptions in the continuity of care as a consequence of moving between HIV care centres.

**APPROACH:** HIV patients transferring to SAC from another care centre within Canada between 1/1/2006-1/1/2013 were reviewed. We determined the patient's CD4, Viral Load, and ART status at last date of prior clinic contact and the first clinic contact date at SAC. We categorized patients as 'continuous care patients' (CCP) or 'non-continuous patients' (NCCP) based on the time gap between visits ( $\pm 180$  days respectively).

We analyzed the impact on clinical factors between continuous versus non-continuous patients.

**RESULTS:** 193 HIV-experienced individuals transferred care to SAC. The median time from last to initial SAC visit was 134 days [80-324]. 42% of patients were on ART at first SAC visit. Median CD4 count decreased from 410/mm<sup>3</sup> to 371/mm<sup>3</sup>. 47% of all transfer patients had detectable viral loads (i.e. >400) at first SAC visit. NCCP had longer gaps in treatment (median 431 vs. 94 days), had steeper declines in median CD4 counts (460/mm<sup>3</sup> to 272/mm<sup>3</sup> vs. 400/mm<sup>3</sup> vs. 407/mm<sup>3</sup>), and had higher proportions of detectable viral loads (61.2% vs. 41%) (all p<0.01) respectively.

**DISCUSSION:** Almost 50% of patients transferring care had detectable viral loads, and >25% had major gaps in care. Patients accessing care within 6 months, following recommended guidelines, had only minimal changes in health whereas patients delaying care had significant decreases in CD4 and higher rates of unsuppressed viremia. It is clinically important for patients to maintain HIV care when transferring between HIV care centers.

## CS04

### PATIENTS REMAIN HIGHLY ADHERENT TO TREATMENT DESPITE THE NON-NEGLECTIBLE DISTURBANCE CAUSED BY ARVS

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Montreal, QC

**BACKGROUND:** The ultimate goal of antiretroviral therapy (ART) is to control HIV replication while minimizing adverse drug reactions (ADRs). Despite their potency and efficacy, many ARVs cause adverse effects and can compromise patient adherence. This study aims to assess the burden of ADRs on treatment satisfaction and adherence among HIV patients.

**METHODS:** During July and August 2014, we conducted a cross-sectional study on ADRs of ARVs at Clinique l'Actuel. All HIV-patients attending a follow-up visit received an auto-administered questionnaire about potential ADRs, ART satisfaction and self-reported adherence. Physicians also answered questions regarding their perception of the ADRs reported by the patients. The data was analysed using correlation and logistical regression analyses.

**RESULTS:** 361 treated HIV-patients were included. Mean age was 50y. Patients were infected for 15 y and 114 (32%) were on their first-line treatment. 86% were MSM, 8% IDU and 4% from endemic regions. Globally, 81% were very satisfied with their ART, despite 95% reporting ADRs (73% CNS problems, 63% less energy, 61% sexual problems, 61% GI, 51% sleeping, 42% dermatological problems). Nevertheless, 81% were highly disturbed by the ADRs. The most disturbing ADRs were sleep (42%) and sexual (42%) problems. In the adjusted model, the presence, number and types of ADRs were not significantly associated with satisfaction. Only IDU were significantly unsatisfied with ARVs (OR=0.36;p=0.016). Moreover, adherence to treatment was higher in men (OR=6.22;p=0.005) and among those who were satisfied with their ARVs (OR=3.13;p=0.034) when controlling for type and number of ADRs, pill burden and other covariables. Physicians discussed the reported ADRs in 79% of cases and felt that ADRs were mostly unrelated to ART. Medication was changed in 19 patients (5%).

**CONCLUSION:** Our results underlined the high frequency and disturbance of ARV-related adverse drug reactions. However, ADRs did not preclude adherence to treatment for our patients.

## CS06

### HOUSING AND MULTIDISCIPLINARY CARE WITH HIV TREATMENT PROGRAMS SUPPORT ANTIRETROVIRAL ADHERENCE AMONG HIV AND HEPATITIS C CO-INFECTED INDIVIDUALS

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<sup>1</sup>Burnaby; <sup>2</sup>Vancouver, BC; <sup>3</sup>Sudbury, ON

**BACKGROUND:** Hepatitis C virus (HCV) is both a risk factor for and common comorbidity associated with HIV. Individuals with HIV/HCV co-infection face serious health risks including risk of end-stage liver

disease and mortality. The purpose of this study was to compare socio-demographic and clinical characteristics between HIV/HCV co-infected and HIV mono-infected individuals and to determine covariates of optimal ART adherence among co-infected individuals enrolled in a large cohort of HIV-positive individuals in British Columbia, Canada.

**METHODS:** The study utilizes survey data from the Longitudinal Investigations into Supportive and Ancillary Health Services (LISA) study collected between 2007 and 2010 by the British Columbia Centre for Excellence in HIV/AIDS. This cross-sectional data is linked with longitudinal clinical data through the provincial Drug Treatment Plan (DTP). HCV co-infection was determined through self-report. Optimal ART adherence was defined as ≥95% based on pharmacy refill compliance. Multivariable logistic regression models compared optimal adherence by HIV/HCV co-infection, as well as independent covariates of optimal ART adherence among co-infected individuals.

**RESULTS:** Of 912 individuals (28.2% women) included in this analysis, 536 (58.8%) were HIV/HCV co-infected. In adjusted multivariable analysis, co-infected individuals were significantly more likely to have a history of IDU (adjusted odds ratio [AOR]: 20.8; 95% confidence interval [CI]: 11.2 to 38.5) and incarceration (AOR: 2.52; 95% CI: 1.41 to 4.51), and less likely to be optimally adherent (AOR: 0.53; 95% CI: 0.28 to 0.99). Optimal adherence among HIV/HCV co-infected participants was associated with stable housing (AOR: 1.86; 95% CI: 1.14 to 3.05) and accessing an adherence support program (AOR: 4.76; 95% CI: 2.62 to 8.57).

**CONCLUSIONS:** HIV/HCV co-infected individuals exhibit significantly lower ART adherence than HIV mono-infected individuals, however, stable housing and adherence support services were associated with improved adherence within this population. The findings highlight the importance of integrating social services within treatment programs.

## CS07

### ASSOCIATION OF DEMOGRAPHIC, CLINICAL AND PSYCHOSOCIAL FACTORS WITH MISSED CLINIC VISITS AT A TERTIARY CARE CENTRE

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**INTRODUCTION:** Retention in care is associated with improved clinical outcomes. Our objectives were to report the frequency of and risk factors for missing physician visits and having gaps in care, as measures of suboptimal retention.

**METHODS:** Patients attending the Toronto General Hospital Immunodeficiency Clinic with ≥1 kept visit and ≥12 months of follow up between 2004 and 2014 were studied. A sub-analysis of OHTN Cohort Study (OCS) participants was conducted for questionnaire measures within 6 months of a scheduled visit. Multivariable generalized estimating equation models identified factors associated with (1) missed visits with HIV specialists and (2) inter-visit intervals ≥12 months.

**RESULTS:** 1585 patients were included, of whom 602 were in the OCS. OCS participants were older and more likely to be white and MSM than non-OCS participants. 15% of visits were missed. 70% of patients missed ≥1 visit and the median (IQR) rate of missed visits per patient was 11% (0, 27%). 6% of inter-visit intervals were ≥12 months and 45% of patients had ≥1 12 month interval. Among all participants, factors associated with missed visits were younger age (OR=1.34 per 10 years, p<0.0001), black race (OR=1.34 vs. white, p<0.001), other non-white race (OR=1.21 vs. white, p=0.01), IDU (OR=1.94, p<0.0001), longer HIV duration (OR=1.02 per year, p<0.01), VL ≥ 50 (OR=1.11, p=0.03), and winter season (OR=1.12 vs. fall, p=0.01). In the OCS sub-analysis, participants without children living at home were more likely to miss a visit (OR=1.64 vs. no children, p<0.01). Notably, stress and depression were not independently associated with missing a visit. Factors associated with intervals ≥12 months were: younger age (OR=1.24 per 10 years, p<0.0001), white race (OR=1.35 vs. other race, p<0.01), VL ≥ 50 (OR=1.17, p=0.03), and higher CD4 count (OR=1.05 per 100 cells/mm<sup>3</sup>, p<0.01).

**DISCUSSION:** Although attendance at clinic visits at this tertiary care center was high relative to other centers, continued efforts are needed to maximize visit attendance.



## Clinical Sciences: Clinical Trials and Observational Studies of Antiretrovirals and Other HIV Therapies

### Sciences cliniques : Essais cliniques et études d'observation des antirétroviraux et autres thérapies anti-VIH

#### CS08

##### COMPARISON OF ATAZANAVIR/RITONAVIR (ATA/R) AND DARUNAVIR/RITONAVIR (DRV/R)-BASED ANTIRETROVIRAL THERAPY FOR ANTIRETROVIRAL NAÏVE PATIENTS

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**BACKGROUND:** Once daily atazanavir/ritonavir (ATA/r) and darunavir/ritonavir (DRV/r) are both recommended as protease-inhibitor-based regimens for antiretroviral naïve patients. To date, only one study has compared these two options.

**METHODS:** Participants of the Canadian Observational Cohort (CANOC) collaboration whose first regimen included either ATA/r or DRV/r were studied. Fine and Gray models accounting for the competing risks (CR) of death and discontinuation were used to examine differences between regimens with regard to (1) time to virologic suppression (viral load (VL) <50 copies/mL on two occasions ≥30 days apart), (2) time to virologic failure (VL >1000 copies/mL at or after week 16 or > 200 copies/mL at or after week 24) and (3) time to discontinuation of DRV/r or ATV/r (CR of death only).

**RESULTS:** 1847 participants started on ATA/r and 234 started on DRV/r. Patients on ATA/r were more likely to be female (19% vs 12%,  $p=0.01$ ), IDU (29% vs 9%,  $p<0.0001$ ), and from BC (68% vs 17%,  $p<0.0001$ ). 109 participants died during the study period. After adjusting for age, gender, race, MSM, IDU, province, baseline CD4, baseline VL, calendar year and rate of VL measurement, the hazard ratio (HR) and 95% confidence interval (CI) of virologic suppression for patients on ATA/r relative to those on DRV/r was 1.02 (0.84, 1.23),  $p=0.86$ . After adjusting for the same covariates, the HR (95% CI) of virologic failure for patients on ATA/r relative to those on DRV/r was 1.46 (0.81, 2.64),  $p=0.21$ . After adjustment for covariates, the HR (95% CI) of treatment discontinuation for ATA/r vs DRV/r in BC, Ontario and Quebec were 1.84 (0.95, 3.57), 2.10 (1.28, 3.44) and 1.14 (0.76, 1.71) respectively. Sensitivity analyses including men only to avoid pregnancy-related regimen changes yielded similar results.

**CONCLUSIONS:** There was no significant difference in rates of virologic suppression or failure among naïve patients starting DRV/r and ATA/r. Differences in treatment discontinuation varied regionally.

#### CS09

##### DEVELOPMENT OF AN ALGORITHM TO IMPUTE CURRENT ARV THERAPY REGIMENS: APPLICATION TO THE ONTARIO HIV TREATMENT NETWORK COHORT STUDY (OCS)

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**INTRODUCTION:** In cohort studies for which antiretroviral (ARV) medication data is extracted from medical records, missing start and stop dates may prevent accurate determination of current and cumulative exposures to ARVs.

**METHODS:** We developed an algorithm to impute missing or improbable start and stop ARV dates in consultation with HIV specialist physi-

cians and pharmacists. Twelve rules (5 for NRTIs/7 for other classes) were developed using information on past history of ARVs, the formulation of the medication, class of ARV, number of other medications in that class, virologic suppression, and prescribing patterns for specific ARVs. The algorithm was applied to chart-abstracted ARV data of participants in the OHTN Cohort Study (OCS). We validated imputed dates via record linkage with Ontario Drug Benefit Program (ODBP) data. Before application of the algorithm, ARVs with missing stop dates were assumed to be active until the later of last follow-up or December 31, 2012.

**RESULTS:** 4080 OCS participants had ≥1 ARV record in the ODBP. The algorithm imputed ≥1 ARV date for 37% of participants. Among 2354 participants who received ARVs through the ODBP for whom the algorithm did not change any dates, the 50th%ile, (75th%ile, 90th%ile) of the difference between cumulative exposure to all ARVs as calculated using the OCS versus ODBP databases was 1.3 years (4.3, 9.4). For 1546 participants with ≥1 imputed date, these values were 6.9 (15.4, 27.8) before and 2.5 (7.9, 15.2) after the algorithm was applied. The ARVs with the greatest reduction in cumulative exposure were efavirenz, lamivudine and abacavir. The rule resulting in the most improvement applied a stop date to existing NRTIs on the date that 2 new NRTIs were started.

**CONCLUSIONS:** Application of the ARV algorithm to chart-abstracted data improved the accuracy of cumulative ARV exposure. The ODBP is not a gold standard comparison, however, since participants may access ARVs through multiple sources and since prescription data may overestimate ARV exposure.

#### CS10

##### COMBINATION THERAPY WITH STRIBILD PLUS DARUNAVIR ONCE DAILY IN ANTIRETROVIRAL-NAÏVE AND TREATMENT EXPERIENCED PATIENTS: A RETROSPECTIVE REVIEW

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**BACKGROUND:** Patients with HIV drug-resistant virus often require complex antiretroviral (ARV) regimens. Since the fixed dose combination tablet Stribild (TDF/FTC/EVG/cobi) contains the pharmacoenhancer cobicistat, it may be suitable for concomitant boosting of protease inhibitors such as darunavir (DRV), potentially providing a simple once daily regimen for patients with drug-resistance.

**METHODS:** We reviewed all patients prescribed TDF/FTC/EVG/cobi+DRV at St. Michael's Hospital Positive Care Clinic between 09/2013 and 11/2014, and summarized reasons for selecting this regimen, virologic and immunologic responses, tolerability, discontinuations, and drug concentrations where available.

**RESULTS:** Thirteen patients were evaluated. Median (interquartile range) age was 43 (38,48), duration of HIV-positivity 18 (6,22) years, and median baseline CD4-cell count 164 (32,462) cells/mm<sup>3</sup>. Median baseline viral load (VL) was 4703 (105,123137) copies/mL and 3 of these patients were virologically suppressed at time of switch. Eleven patients were treatment-experienced; this group had experienced a median of 5 (3,7) prior regimens, most recently including a median of 5 (4,7) ARV pills/day. Reasons for selecting TDF/FTC/EVG/cobi+DRV included simplification ( $n=10$ ), non-adherence ( $n=6$ ), virologic failure ( $n=3$ ), and toxicity ( $n=1$ ). Patients had a median of 3 NRTI, 1 NNRTI, 1 PI, and no INSTI resistance mutations at baseline. Median follow-up at time of writing was 15 (12,34) weeks, during which 7 patients achieved or maintained virologic suppression, 2 had ongoing viremia, 2 had results pending, 1 was lost to follow-up and another did not start treatment due to lack of drug coverage. There were no discontinuations for intolerance and no medication-associated serious adverse events. The DRV trough concentration in the single patient tested was low at 0.1 mg/L, despite VL<40 copies/mL, likely due to incorrect dosing prior to testing.

**CONCLUSION:** In this small observational sample, once daily TDF/FTC/EVG/cobi+DRV appears safe and effective. Further data are needed on this simple 2-tablet option for selected patients with HIV drug resistance.

## CS11

### SIMPLIFIED ANTIRETROVIRAL THERAPY WITH STRIBILD & DARUNAVIR FOR TREATMENT-EXPERIENCED PATIENTS

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Vancouver, BC

**BACKGROUND:** Antiretroviral therapy options for treatment-experienced patients are more limited, and often consist of multiple tablets administered twice daily. The availability of single tablet regimens including integrase inhibitors may provide the rationale for simplified regimens in this population.

**METHODS:** We identified treatment-experienced patients in whom a change in therapy was indicated to address questions of virologic failure, toxicity or regimen complexity. The combination of Stribild and Darunavir was selected as it could be administered as 2 tablets once daily, would be generally well tolerated and is currently being evaluated in clinical trials, despite a possible negative drug interaction profile that may decrease potency. Patients were followed prospectively to monitor the efficacy and toxicity of the new regimen.

**RESULTS:** To date, we have evaluated 11 patients, 9 male, 5 PWID, median age 56 years. Median baseline CD4 count and viral load were 580 cells/mm<sup>3</sup> and < 40 copies/mL, with patients taking a median of 5 tablets (1-8)/day prior to the study. The median duration of follow-up on Stribild and Darunavir was 207 (59-299) days. At last follow-up, 9/11 had full virologic suppression, with low-level viremia (< 200 copies/mL) documented in the other 2 cases. The median CD4 count remained at 501 cells/mm<sup>3</sup>. No significant toxicity of the regimen has been observed, and 11/11 patients remain on the study regimen. Data on 2 additional subjects initiating study therapy will be presented.

**CONCLUSIONS:** The combination of Stribild and Darunavir offers a simple, well tolerated and effective regimen to be considered in treatment-experienced patients. The predicted negative pharmacokinetic interaction does not appear to translate into decreased potency. Additional studies are needed in larger homogeneous populations (such as patients with multi-drug resistant virus or those on more complex and poorly tolerated regimens) to define the usefulness of this novel regimen in clinical practice.

## CS12

### THE EFFECT OF MARAVIROC ON LIVER FIBROSIS

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**BACKGROUND:** Preliminary data suggest a beneficial effect of Maraviroc (MVC)-based antiretroviral therapy on short-term increase in serum mediators of fibrogenesis and non-invasive markers of liver fibrosis in HIV/HCV co-infected patients. We sought to confirm these data in patients newly initiating MVC-based regimens and in whom ongoing evaluation of liver fibrosis was available.

**METHODS:** We identified 50 patients receiving MVC at an inner city clinic. A retrospective chart review was undertaken to collect data on demographic and laboratory data and specific antiretroviral therapy. AST-to-Platelet Ratio Index (APRI) and Fibrosis-4 (Fib-4) scores were calculated based on laboratory results within 3 months before starting MVC-based therapy and at the most recent visit. The percentage change in these parameters was calculated and correlated with relevant variables (paired sample t-test): virologic suppression, HCV co-infection, NRTI backbone, recreational drug and alcohol use.

**RESULTS:** Subjects were predominantly male (41/50) and more frequently PWID (46%) with a mean age of 50.6 years. HCV co-infection was present in 20 patients (40%). APRI and Fib-4 scores were improved all in patient categories (0.07 & 0.12 respectively) with statistical significance reached in patients being on MVC for more than one year (0.14 & 0.23, p<0.05). Mean change of APRI and Fib-4 scores were higher in mono-infected (0.11 & 0.16) compared to co-infected (0.02 & 0.08) patients (p = NS). In patients receiving Truvada, mean changes in APRI (0.29) & Fib-4 (0.50) were the most significant.

**CONCLUSIONS:** MVC use was associated with improvement in liver fibrosis, an effect which seems to increase over time. Our data suggest that a prospective study should be designed to evaluate the long-term clinical significance of this effect in HIV and HIV/HCV infected popula-

tions, with a particular interest in serial FibroScan measurements and co-infected subjects with significant pre-existing fibrosis who are successfully treated for their HCV infection.

## CS13

### LONG-TERM DOLUTEGRAVIR MONOTHERAPY MAINTAINS VIROLOGIC SUPPRESSION – AN ACCIDENTAL CASE IN A HIGHLY-ADHERENT PATIENT

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**BACKGROUND:** Dolutegravir (DTG) is a second-generation HIV-1 integrase inhibitor which is now approved for use in treatment-naïve and treatment-experienced individuals. Multiple phase III investigations and extensive clinical experience to date with DTG have failed to reveal evidence of the development of any drug-resistant mutations against DTG, suggesting that it may be unique amongst all antiretroviral agents in having a very high barrier to resistance. DTG may be a potential candidate for monotherapy studies, but limited clinical experience exists on long-term DTG monotherapy. We report a unique case of an individual who accidentally switched to DTG monotherapy for over eight months, but remained virologically suppressed.

**CASE SUMMARY:** A 49-year-old man with hypertension and dyslipidemia was diagnosed with HIV in 2012 and started on an antiretroviral regimen consisting of raltegravir (RAL) and tenofovir/emtricitabine (TDF/FTC). He quickly achieved virologic suppression and his adherence to medications was perfect. In March of 2014, he expressed a desire to simplify his regimen and RAL was switched to DTG to provide a once-daily regimen. Due to miscommunication, after this intended switch he discontinued TDF/FTC and continued on DTG monotherapy until December of 2014, a period of over eight months. During the monotherapy period, the patient reported perfect adherence to medications. Two HIV viral load results from late June and early December of 2014 both were less than 40 copies/mL. TDF/FTC was added back to his regimen after his viral load in December was confirmed as being undetectable.

**CONCLUSIONS:** To the best of our knowledge, this is the first clinical report of long-term DTG monotherapy in a patient with chronic HIV-1 infection. In our highly-adherent patient, an unintended switch to DTG monotherapy maintained virologic suppression for over eight months. DTG monotherapy may be feasible with its favorable tolerability, interaction, and resistance profiles, and warrants further clinical investigation.

## Clinical Sciences: Resistance

## Sciences cliniques : Résistance

## CS14

### INTEGRATED ANALYSIS OF EMERGENT DRUG RESISTANCE THROUGH 48 WEEKS FROM CLINICAL STUDIES OF HIV-1 TREATMENT-NAÏVE SUBJECTS RECEIVING EVG/COBI/FTC/TAF

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**BACKGROUND:** Tenofovir alafenamide (TAF), a novel prodrug of the NtRTI tenofovir (TFV), more efficiently loads lymphocytes with TFV-diphosphate compared to the current prodrug tenofovir disoproxil fumarate (TDF). The fixed-dose combination of elvitegravir (EVG)/cobicistat (COBI)/emtricitabine (FTC)/TAF (E/C/F/TAF) has been evaluated in one Phase 2 and two Phase 3 randomized, double-blinded studies in treatment-naïve subjects, comparing E/C/F/TAF to E/C/F/TDF. The TAF-containing arm demonstrated non-inferiority to the TDF-containing comparator arm in both Phase 3 studies at Week 48 with >90% of patients achieving HIV-1 RNA <50 copies/mL. An integrated resistance analysis across these 3 studies was conducted.

**METHODS:** HIV-1 resistance testing was conducted using commercial assays to assess PR/RT/IN susceptibility to study drugs. Patients with

HIV-1 RNA >400 copies/mL at time of virologic failure were evaluated for resistance.

**RESULTS:** HIV-1 subtype B was found in 87% of the 1903 treated patients. Pre-existing primary resistance-associated mutations (RAMs) were detected at baseline: 7.5% had NRTI-RAMs, 18.2% had NNRTI-RAMs, and 3.4% had PI-RAMs. HIV-1 subtype or baseline RAMs did not influence treatment response at Week 48. In the E/C/F/TAF group, 19 patients qualified for on-treatment resistance analyses (1.9%; 19/978). Seven patients (0.7%, 7/978) developed NRTI-RAMs (K65R, n=1; M184V/I, n=7), including 5 patients that developed primary INSTI-RAMs (T66A, n=2; E92Q, n=2; Q148R, n=1; N155H, n=1). In the E/C/F/TDF group, 22 patients qualified for on-treatment resistance analyses (2.4%; 22/925). Seven patients (0.8%, 7/925) developed NRTI-RAMs (K65R, n=2; K70K/E, n=1; M184V/I, n=7), including 4 patients that developed primary INSTI-RAMs (E92Q, n=3; Q148R, n=2). Similar patterns of emergent mutations were observed in each treatment group.

**CONCLUSIONS:** E/C/F/TAF achieved a high level of virologic suppression in HIV-1 treatment-naïve patients through 48 weeks of treatment. Presence of PI-, NNRTI-, or NRTI-RAMs at baseline did not affect treatment response to either regimen. Emergence of resistance was rare (<1%) and comparable between the 2 arms.

## CS15

### IDENTIFICATION OF LOW FREQUENCY HIV DRUG RESISTANCE BY DEEP SEQUENCING IN UGANDAN PATIENTS FAILING ART WITH SUSCEPTIBLE HIV GENOTYPING BASED ON SANGER SEQUENCING

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**BACKGROUND:** Minority drug resistant HIV-1 variants may eventually be selected under antiretroviral pressure, leading to therapy failure. In a recent study, we described that despite close monitoring and adherence to treatment (Kyeyune et al 2013 AIDS 27:1899), approximately 20% of HIV-infected individuals failing antiretroviral therapy in a Ugandan HIV/AIDS clinic had a susceptible HIV-1 genotype using a Sanger sequencing-based assay.

**METHODS:** In this study, we used a novel HIV-1 genotyping assay based on deep sequencing (DEEPGEN™HIV) to quantify minority HIV-1 drug resistant variants in 75 patients failing antiretroviral therapy in the absence (n=38) and presence (n=27) of mutations detected by Sanger sequencing, respectively.

**RESULTS:** Most of the patients were infected with subtype A (n=36) or D (n=28) HIV-1 strains. Not surprisingly, DEEPGEN™HIV was able to detect all mutations originally detected by Sanger sequencing in the 27 control samples as well as additional drug resistance mutations at frequencies >1% and <20% in most of these patients, e.g., M41L (15.8%), D67N (14%), K70R (14.4%), M184V (19.6%), G190A (9.6%), K103S (11.1%), V106A (2.2%), etc. Low-level drug resistance mutations were detected by DEEPGEN™HIV in 53% (20/38) of patients with susceptible HIV genotyping based on standard Sanger sequencing. Mutations associated with resistance to NRTI (e.g., M41L, D67N, M184V) and NNRTI (e.g. K103N, Y181C) were quantified, ranging from 1% to 17.6%.

**CONCLUSIONS:** Poor or intermittent adherence, which is not uncommon in sub-Saharan Africa, may lead to an increased prevalence of drug resistant virus, which “fades” from dominance in the intra-patient population in the absence of drug pressure. These low-abundance drug resistant variants detected in antiretroviral-experienced individuals failing treatment, may have significant consequences on current or future outcomes, especially if treatment is not modified based on a susceptible HIV-1 genotype (Sanger) report.

## CS16

### HIV DRUG RESISTANCE TESTING BY HIGH-MULTIPLEX “WIDE” SEQUENCING ON THE ILLUMINA MISEQ

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<sup>1</sup>Vancouver, BC; <sup>2</sup>Boston, MA, USA;

**BACKGROUND:** Limited access to HIV drug resistance testing in low- and middle-income countries (LMIC) continues to impede clinical decision-making and population resistance surveillance. We assessed the potential of next-generation sequencing to provide accurate HIV drug resistance genotypes for hundreds of samples simultaneously.

**METHODS:** Plasma samples were collected from participants of a Ugandan cohort (N=349) or from Canadian patients (N=759). Amplicons spanning reverse transcriptase codons 90-234 were prepared for Sanger and MiSeq sequencing. Sanger data were analyzed by in-house software (RECall). MiSeq data were analyzed using an iterative mapping pipeline. Samples with <100-fold coverage at any position were excluded. Minority bases ≥20% were called as mixtures in MiSeq data.

**RESULTS:** Sequencing was successful in 881 (80%) and 892 (81%) samples by Sanger and MiSeq respectively with 832 samples having results by both methods. Samples failing MiSeq had a median pVL 2.7 (IQR=2.4-3.7) log<sub>10</sub> copies/mL. Median depth of MiSeq coverage was ~9,900 (IQR=5,300-13,400) reads/sample. Overall 99.3% nucleotide concordance was observed between methods. The majority (>95%) of discordances were differences in mixture calls, with neither method overcalling mixtures relative to the other (κ=0.72). Resistance mutations (2013 IAS-USA List) were observed in 155 and 154 samples by Sanger and MiSeq respectively. MiSeq achieved 97% sensitivity and 99.4% specificity in detecting resistance mutations identified by Sanger. Technical replicates of a laboratory clone (N=9) and clinical isolate (N=5) indicated a high level of repeatability of the MiSeq results (100% and 98.5% nucleotide concordance). Phylogenetic analysis revealed clustering of samples by subtype and cohort, consistent with expected subtype prevalence in Africa and North America.

**CONCLUSIONS:** Approximately 20% of Canada's annual HIV drug resistance testing was repeated in a single MiSeq run. Accurate MiSeq sequences were obtained for multiple subtypes, suggesting that routine individual testing or annual population resistance surveillance in LMIC could be performed with this strategy.

## Clinical Sciences: Complications of Antiretroviral Therapy

## Sciences cliniques : Complications des thérapies antirétrovirales

## CS17

### ADDRESSING MEDICATION ERRORS IN HIV-POSITIVE INPATIENTS: A CLINICIAN'S GUIDE TO ASSESSING ANTIRETROVIRAL THERAPY

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**OBJECTIVE:** With advancements in pharmacotherapy, HIV is now considered a treatable chronic disease; however, many HIV-infected individuals are hospitalized for other co-morbidities. Due to the complexity of combination antiretroviral (ARV) therapy and the fact that non-specialized clinicians are often unfamiliar with HIV management, very high rates of ARV medication errors in this population have been reported in the literature. The objective of this project was to address the common types of ARV errors by creating an evidence-based educational guide for non-HIV clinicians.

**METHODS:** The project consisted of two phases. Phase 1 involved a comprehensive literature review in order to characterize the types of drug error found in HIV-positive hospitalized patients. Phase 2 consisted of the development of an ARV assessment guide which addressed the types of



drug error found in the literature. The guide was peer reviewed by several HIV pharmacists, an inpatient pharmacist focus group and clinical practice leaders for content, readability and applicability.

**RESULTS:** The guide included both a framework for patient assessment and a collection of useful resources, with the objective of facilitating clinical decisions and minimizing drug-related errors. A 3-step patient assessment framework addressed significant drug errors found on admission, internal unit transfer, and discharge. Hospital-focused patient assessment pointers regarding ARV indication, efficacy, safety, adherence and seamless care were included. Supplementary appendices included information on specific laboratory tests, drug interactions and toxicities, ARV dosing, web-based resources, and provincial HIV team contact information. The guide was posted on the institutional internet website. Implementation and interdisciplinary educational sessions are in progress.

**CONCLUSIONS:** An evidence-based ARV guide for inpatient assessment was developed for non-HIV clinicians in an effort to reduce drug error. This guide is adaptable to various institutions and practice settings and can serve as the basis for education of health care workers and students/residents.

## CS18

### UNDERSTANDING THE INTERVENTIONS MADE BY PHARMACISTS ON HIV TREATMENT IN CANADIAN RETAIL AND HOSPITAL BASED PHARMACY PRACTICES VIA A NOVEL TEXT BASED SURVEY SYSTEM

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**BACKGROUND:** Evidence suggests that pharmacist delivered cognitive services have a significant impact on improving HIV drug management. As the role of pharmacists evolves with expanded scopes of practice and new funding models it is imperative that pharmacists build a body of research to understand the impact of this transformation. This project will deploy a novel text based survey to better understand the impact pharmacist intervention has on drug therapy modifications.

**PRIMARY OBJECTIVE:** To understand the frequency and types of pharmacist interventions that may directly or indirectly lead to a modification of drug therapy for HIV patients.

**SECONDARY OBJECTIVE:** To evaluate the ease of administration, convenience, and utility of a novel text based survey system to collect practice level data.

**METHODS:** A text based survey was sent to twelve participants on Mondays to Fridays for a period of 10 weeks. The first question, "Did you make an intervention today, that may change drug therapy in order to reduce pills, improve tolerability or avoid a DDI", was answered with a y or n. Based on the first answer a second multiple choice question was sent to determine the type of intervention made.

**RESULTS:** 1134 text questions were deployed; response rate of 95.1%. A total of 218 interventions on 49.0% of days were made. The most common intervention made by hospital pharmacists was to improve tolerability at 22%. The most common intervention for retail pharmacists was to reduce pill burden made on 29% of days at work. Of eight respondents to a post study evaluation, 100% agreed that texting was an acceptable method for clinical practice data collection.

**CONCLUSION:** Pharmacists in HIV care are critical members of the health team; delivering disease state management by making regular interventions to reduce pill burden, improve tolerability and avoid drug interactions.

## CS19

### SAFETY OF TENOFOVIR ALAFENAMIDE IN RENAL IMPAIRMENT

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<sup>4</sup>Indianapolis, IN; <sup>5</sup>Fort Pierce, FL, USA; <sup>6</sup>Bangkok, Thailand;

<sup>7</sup>Foster City, CA; <sup>8</sup>Houston, TX; <sup>9</sup>Denver, CO, USA

**BACKGROUND:** Tenofovir disoproxil fumarate (TDF) has been associated with nephrotoxicity and reduced bone mineral density (BMD). Tenofovir alafenamide (TAF), a novel prodrug of tenofovir (TFV), results

in 90% lower plasma TFV levels compared to TDF. Safety and efficacy of elvitegravir/cobicistat/emtricitabine/TAF (E/C/F/TAF) was assessed in HIV-1 infected patients with mild to moderate renal impairment.

**METHODS:** Week 24 efficacy and safety data are described for virologically-suppressed adults with stable eGFR-CG (Cockcroft Gault) of 30 to 69 mL/min who switched from both TDF- and non-TDF-containing regimens to open-label E/C/F/TAF.

**RESULTS:** Of 242 subjects, mean age was 58 years (range: 24–82), 18% Black, 39% hypertension, and 14% diabetes. At baseline, median eGFR-CG was 55.6 mL/min (33% eGFR-CG 30–49 mL/min). At Week 24, the median (Q1, Q3) change from baseline eGFR-CG was –0.4 (–4.7, 4.5) mL/min, eGFR-cystatin C 3.8 (–4.8, 11.2) mL/min/1.73m<sup>2</sup>, and aGFR (n=32, 68.8% TDF at baseline) was 0.1 (–4.3, 4.4) mL/min, indicating that GFR was not affected by E/C/F/TAF. Two subjects (0.8%) discontinued study drug for decreased GFR by eGFR-CG and eGFR-cystatin C, with no evidence of renal tubulopathy. Prevalence of clinically significant proteinuria (UPCR > 200 mg/g) and albuminuria (UACR ≥ 30 mg/g) decreased from 42% to 21% and 49% to 27%, respectively. Significant decreases in urine retinol binding protein to creatinine ratio, beta 2 microglobulin to creatinine ratio, and fractional excretion of uric acid were observed (p<0.001 for all). Hip and spine BMD percentage change from baseline to Week 24 was 0.74% (–0.71, 2.03) and 1.27% (–0.44, 3.83) (median, IQR), respectively.

**CONCLUSIONS:** These 24-week data support the virologic efficacy and renal and bone safety of once-daily single-tablet E/C/F/TAF for use in HIV+ patients with mild and moderate renal impairment (eGFR 30–69 mL/min). Switch to E/C/F/TAF was associated with no change in aGFR and with reductions in proteinuria.

## Clinical Sciences: Co-infections (including HCV, HBV, HPV, Syphilis, TB)

## Sciences cliniques : Coinfections (y compris VHC, VHB, papillomavirus, syphilis, tuberculose)

## CS20

### VIRAL LOAD AT TIME OF NEW SYPHILIS DIAGNOSIS AMONG HIV-POSITIVE MEN WHO HAVE SEX WITH MEN

**Burchell, Ann N; Tan, Darrell H; Allen, Vanessa G; Bayoumi, Ahmed M; Gardner, Sandra; Grewal, Ramandip; Kaul, Rupert; Mazzulli, Tony; McGee, Frank; Moravan, Veronika; Raboud, Janet; Rourke, Sean B; OHTN Cohort Study Team, For The Toronto, ON**

**BACKGROUND:** We previously reported high incidence (4.3 per 100 person-years) of new syphilis diagnoses among HIV-positive MSM. Syphilis may potentiate HIV transmission due to rises in viral load (VL), as is well documented among the ART-naïve. We aimed to quantify VL at time of syphilis diagnosis according to past VL and ART status.

**METHODS:** The OHTN Cohort Study is a multi-site clinical cohort of 6,408 people in HIV care across Ontario. Syphilis diagnoses and VLs were obtained via record linkage with databases at the Public Health Ontario Laboratory. We conducted a descriptive case-based analysis among MSM who experienced a new diagnosis of syphilis in 2006–2013 after follow-up for ≥12 months.

**RESULTS:** We analysed data from 193 new syphilis cases; the majority were gay (89%), white (73%), and in Toronto (87%). At time of syphilis diagnosis, mean age and CD4 cell count were 45 years and 500 cells/mm<sup>3</sup>, 33% had evidence of past syphilis, 88% were on ART for >1 year, and 10% were naïve. Ninety percent (173) had VL measurement within 90 days; of these, 78% had undetectable VL, 7% were <1000, and 15% were ≥1,000 copies/mL. Among men with detectable VL (≥50 copies/mL), 39% were ART-naïve or recent initiators, 79% had detectable VL 6–12 months ago, and, for men on ART, 57% reported ≥1 missed dose within 30 days. For men on ART with undetectable VL 6–12 months ago, only 5% had detectable VL at syphilis diagnosis

compared to 44% and 92% of men on ART whose VL was <1000 or ≥1000 copies/mL 6-12 months ago, respectively ( $P<0.0001$ ).

**CONCLUSIONS:** Among men on ART, plasma VL remained undetectable for the majority of new syphilis cases. Most with detectable VL were naïve, had previously unsuppressed VL, or were non-adherent. VL quantification in genital/rectal secretions is needed to fully establish whether modern suppressive ART limits HIV infectiousness even during syphilis co-infection.

## CS21

### LATENT TUBERCULOSIS INFECTION (LTBI) SCREENING AND FACTORS RELATED TO TUBERCULIN SKIN TESTING (TST) IN AN HIV OUTPATIENT CLINIC IN VANCOUVER, CANADA

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Vancouver, BC

**OBJECTIVE:** In British Columbia, screening for LTBI is recommended at baseline for HIV positive individuals. Screening includes risk factor and symptom identification, chest X-ray and TST in all patients with a CD4+ cell count >200 c/μL. We sought to determine factors associated with patients having at least one TST.

**METHOD:** We conducted a retrospective analysis of patient data from 2004-2014 at John Ruedy Immunodeficiency Clinic (IDC), a multidisciplinary HIV clinic. This data was linked to the BC Centre for Excellence in HIV/AIDS drug treatment database. We examined associations between having at least one TST using Pearson Chi-square Test and Wilcoxon rank-sum test. Multivariate logistical regression was used to determine factors related to TST screening.

**FINDINGS:** There were 2007 patients included, 1141 (56%) with at least one TST. Males and individuals with higher current CD4+ counts were more likely to have TST (Table 1). Multivariate analysis revealed TST increased with: >95% antiretroviral adherence (OR 1.82,  $p=0.014$ ), at least biannual visits (OR 1.06,  $p=0.003$ ) and hepatitis B vaccinated patients (OR 1.82,  $p<0.01$ ). Socioeconomic variables did not significantly impact TST screening: no injection drug use history (OR 1.4,  $p=0.11$ ) and downtown Eastside residence (OR 1.09,  $p=0.725$ ).

**CONCLUSIONS:** LTBI screening at IDC was suboptimal according to present guidelines. Individuals with better engagement evidenced by excellent antiretroviral adherence, higher current CD4+ count, regular clinical visits and hepatitis B vaccination are more likely to be screened for LTBI. Socioeconomic variables did not predict low screening rates.

| Variable                          | Never had TST (n=866)  | Ever had TST (n=1141)  | P value |
|-----------------------------------|------------------------|------------------------|---------|
| Male sex (%)                      | 42.3                   | 57.7                   | 0.05    |
| Age median (IQR)                  | 42.80 (34.89-49.42)    | 42.23 (35.13-49.49)    | 0.982   |
| Nadir CD4 c/μL median (IQR)       | 150.00 (50.00-280.00)  | 160.00 (70.00-290.00)  | 0.180   |
| Most recent CD4 c/μL median (IQR) | 440.00 (250.00-620.00) | 510.00 (350.00-690.00) | <0.001  |

## CS22

### THE HUMAN PAPILLOMAVIRUS SCREENING AND VACCINE EVALUATION (HPV-SAVE) STUDY TEAM: OPTIMIZING CARE FOR HIV-POSITIVE MEN WHO HAVE SEX WITH MEN (MSM)

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<sup>1</sup>Vancouver, BC; <sup>2</sup>Toronto; <sup>3</sup>Ottawa, ON; <sup>4</sup>Winnipeg, MB

**BACKGROUND:** HPV-associated anal cancers disproportionately impact HIV-positive MSM, with rates exceeding 100-fold those of the general population. Despite this, there are no established protocols for screening and treatment of anal cancer precursors, no universal coverage for HPV vaccine in males, and no rollout of organized screening pro-

grams. Further, there is growing epidemiologic evidence that HPV infection may enhance sexual transmission of HIV.

**DESCRIPTION:** In early 2014, the HPV-SAVE research team was formed, and received CIHR funding in late 2014. It consists of a multidisciplinary group of Canadian experts from biostatistics, community-based organizations, clinical care, epidemiology, laboratory medicine, and social sciences. Our assembled team developed a plan of research, knowledge translation, capacity building, and mentorship aimed at contributing to the evidence base of HPV care in MSM. Additionally, we partnered with clinics providing HIV care from which participant recruitment will occur, and will establish a community advisory board to help direct our mandate. **RESEARCH PRIORITIES:** We identified a number of knowledge gaps that translate into fundamental deficiencies in prevention and care of HPV-associated anal disease for HIV-positive MSM. The inter-related projects focus on: (1) Anal cancer screening and vaccination programs, including an examination of acceptability and barriers, and the validation of a triage algorithm using combination cytology and HPV testing; (2) a randomized controlled trial of anal dysplasia treatments, comparing different modalities to observation alone; and (3) elucidating the mucosal immune mechanisms that underpin the association of anal HPV infection with HIV transmission and susceptibility in MSM.

**FUTURE DIRECTIONS:** Our newly-funded CIHR team has initiated its five-year research program, with participant recruitment to start in late 2015. To our knowledge, this comprehensive HPV research program specifically focused on MSM is the first of its kind. With its broad-ranging objectives focusing on multiple facets of HPV management, it has the potential to significantly alter clinical practice and patient outcomes, as it attempts to answer key management questions for which there is a paucity of evidence.

## CS23

### BENEFIT OF DAA-BASED HCV THERAPY IN MONO-INFECTED VS. HIV CO-INFECTED INNER CITY POPULATIONS

Hsieh, Yu Li; Tossonian, Harout; Sharma, Shawn; Conway, Brian  
Vancouver, BC

**BACKGROUND:** With the availability of direct acting antiviral agents (DAAs), recent data have shown HCV therapies to be equally effective in the setting of HIV coinfection. However, this has not been fully evaluated in vulnerable inner city populations. Here we aimed to measure HCV treatment outcomes in mono-infected and HIV/HCV coinfecting cohorts treated with DAAs in this population.

**METHODS:** A retrospective observational study was conducted in patients treated with DAAs (Jun09–Jul14) or interferon (PR)-based regimens (Jan02–Jul14) at an inner city clinic in Vancouver. Data regarding HCV treatment, HIV coinfection status and lifestyle comorbidities were collected through chart review. The two-sample z-test was performed to compare the efficacy of DAA and PR-based regimens in mono- and HIV co-infected subpopulations, the treatment endpoint being a sustained virologic response (SVR) 12 weeks post treatment.

**RESULTS:** Among 372 treatment courses, 128 were completed with DAAs in 116 patients (97male), median age 53yrs, 87% genotype (GT)1, 66% treatment naïve, 13% compensated cirrhotic. Nineteen cases (15%) were HIV coinfecting. Other baseline conditions: 76% PWID, 58% ethanol abuse, 18% methadone maintenance therapy. Treatment outcomes included 65% SVR, 13% relapse and 6% premature discontinuation due to toxicity. Factors associated with SVR: treatment naïve to DAAs and PR ( $p=0.001$ ), pegINF- $\alpha$  free regimens ( $p=0.004$ ), baseline HCV RNA ≤106 IU/mL ( $p=0.04$ ), rapid virologic response ( $p<0.001$ ). The overall SVR rate attained with DAAs was significantly higher than the 55% with 244 PR courses ( $p=0.03$ ). There was no statistically significant difference in SVR rates between mono- and co-infected cohorts in PR or DAA-based regimens.

**CONCLUSIONS:** With equivalent response rates observed in mono- and co-infected cohorts, the advent of DAA-based therapies has improved SVR rates in all target inner city populations. Going forward, the availability of safer, simpler HCV treatment modalities will allow us to treat a greater number of individuals from our “core transmitter” populations.

## CS24

## SIGNIFICANT HEPATIC FIBROSIS IS COMMON AMONGST HIV/HCV CO-INFECTED PATIENTS UNDERGOING TRANSIENT ELASTOGRAPHY IN AN URBAN HIV/HCV CLINIC, VANCOUVER, CANADA

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Vancouver, BC

**BACKGROUND:** HIV/HCV co-infected individuals are at risk for faster progression of hepatic fibrosis. Large scale characterization of fibrosis stage in co-infected individuals is now possible through the use of non-invasive transient elastography (TE). The prevalence of significant fibrosis ( $\geq F2$ ) in co-infected patients undergoing care at an urban HIV/HCV program in Vancouver was evaluated.

**METHODS:** Fibrosis stage was assessed using TE in sequential HIV/HCV co-infected individuals referred between October 2013 and December 2014. Fibroscan was performed following recommended 4 hour fast. Prevalence of moderate fibrosis (F2) and cirrhosis (F4) was determined. Factors associated with F4 fibrosis were assessed using multivariate logistic regression models adjusted for age, gender, duration of HIV and HCV, CD4 nadir, prior AIDS illness, and use of alcohol.

**RESULTS:** Overall 144 individuals (82% male) underwent TE. The median age was 51 years (interquartile range [IQR] 46 – 57 years), 60% reported history of injection drug use and 94% received ART at time of TE with median pVL < 40 c/mL. The median duration of HIV infection and HCV infection was 14 years (IQR 8 – 18) and 18 years (IQR 3 – 18) respectively. Overall the prevalence of F2 fibrosis was 10%, F3 fibrosis was 12% and 22% of individuals were found to have F4 fibrosis. Factors associated with F4 fibrosis included duration of HCV infection (adjusted odds ratio [aOR] 1.08; 95% CI 1.02 – 1.15), and prior history of AIDS defining-illness (aOR 3.08; 95% CI 1.05 – 8.59).

**CONCLUSIONS:** Significant fibrosis ( $\geq F2$ ) was common in 44% of individuals undergoing TE in an HIV/HCV clinic. Cirrhosis was associated with longer duration of HCV and prior advanced HIV with history of prior AIDS illness. Although referral bias must be considered, strategies to improve access to HCV therapy must be evaluated to prevent future end-stage liver disease.

## CS25

## REAL-LIFE EFFECTIVENESS OF PEGINTERFERON ALPHA 2B PLUS RIBAVIRIN IN A CANADIAN COHORT OF TREATMENT-NAÏVE CHRONIC HEPATITIS C PATIENTS WITH GENOTYPE 2 AND GENOTYPE 3: RESULTS FROM THE POWER AND REDIPEN STUDIES

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<sup>10</sup>Kirkland, QC

**OBJECTIVE:** We assessed the real-life effectiveness of pegylated interferon (peg-IFN)  $\alpha$ -2b combined with ribavirin in a cohort of treatment-naïve patients with chronic genotype 2 (G2) or genotype 3 (G3) hepatitis C virus (HCV) infection, followed in Canadian routine clinical care, and identified indicators predicting sustained virologic response (SVR).

**METHODS:** Post-hoc pooled analysis of two Canadian open-label, multi-center, observational studies, RediPEN and PoWer. A total of 1242 patients infected with G2 (n=468) and G3 (n=774) were included. The primary outcome was SVR. The secondary endpoints included early virologic response (EVR), end-of-treatment (EOT) response, and relapse. Multivariate logistic regression was used to identify independent predictors of treatment response among potential variables identified in univariate analyses.

**RESULTS:** The EVR rate in G2 and G3 infected patients was 18.2% and 16.9%, respectively. SVR in G2 and G3 was 74.4% and 63.6%. SVR for F0/F1, F2, F3 and F4 was 76.4%, 74.1%, 69.4% and 78.9% for G2 and 73.1%, 52.6%, 66% and 41.1% for G3. Relapse occurred in 12.7% and 19.1% of G2 and G3 infected patients achieving EOT response. Overall,

G3 was found to be an independent predictor of reduced SVR (OR=0.196; P=0.007) and increased relapse (OR=6.841; P=0.022). Among G3 infected patients, increasing fibrosis score was the most important factor predicting reduced SVR [F2 vs. F0/F1 (OR: 0.409; P=0.009); F3 vs. F0/F1 (OR: 0.716; P=0.338); F4 vs. F0/F1 (OR: 0.265; P=0.001)]. Male gender (OR: 0.076; P=0.020) and higher fibrosis score [F2 vs. F0/F1 (OR: 9.718; P=0.016); F3/F4 vs. F0/F1 (OR: 4.234; P= 0.1130)] were associated with increased relapse rate in G3 patients. No predictors of response were identified in G2 infected patients.

**CONCLUSIONS:** The results of this Canadian cohort analysis support the real-life effectiveness of peg-IFN  $\alpha$ -2b plus ribavirin in HCV G2 and G3 infected patients which were comparable to the established clinical efficacy profile. Overall, genotype was identified as the most significant predictor of treatment outcome. Fibrosis score and gender were key predictors of outcome in the G3 infected population.

## CS26

## EVALUATION OF MICROBEAD ARRAY ASSAYS FOR THE MEASUREMENT OF INFLUENZA ANTIBODY LEVELS IN HIV INFECTED ADULTS

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<sup>1</sup>Ottawa, ON; <sup>2</sup>Vancouver, BC; <sup>3</sup>Winnipeg, MB

**INTRODUCTION:** A clinical trial of adjuvanted influenza vaccine dosing strategies in HIV+ adults assessed immunogenicity by hemagglutination inhibition (HAI) assay. We subsequently evaluated a newly developed microbead array (BA) assay in this sub-study. The performance of both assays was compared.

**METHODS:** A phase III, randomized, multi-centered, controlled, vaccine trial was conducted at 4 CTN sites. Two dosing strategies (standard dose vs standard dose plus day 21 booster) were assessed in 150 HIV+ adults during the H1N1 (2009) pandemic. A single antigen, inactivated split adjuvanted (AS03(A)) influenza vaccine (Arepanrix) was used. Immunogenicity was measured at baseline, days 21 and 42.

**RESULTS:** The sub-study population was similar between groups and to those in the original study: 83% male, 77% on ART, median CD4=567 cells/mm<sup>3</sup>, 83% with HIV RNA < 50 copies/mL. Baseline BA medians (IQR) were 1983 Mean Fluorescence Intensity (MFI) (238-7970) and 1362 (24-4670) for the 1 dose and 2 dose groups. HAI seroprotection results were 66% and 76% at visit 2 and 68% and 89% at visit 3 for the two groups. Using a BA seroreactivity cut-off of 500, results were 75% and 59% at visit 2 and 78% and 61% at visit 3 for the two groups. The raw agreement between HAI and BA tests was 59% at visit 2 and 57% at visit 3. Using a BA cut-off of 1000, results were identical at both visits, with the exception of the 1 dose group at visit 3, which fell to 70% seroreactive. Visit 3 raw agreement remained at 57%. There were no strong relationships between BA values and key baseline variables.

**CONCLUSION:** The BA assay does not appear to be an effective indicator of seroprotection in HIV+ adjuvanted vaccine recipients. The lack of agreement with the HAI results suggests poor assay utility.

## Clinical Sciences: Opportunistic Infections and Malignancies

## Sciences cliniques : Infections opportunistes et pathologies malignes

## CS27

## IMATINIB (GLEEVEC) AS A FINAL BLOW TO RECURRENT KAPOSI SARCOMA IN A PATIENT WITH LONG-TERM HIV CONTROL : A CASE REPORT AND LITERATURE REVIEW

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Montreal, QC

**INTRODUCTION:** Kaposi sarcoma (KS) is a vascular tumor caused by oncogenic human herpesvirus 8 (HHV-8) that often occurs with HIV-associated immunosuppression. Receptor tyrosine kinases such as c-kit



and PDGFR have a role in pathogenesis of KS. Imatinib, a tyrosine kinase inhibitor, has resulted in partial regression of KS lesions in one-third of patients. Herein, we reported a case of a Caucasian male with recurrent KS despite well suppressed HIV infection, who received the imatinib therapy and showed clinically relevant tumor response.

**CASE DESCRIPTION:** A 38-year-old male presented with a notable history of HIV infection since 2005 whereupon he began antiretroviral therapy. Patient remained undetectable with a CD4 count  $>500$  cells/uL, when he developed cutaneous nodular KS on lower limbs in 2008. He was treated with multiple cycles of liposomal doxorubicine, paclitaxel and bortezomib, and failed to sustain response for more than 6 months post chemotherapy. In 2013, when referred to our centre patient developed left lower limb tumoral KS aggravated by prominent pain and swelling. He received 8 cycles of paclitaxel with the mTOR Inhibitor sirolimus for 1 year with transient and partial tumor control. Due to clinical failure, oral imatinib 400mg daily with liposomal doxorubicine was administered. Patient tolerated the treatments well and major regression of lesions occurred. Chemotherapy was withheld after 2 cycles as his symptoms continued to improve on imatinib monotherapy, with nearly all KS lesions resolved at last visit.

**CONCLUSIONS:** Imatinib has activity in AIDS-KS, which makes it a promising treatment especially in refractory or recurrent cases. To our knowledge, this is the first ever reported case on the value of imatinib in control of KS in the context of long-lasting virological control with adequate quantitative CD4 recovery. KS occurrence despite apparently successful immune reconstitution warrants renewed investigation into what constitutes a true functional immune restoration.

## Clinical Sciences: Early Treatment, Reservoirs, and Cure

## Sciences cliniques : Traitement anticipé, réservoirs et remède

### CS29

#### SOCIO-DEMOGRAPHIC CHARACTERISTICS IN PARTICIPANTS OF MONTREAL PRIMARY HIV INFECTION: IMPLICATIONS FOR PREVENTION AND EARLY ART INTERVENTION

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**INTRODUCTION:** Primary HIV-1 infection (PHI) has been regarded as a window of opportunity for strategies of prevention and early intervention. Understanding of the distinctive socio-demographic and virological/immunological characteristics of these patients will contribute to a rational management of primary infection and secondary transmission.

**METHODS:** A prospective cohort of PHI has been established in Montreal in both private medical centres (PCs) and hospital-based centres (HCs). From May 1996 to Feb 2014, 326 PHI participants  $<6$  month of infection were selected, with 166 from PCs and 160 from HCs. Socio-demographic and virological as well as immunological profiles between the two groups were compared.

**RESULTS:** Routes of infection differed significantly between participants recruited in different medical centres, with MSM accounting for 93.4% in PC participants v.s. 62.5% in HC participants, and IDU accounting for 4.2% in PC participants v.s. 22.5% in HC participants ( $p<0.001$ ). Participants from PCs had a higher proportion of education beyond college/university levels ( $p<0.001$ ) and a higher annual income ( $p<0.001$ ) compared with those from HCs. Numbers of sexual partners in the last 6 months before enrollment were similar for MSMs in both PCs and HCs. However, in both PCs and HCs, MSMs with less education and lower income tended to have more sexual partners ( $p<0.05$ ). No difference was observed in baseline HIV viral load or CD4<sup>+</sup> T cell counts between the two groups.

**CONCLUSIONS:** Patients who participated in the Montreal PHI cohort differ in their socio-economic status and sexual behaviors, which needs to be considered in the implementation of early interventions, surveillance as well as prevention of secondary transmissions.

### CS30

#### DEVELOPMENT OF A LATENCY REVERSING ACTIVATOR VACCINE (ACT-VEC) PLATFORM FOR HIV-1 CURE THERAPY

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The ability of HIV-1 to establish and persist within cellular reservoirs as a transcriptionally silent provirus represents a substantial roadblock to cure research. Therapeutic interventions designed to eliminate this hidden reservoir have thus far failed, and may require bold and innovative strategies. We have designed an activator vaccine (ACT-VEC), based on autologous derived VLPs, which can specifically target the resting CD4 T cell reservoir, and induce latency reversal. Here we describe the safeguards we have implemented into our 2nd generation VLPs to render the vaccine formulations safe for future in vivo, pre-clinical testing as well as preliminary results from our in vitro latency reversal studies.

We have successfully created autologous ACT-VEC VLP constructs for all HIV-1 infected recruits. We report that our 2nd generation ACT-VEC VLPs have reduced packaging of genomic HIV-1 RNA (up to 221-fold), increasing its safety profile. This along with the PCR-generated AAH>RRK mutation in Integrase and deleted 5' LTR renders our ACT-VEC incapable of reverse transcription, integration, or packaging of its RNA. Preliminary studies show that ACT-VEC share considerable genetic similarity to virus derived from patients. Of note, autologous ACT-VEC were able to stimulate the generation of 20 to 30-fold more HIV RNA from infected T cells than Flu/Tet/CMV stimulation and more than NL4-3 ACT-VEC control. Critically, our studies revealed ACT-VEC to outperform a number of clinically relevant latency reversal agents such as Romidepsin and Vorinostat as well as the T cell mitogen PHA.

Here we clearly demonstrate that our 2nd generation ACT-VEC formulations represent a safe vaccine platform for use as a therapeutic intervention and that ACT-VEC formulation may signify a promising strategy to purge the latent viral reservoir and facilitate cure.

## Clinical Sciences: Mental Health Issues for HIV Positive Persons

## Sciences cliniques : Questions de santé mentale pour les personnes séropositives au VIH

### CS31

#### DO PERSONALITY TYPES INFLUENCE THE SELF-EVALUATION OF NEUROCOGNITIVE FUNCTION?

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**INTRODUCTION:** Individuals living and aging with HIV may experience cognitive impairments in speed of processing, attention and memory performance. Our previous work has shown that subjective cognitive complaints may be overestimated relative to actual neurocognitive deficits when depression is present. To understand these relationships better, we investigated the role of personality style in the reporting of subjective cognitive complaints.

**METHODS:** 141 male participants from an ongoing study of HIV Associated Neurocognitive Disorders (HAND) at St. Michael's Hospital completed an extensive neuropsychological evaluation, the NEO personality inventory, Beck Depression Inventory, and the Patient's Assessment of Own Functioning to measure cognitive complaints. Profile analysis was used to visualize relationships between the five NEO personality dimen-

sions and cognitive complaints scores, and then we selected two NEO scales of interest, neuroticism and extraversion for further analysis. Multi-level regression was performed in steps to explore how neuropsychological, demographics (age / education), HIV status (plasma viral load, nadir and recent CD4), depression and personality dimensions contribute to subjective cognitive complaints.

**RESULTS:** In the 4-level model, higher neuropsychological impairment ( $p<0.001$ ) and neuroticism ( $p<0.05$ ) significantly predicted higher cognitive complaints, while higher extraversion was negatively associated with complaints ( $p<0.05$ ). However, inclusion of depression in the model ( $p<0.01$ ) diminished the effect size of neuroticism and extraversion such that they were no longer significant. Testing for collinearity revealed a strong, positive correlation between NEO neuroticism score and depression ( $r=0.504$ ,  $p<0.01$ ) and moderate negative correlation ( $r=-0.384$ ,  $p<0.01$ ) between NEO extraversion score and depression.

**CONCLUSIONS:** Individuals with a high neuroticism style may report higher cognitive complaints. However, the presence of depression appears to be a more robust predictor of cognitive complaints and is recommended to be included in an assessment of the etiology of cognitive complaints in HIV and HAND.

## Clinical Sciences: HIV and Aging – Including CVD, Osteoporosis, Neurocognitive Effects

### Sciences cliniques : VIH et vieillissement, y compris les maladies cardiovasculaires, l'ostéoporose et les effets neurocognitifs

#### CS32

##### PRELIMINARY DATA FROM THE BRAIN HEALTH IN HIV NOW COHORT

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**BACKGROUND:** The experience of living with chronic HIV infection can threaten brain health, whether through direct effects of the infection or its treatment on the brain, or by affecting stress levels, coping skills, physical health, and social supports. Although the burden of poor brain health in HIV in Canada is unknown, it is likely to be high. The Brain Health Now project is a multi-site Canadian study using a cohort multiple randomised controlled trial design to meet goals of identifying, understanding and optimizing brain health in people living with HIV.

**METHODS:** A cohort of 900 people HIV+ is being fully characterized for health-related quality of life with a specific focus on determinants of cognitive and emotional health and followed longitudinally to establish how brain health changes over time. Five interventions targeting cognitive ability through cognitive training, exercise, self-management and treatments for insomnia and depression will also be tested in sub-cohorts drawn from the main study.

**RESULTS:** Data from the first 123 people recruited from Montreal (85% men; mean age 53) indicated that most health aspects of quality of life were considerably below populations norms. In particular, 50% would be classified as at risk for clinical depression and 36% had low cognitive ability making them eligible for interventions. In addition, 30% are eligible for the insomnia intervention, 22% were sedentary and are eligible for an exercise intervention, and all are eligible for self-management. Overall, 40% expressed some degree of dissatisfaction with life, in comparison to only 10% for other Canadians.

**CONCLUSION:** This novel methodology combining observational and interventional approaches is an efficient and attractive way of conducting research on vulnerable populations.

#### CS33

##### DETECTING NEUROCOGNITIVE IMPAIRMENT WITH GLOBAL DEFICIT SCORE

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Diagnosis of HIV-associated Neurocognitive Disorder (HAND) typically requires a neurocognitive assessment and interview by a trained clinician. This clinical determination of impairment is considered the “gold standard” for detecting neurocognitive impairment, however, it tends to be time-consuming, requires expertise, and has potential for subjectivity. An alternative, quantitative approach involves calculating a global deficit score (GDS) based on an algorithm that summarizes the number and severity of impairments using only neurocognitive test results. While this method may fail to account for important confounds or contextual details, comparing the results of clinical diagnosis and data-derived GDS can help to inform the clinical picture of HAND. Because GDS is used in HAND research as a quantitative measure of impairment, evaluating its concordance with clinical diagnosis would serve to validate the use of this measure, and could highlight potential caveats.

117 HIV+ patients were evaluated as part of an ongoing HAND research program at St. Michael's Hospital in Toronto, Canada between 2009-2014. Patients were diagnosed as normal or impaired by a neuropsychologist using the gold standard clinical approach. GDS was calculated from the average of converted neuropsychological test T-scores, with cutoff for impairment set at  $GDS \geq 0.5$ . We observed 81.2% concordance between clinically diagnosed impairment and GDS-determined impairment, 82.8% sensitivity and 79.2% specificity.

Compared to the dually-impaired group, those found to be GDS-only impaired had significantly lower age ( $p=0.006$ ), lower subjective cognitive complaints ( $p=0.002$ ), and lower depression scores on the Beck Depression Inventory ( $p=0.011$ ). Conversely, those found to be impaired only clinically had significantly higher scores on subjective cognitive complaints ( $p=0.004$ ).

Overall, GDS appears to be a good proxy for determining impairment among HIV+ individuals. However, younger individuals, those with fewer cognitive complaints and depressive symptoms may have greater likelihood of scoring a false-positive for impairment; likewise, individuals with fewer or less severe neuropsychological deficits and higher cognitive complaints may be missed by GDS despite positive diagnosis of HAND by a clinician. These factors should be considered when using GDS to determine impairment status.

#### CS34

##### VALIDITY OF FOUR NEUROCOGNITIVE SCREENING TESTS FOR HIV-ASSOCIATED NEUROCOGNITIVE DISORDERS (HAND): PRELIMINARY RESULTS OF SENSITIVITY, SPECIFICITY, AND CLASSIFICATION ACCURACY

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<sup>4</sup>Sydney, NSW, Australia

**OBJECTIVE:** HIV-associated neurocognitive disorders (HAND) remain prevalent despite the availability of cART. Several reviews, including our own, have shown that most cognitive screening instruments are useful for more severe forms of HAND but less so for the milder forms, although there are numerous methodological issues that need to be addressed. Our CIHR-funded study assessed these issues, and the relative and concurrent validity of four screening tests for HAND against the gold standard for HAND diagnosis.

**METHODS:** 104 adults (mean age: 51 years; 86% men) completed four screening tests: Cogstate Brief Battery (Cogstate), HIV Dementia Scale (HDS), Computer Assessment of Memory and Cognitive Impairment (CAMCI), Montreal Cognitive Assessment (MoCA), and comprehensive neuropsychological battery assessing processing speed, attention/working memory, learning/memory, and executive functions. HAND clinical diagnosis was made by a Neuropsychologist who was blind to results of screening tests. Results from screening tests were compared

with clinical HAND diagnosis using Receiving Operator Characteristics (ROC) analysis; area under the ROC curve (AUC) was calculated to determine classification accuracy rates of the screening tests.

**RESULTS:** HAND was diagnosed in 60 participants (58%). Compared to clinical diagnosis, sensitivity [95% CI] estimates of screening tests were: adjusted HDS, 90% [80%-96%]; MoCA, 68% [55%-80%]; Cogstate, 67% [53%-78%]; and CAMCI, 27% [16%-40%]. Specificity estimates were: CAMCI, 100% [92%-100%], MoCA, 86% [73%-95%]; Cogstate, 80% [65%-90%]; and HDS, 36% [22%-52%]. AUC estimates indicated the MoCA test had the best accuracy (AUC=0.774), followed by Cogstate (AUC=0.731), CAMCI (AUC=0.633), and adjusted HDS (AUC=0.632). Combination of any two screening tests (test positive by either one or both tests) resulted in classification accuracy improvements (AUC ranges: 0.623-0.815).

**CONCLUSION:** Our preliminary results suggest that the MoCA and Cogstate screening tests have moderate classification accuracy for HAND in people living with HIV. Further work is underway to determine the clinical utility and generalizability of these findings.

### CS35

#### PREDICTORS OF NEUROCOGNITIVE DECLINE AMONG AVIREMIC INDIVIDUALS IN THE CHARTER COHORT

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**BACKGROUND:** Limited information is available on the predictors of neurocognitive decline in individuals with good virological control. Identification of modifiable risk factors that predict decline would support the development of targeted interventions aimed at minimizing neurocognitive decline in higher-risk individuals. The objective of this study was to identify baseline factors predicting decline over the subsequent 3 years in aviremic HIV+ individuals.

**METHODS:** HIV+ individuals in the CNS HIV Anti-Retroviral Therapy Effects Research (CHARTER) study were assessed with 15 neuropsychological tests every 6 months. Patterns of neurocognitive change on each test were detected using group-based trajectory analysis. Deterioration in performance  $\geq 0.5$  standard deviation on 1 or more tests was considered neurocognitive decline. Multiple logistic regression was used to identify baseline sociodemographic and clinical characteristics predicting neurocognitive decline in aviremic patients.

**RESULTS:** Among 191 HIV+ patients who were aviremic throughout the first 3 years, 23 (12%) experienced neurocognitive decline during this period. Results from multiple logistic regression indicated predictors of decline were: low eGFR (OR: 6.80, 95% CI: 1.25, 34.23); low education (OR: 4.25, 95% CI: 1.45, 12.43); prolonged duration of HIV infection (OR: 5.45, 95% CI: 1.19, 25.02); and increased CSF protein levels (OR: 3.25, 95% CI: 1.13, 9.35). Several factors associated with cognitive impairment in cross-sectional studies (e.g. older age, low nadir CD4, CPE score, hepatitis C co-infection, diabetes, hypertension, smoking, obesity) did not reach statistical significance in this group.

**CONCLUSIONS:** Neurocognitive decline over 3 years was uncommon in this sample of aviremic HIV+ individuals. Results on eGFR, a known independent predictor of atherosclerotic vascular disease, suggest targeting additional cardiovascular risk factors could be a useful strategy for minimizing risk of neurocognitive decline. Potential interventions such as smoking cessation or obesity management could be applicable for up to 80% of the participants.

### CS36

#### DIFFERENCES IN BONE MICROSTRUCTURE AMONG HIV-INFECTED ADULTS WITH AND WITHOUT FRACTURE

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**BACKGROUND:** High-resolution peripheral quantitative computed tomography (HR-pQCT) is a novel, non-invasive technology that measures cortical and trabecular bone microarchitecture and volumetric bone mineral density (vBMD). Emerging data suggests HIV-infected individuals have differences in HR-pQCT parameters compared to uninfected

controls. No prior study has compared HR-pQCT outcomes between HIV-infected persons with and without fracture.

**METHODS:** Adults with a history of low-trauma fracture after HIV diagnosis (cases) were matched 1:1 with HIV-infected adults without prior fracture (controls) based on age, sex, race and smoking history. Participants underwent HR-pQCT at the distal radius and tibia, and dual energy X-ray absorptiometry (DXA) at the hip and lumbar spine. Parameters were compared between cases and controls using paired t-tests, with differences expressed as percentages of control group values.

**RESULTS:** 23 matched pairs were included, with median (IQR) age 50 (46,56) years, 78% male, 78% white and 57% smokers. Median (IQR) duration of HIV was 19 (11,23) years for cases and 10 (7,18) years for controls. On DXA, case patients had significantly lower areal BMD at the hip (median difference = -4.3%,  $p=0.04$ ), but not the lumbar spine (-3.47%,  $p=0.33$ ). On HR-pQCT there was a trend towards lower total volumetric BMD at the tibia (-11.1%,  $p=0.10$ ) but not the radius (-0.09%,  $p=0.80$ ). Numerical differences were observed in cortical and trabecular parameters, with differences more pronounced at the tibia than radius. At the radius, the largest percentage differences were in cortical porosity (+13.4%,  $p=0.78$ ), axial failure load (-10.0%,  $p=0.23$ ), trabecular bone volume fracture (-6.03%,  $p=0.65$ ) and trabecular vBMD (-5.83%,  $p=0.64$ ). At the tibia, the largest percentage differences were in cortical thickness (-14.6%,  $p=0.06$ ), tvBMD (as above), axial failure load (-10.4%,  $p=0.06$ ) and ultimate stress (-10.2%,  $p=0.08$ ).

**CONCLUSIONS:** Low-trauma fracture appears to be associated with differences in cortical and trabecular bone microarchitecture in HIV-infected adults. The association requires further study.

### CS37

#### COPD SYMPTOM AND DISEASE SCREENING IN AN HIV POPULATION

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**BACKGROUND:** HIV-positive individuals represent a population that is at a higher risk of developing chronic obstructive pulmonary disease (COPD). In this study, we sought to determine the effects of smoking on respiratory symptoms and smoking related diseases among HIV-positive patients and to determine if symptomatic patients are being appropriately screened for COPD.

**METHODS:** HIV-positive individuals were asked to complete a self-administered questionnaire regarding respiratory symptoms and diseases. The effects of smoking on respiratory symptoms and diseases were reported as estimates of odds ratio. The screening criteria used to determine at risk patients for COPD were adapted from the Canadian Thoracic Society (CTS) guidelines.

**RESULTS:** A total of 247 patients were recruited. The median age was 49 years; 75% were male and 92% were currently on combination anti-retroviral therapy. Current and former smokers represented 66% of the population. Smoking had a statistically significant effect on respiratory symptoms including wheeze (OR 4.8 [95% CI 1.6-14.2]), phlegm production (OR 4.9 [95% CI 2.2-10.5]), current cough (OR 7.0 [95% CI 3.0-16.2]), chronic cough  $\geq 3$  months (OR 5.2 [95% CI 2.3-11.8]) and dyspnea (OR 7.2 [95% CI 1.7-31.2]). Smoking also had a statistically significant effect on respiratory diseases including COPD (OR 4.9 [95% CI 1.1-21.9]), bronchitis (OR 3.8 [95% CI 1.9-7.7]), asthma (OR 6.0 [95% CI 2.0-17.7]) and pneumonia (OR 2.1 [95% CI 1.2-4.0]). Among HIV-positive smokers, 40% met the CTS criteria for COPD screening, while only 12% of smokers self-reported a diagnosis of COPD and 9% reported use of inhaled puffers.

**CONCLUSIONS:** The burden of smoking in the HIV population is significant. HIV-positive smokers are more likely to report both respiratory symptoms and diseases than HIV-positive non-smokers. A discrepancy exists between patients who meet the CTS COPD screening guidelines and those who have been diagnosed with COPD, raising the concern for under-recognition and under-diagnosis of COPD in the HIV-positive population.



## Clinical Sciences: HIV in Women and in Pregnancy

### Sciences cliniques : Le VIH chez les femmes et pendant la grossesse

#### CS39

##### ADVERSE BIRTH OUTCOMES AND HEPATIC STEATOSIS IN PREGNANT MICE ADMINISTERED THE INTEGRASE STRAND TRANSFER INHIBITOR RALTEGRAVIR

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**BACKGROUND:** There is increasing evidence to support an association between antiretroviral exposure during pregnancy and adverse birth outcomes including, preterm birth and small birth weight. Raltegravir was the first integrase strand transfer inhibitor to be used for the treatment of HIV and is most commonly used when patients develop resistance to other drugs. The main objective of this study is to investigate the effects of raltegravir on birth outcomes and liver toxicity in a mouse model.

**METHODS:** Pregnant mice were exposed to either water or human equivalent doses of lopinavir or raltegravir (in combination with the NRTI backbone Combivir) during the pre-implantation period (gestational day 1-5.5) and post-implantation period (gestational day 6-13.5). At day 5.5 and 13.5 mice were sacrificed and serum and tissue samples were collected for further analysis. Birth outcomes, including number of pregnant mice, number of fetuses, fetal viability, and fetal and placental weight were recorded. Livers were embedded in paraffin, sectioned and stained with hematoxylin and eosin.

**RESULTS:** There was no difference in birth outcomes or liver toxicity with pre-implantation drug exposure. Mice exposed to either lopinavir or raltegravir during the post-implantation period had a significant increase in non-viable pups per litter and resorption levels compared with controls. Exposure to only raltegravir during the post-implantation period resulted in significantly lower fetal and placental weights. Finally, raltegravir but not lopinavir increased the lipid content in the liver of mice exposed post-implantation.

**CONCLUSIONS:** Results from these studies suggest that exposure to raltegravir in pregnant mice during the post-implantation period results in lower fetal viability, higher resorption levels, significantly decreased fetal and placental weight, as well as an increase in lipid accumulation in the liver. Further experiments will help identify the specific pathways that lead to these adverse effects during pregnancy.

#### CS40

##### PSYCHOLOGICAL DISTRESS AND BARRIERS TO HEALTH CARE AMONG MOTHERS LIVING WITH HIV (MLHIV)

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**INTRODUCTION:** Health-care providers play a major role in providing good quality care and in preventing psychological distress among women living with HIV (WLHIV). WLHIV face distinct reproductive concerns regarding fertility and parenthood that may not be adequately addressed by care providers. The objectives of this study are to explore the impact of health-care services and satisfaction with care providers on psychological distress in mothers living with HIV (MLHIV).

**METHODS:** One hundred MLHIV were recruited from community and clinical settings in the province of Quebec (Canada). Participants were aged 40.8 years old on average, were diagnosed with HIV for a mean time of 11.5 years and reported a median number of two dependent children or grandchildren (range 1-5). Variables included sociodemographic and control variables, psychological distress, resilience, number of HIV care providers, quality of communication and satisfaction with care providers, barriers to care and HIV stigma. Prevalence estimation of clinical psycho-

logical distress and univariate and multivariable logistic regression models were performed to predict clinical psychological distress.

**RESULTS:** Forty-five percent of the participants reported clinical psychological distress. In the multivariable regression, the following variables were significantly associated with psychological distress while controlling for sociodemographic variables: resilience, quality of communication with the care providers, resources, and HIV disclosure concerns.

**DISCUSSION:** The multivariate results support the key role of personal, structural, and medical resources in understanding psychological distress among MLHIV. The findings show the importance of paying special attention to mothers with dependent children, as they face unique challenges regarding their family's needs. By inquiring about the overall quality of life of their patients, care providers would learn more about their needs and be better able to direct them to the relevant resources.

#### CS41

##### E-WHEALTH INTERVENTION: SUPPORTING HIV-POSITIVE WOMEN IN WAYS THAT WORK

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HIV stigma may be the most significant challenge for HIV-positive women and is associated with decreased self-esteem, hopelessness and increased psychological distress. HIV services were not originally created by or for women, therefore, women's unique needs have not been considered in program design. Furthermore, HIV-positive women may be prevented from accessing services because they fear public disclosure of their HIV status or because of financial and logistical barriers including transportation, employment and childcare. The Women's HIV Empowerment And Life Tools For Health (wHEALTH) Intervention was developed to respond to these barriers based on a Peer Case Management (PCM) approach, whereby a PCM works in partnership with the woman in an informal setting to assess different areas of daily living, housing, finances, social supports, education/training opportunities, health, leisure or meaningful activity, and coordinate essential health and social services. Women receiving this intervention experienced increased mental health-related quality of life, increased perceived social support, decreased symptoms of depression, and increased awareness of and access to community-based supports. The relationship between the woman and the PCM was a mutually empowering experience, facilitating a unique level of sharing. Normally, the support HIV-positive women receive in a group format results in anxiety about the potential for a breach of confidentiality. The introduction of internet-based platforms allows participation from home, thereby improving both convenience and privacy. However, there is limited research on web-based interventions in real time focusing on women living with HIV. The e-wHEALTH study will evaluate the applicability of the wHEALTH Intervention in a web-based format, facilitated through a videoconferencing platform, and compare its effectiveness to the face-to-face design, in order to extend support to women living in rural/remote areas and to those not ready to meet face-to-face.

#### CS42

##### EVALUATION OF ADHERENCE TO REGIONAL GUIDELINES TO PREVENT PERINATAL TRANSMISSION

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**OBJECTIVE:** To describe adherence to regional guidelines to prevent perinatal transmission in northern Alberta by analyzing antiretroviral therapy (ART) and mode of delivery in pregnant women and their infants.

**METHODS:** Retrospective chart review of a cohort of HIV-infected pregnant women who delivered in our region March 2006 through October 2013. **RESULTS:** 121 women had 141 pregnancies resulting in 146 live born infants (5 sets of twins). 31 women (25.6%) were first diagnosed with HIV during pregnancy; 2 (1.7%) were diagnosed at delivery. Of the 141 pregnancies, treatment with ART was administered prior to delivery in 134 (95%). The maternal viral load (VL) closest to delivery

was <200 copies/mL in 119 pregnancies (84%), 200-1000 copies/mL in 8 (6%) and > 1000 copies/mL in 14 (10%). Standard protocol of intravenous (IV) zidovudine during delivery was administered in 128 (91%); in 12 out of the 13 other cases IV zidovudine was not given maternal VL near delivery was < 400 copies/mL. All women with VL > 1000 copies/mL near delivery had a cesarean section except two where the previous VL was undetectable. All infants received oral zidovudine and 18 infants (12%) were initiated on 3 antiretroviral drugs due to high/unknown maternal VL near delivery. Two infants whose mothers had a VL > 1000 copies/mL did not receive triple therapy but in both cases maternal VL was < 2000 copies/mL. The single confirmed HIV-infected infant was born to a woman who was non-adherent to ART with a VL near delivery >50 000 copies/mL; she received IV zidovudine and delivered by emergency cesarean section and the infant received 3 antiretroviral drugs for 6 weeks.

**CONCLUSIONS:** Overall adherence to regional perinatal guidelines was excellent and perinatal transmission was low. This is likely due to efforts of a multidisciplinary team coordinating care for mother-infant pairs.

### CS43

#### SOCIO-DEMOGRAPHIC AND CLINICAL PREDICTORS OF PRETERM BIRTHS AND LOW INFANT BIRTH WEIGHT AMONG WOMEN LIVING WITH HIV IN ONTARIO, CANADA

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**BACKGROUND:** The frequency of pregnancies among mothers living with HIV is increasing as a result of recent advances in combination antiretroviral therapy and the increasing proportion of women living with HIV (WLWH) of childbearing age. WLWH are also at increased risk of adverse obstetric outcomes. This study examines socio-demographic and clinical characteristics as correlates of infant prematurity and low birth weight.

**METHODS:** The HIV Mothering Study is a longitudinal study of mothers living with HIV. Data during the 3rd trimester of pregnancy and at 3 months postpartum was obtained through surveys, medical records, and narrative interviews. Stepwise logistic regression was used to create final multivariate models; for each of the two outcomes, covariates with *p*-values ≤ 0.20 were included, then a backward elimination of covariates was performed until a best-fit model was reached.

**FINDINGS:** Of the seventy-seven women enrolled, eight deliveries were preterm and eleven were at low birth weight. Univariate logistic regression established that the best predictors of preterm birth were marital status (OR=2.05; *p*=0.080), education (OR=7.00; *p*=0.076), CD4 count (OR=4.91; *p*=0.014), viral load (OR=3.11; *p*=0.157), cardiovascular disease (OR=0.132; *p*=0.019), and immigration status (OR=4.68; *p*=0.127). Eligible correlates of low birth weight were race (OR=0.713; *p*=0.174), gestation at which ARV was started (OR=0.951; *p*=0.200), and depression (OR=0.202; *p*=0.020). Stepwise regression determined that the most significant predictors of preterm birth were CD4 count (OR=0.100; *p*=0.007); and cardiovascular disease (OR= 49.5; *p*=0.006); while low birth weight was significantly associated with past medical history of depression (OR=5.27; *p*=0.018).

**CONCLUSION:** Pregnant mothers with low CD4 counts, history of cardiovascular disease, and depression are at increased risk of adverse obstetric outcomes. To improve health trajectories for both mother and child, specific strategies to address clinical and emotional risk factors of the mother should be adopted prior to delivery.

### CS44

#### IMPACT OF COMBINATION ANTIRETROVIRAL THERAPY (cART) ON PLACENTAL ANGIOGENESIS AND PREGNANCY OUTCOME

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**BACKGROUND:** cART is recommended during pregnancy to prevent HIV vertical transmission. However, cART has been associated with adverse birth outcomes through unknown mechanisms. Angiogenesis, the process of blood vessel formation, is crucial to fetal and placenta development. We have previously shown that cART-exposure in a mouse preg-

nancy model leads to reduced fetal and placenta weight. Here we investigate the effects of cART on placental angiogenesis in this mouse model.

**METHODS:** Pregnant C57Bl/6 mice were exposed to human equivalent doses of lopinavir/ritonavir/AZT/3TC or vehicle throughout gestation. Pregnancy loss, fetal number, viability and weight, and placenta weight were recorded on gestational day 15. Angiogenic factors in placenta and maternal blood were analysed by q-PCR and ELISA. Some placentas were perfused with a casting agent into the arterial vasculature, and then scanned using a micro-CT.

**RESULTS:** cART exposure resulted in significantly lower fetal and placental weight compared to control. Expression of pro-angiogenic factors vascular endothelial growth factor (VEGF), VEGF receptor-2, and placenta growth factor did not differ between groups. Expression levels of the anti-angiogenic factor soluble VEGF receptor-1 (sVEGFR1) were significantly lower in the cART-exposed group. Placental vascular imaging revealed a significantly higher number of arterioles with shorter length in the cART-exposed group.

**DISCUSSION:** Our findings suggest that cART exposure alters the angiogenic balance during pregnancy. cART was associated with a pro-angiogenic state characterised by lower sVEGFR1 levels and greater branching of small blood vessels in the placenta. This state correlated with fetal growth restriction. These results address a gap in knowledge of HIV antiretroviral toxicity in pregnancy. We are currently investigating the mechanisms involved in cART-induced down-regulation of sVEGFR1 and are extending our findings to HIV+ pregnant women. Understanding the impact of cART on angiogenic processes during pregnancy may lead to better clinical management of HIV+ pregnant women.

### CS45

#### ARE PREGNANCIES AMONG HIV-POSITIVE PREGNANT WOMEN ALWAYS COMPLICATED?

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**OBJECTIVE:** To review the incidence of antenatal complications among a cohort of HIV-positive pregnant women cared for at one center over a ten-year period.

**STUDY DESIGN:** A retrospective review of all HIV-positive pregnant women cared for at an urban tertiary care center from March 2000-March 2010. Data collected included the presence of other infectious or medical conditions, genetic screening information, and the presence or absence of antenatal complications.

**RESULTS:** There were 142 singleton pregnancies during the study period. Almost 95% of women were on combination antiretroviral therapy during pregnancy and >90% had viral loads <1,000 at delivery. The presence of co-infections was low (syphilis 4/142 [3%], hepatitis B 8/142 [6%], hepatitis C 2/142 [1%], gonorrhea/chlamydia 3/142 [2%]), although 10/142 (7%) had a history of tuberculosis (tb). 41 (29%) women had other medical co-morbidities, with the most common being tb, asthma and hypertension. 104/142 (73%) of women had genetic screening in their pregnancies, with 4/104 (4%) results abnormal. One woman underwent amniocentesis, and there were no genetic abnormalities in any babies born to the entire cohort, including the 4 women with abnormal testing. With respect to other complications of pregnancy, 7/142 (5%) women had pregnancy-induced hypertension or preeclampsia, 10/142 (7%) had gestational diabetes (6 managed with diet control and 4 with insulin), and 5/142 (4%) had fetal growth restriction. The rate of group B streptococcus (GBS) positivity was 45/142 (32%).

**CONCLUSION:** Although some studies have found increased rates of adverse pregnancy outcomes, in this cohort of well-controlled HIV-positive pregnant women, the rates of co-infection and co-morbidities were low, and there were also low risks of genetic abnormalities and pregnancy complications. GBS rates were higher than among the general population.

## Clinical Sciences: HIV in Children and Adolescents

### Sciences cliniques : Le VIH chez les enfants et les adolescents

#### CS47

#### REPORT OF TWO SERONEGATIVE HIV-1 VERTICALLY INFECTED CHILDREN WITHOUT EARLY AGGRESSIVE CART

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<sup>1</sup>Edmonton, AB; <sup>2</sup>Ottawa, ON

Antibody detection beyond 18 months of age is diagnostic of pediatric HIV-infection. Absence of antibody beyond 18mo has recently been reported in vertically infected children treated with early, aggressive combination anti-retroviral therapy (cART) and is associated with markedly reduced latent HIV reservoirs and sustained viral remission.

We report two children with virologic evidence of HIV-1 infection but negative serology beyond 18 months of age. Case 1 (2yr male born in Lesotho) received nevirapine beginning at 2wk, then cART (zidovudine, lamivudine, lopinavir/ritonavir) from 3mo, based on two positive HIV DNA PCR results at 6 and 10 wk. He had chronic cough, failure to thrive, and was treated for presumed tuberculosis (age 5-11 months). He immigrated to Canada with his adoptive parents at age 14mo, at which time he was asymptomatic, with normal CD4 count, negative HIV-1/2 serology, and undetectable (<40 copies/mL) HIV RNA on cART. HIV-1/2 antibody and RNA remained negative/undetectable on repeated testing. HIV-1 pro-viral DNA was positive. Normal levels of total IgG and appropriate antibody response to live viral vaccines were demonstrated. Case 2 (4 yr male born in Vietnam) received cART from 3wk, had failure to thrive, and had a detectable HIV-1 viral load (78 copies/mL) at the time of immigration to Canada (11mo). His CD4 count remained in the normal range on zidovudine, lamivudine, lopinavir/ritonavir, with intermittently detectable HIV RNA (230 copies/mL at 14 mo, 90 copies/mL at 24 mo). HIV-1/2 antibody was indeterminate at 10mo and 16mo, then negative at 19 mo. HIV-1 proviral DNA was positive (subtype CRF34\_01B). Antibody response to hepatitis B vaccine was adequate. Unlike recently reports of seroreversion following very early, effective cART, both seronegative international adoptees in this report has evidence of poorly controlled HIV replication in infancy. Further study (e.g., quantifying HIV reservoir) may illuminate seronegativity as a marker of sustained viral remission versus B-cell energy.

#### CS48

#### NEUROCOGNITIVE OUTCOMES IN PRE-SCHOOL AND EARLY SCHOOL-AGE HIV-EXPOSED UNINFECTED CHILDREN EXPOSED PRE- OR PERINATALLY TO ANTIRETROVIRAL MEDICATIONS

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<sup>1</sup>Mississauga; <sup>2</sup>Toronto, ON

**BACKGROUND:** The nucleoside reverse transcriptase inhibitors alter mitochondrial replication and function. Since brain development requires energy, medications affecting mitochondrial energy production during fetal life and infancy could affect brain development. Studies of infants and toddlers suggest no effect of pre- and peri-natal antiretroviral drug exposure (ARV) on early cognitive and adaptive function, but little is known about longer-term outcomes. We report here on neurodevelopmental outcomes of 3 to 6 year old HIV-exposed uninfected (HEU) children exposed in utero and perinatally to ARVs, in comparison to a sociodemographically matched control group.

**METHODS:** HEU children underwent neurodevelopmental assessments as part of routine care in the SickKids Family-Centred HIV Clinic. A control group was recruited in the communities where the HEU children are known to live. Children were administered standardized tests of intelligence and the Vineland Adaptive Behaviour Scales. Children were divided into two groups: mean age 3.5 years and 5.5 years.

**RESULTS:** 110 children (74 HEU, 37 controls) were assessed. Their families were from an ethnically diverse, largely immigrant background, with maternal country of origin being Africa (32% HEU, 24% Controls), Canada (28% HEU, 24% Control), the Caribbean (23% HEU, 27% Control), South/Southeast Asia (11% HEU, 16% Control); and South America (5% HEU, 8% Control). There were no group differences in birth weight, gestational age, and maternal education or employment status. At age 3.5, the HEU and control groups did not differ on IQ, but the HEU children had significantly lower adaptive function. The 5.5-year-olds differed from controls on IQ and adaptive function.

**CONCLUSIONS:** Adaptive skills were reduced at both ages in ARV-exposed children. Differences in intelligence emerge with increased age, highlighting the importance of examining long term development. It remains to be determined whether cognition worsens and whether other deficits appear with increased age. These findings need replication in larger samples.

#### CS49

#### IMPLEMENTATION OF A CMV SCREENING PROGRAM FOR INFANTS OF HIV INFECTED MOTHERS BY SALIVARY PCR AND/OR CULTURE: RESULTS FROM A SINGLE CENTER

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**Lapointe, Normand; Lamarre, Valerie**

Montreal, QC

**BACKGROUND:** Congenital Cytomegalovirus infection (cCMV) is the leading cause of congenital infection worldwide, and while HIV-infected women have a higher rate of transmission of cCMV, there are currently no recommendations for the screening of their newborns. We report on a pilot cCMV-screening program for HIV-exposed newborns at CHU Sainte Justine (HSJ).

**METHODS:** A CMV screening protocol was implemented in the HSJ nursery for infants of HIV exposed mothers beginning in April 2013, and consisted of testing by salivary swab for cCMV using 1) PCR or 2) Standard culture/shell vial, within 3 days of birth. The medical records of all HIV exposed infants born between April 2013 and Nov 2014 were reviewed to determine adherence to the protocol.

**RESULTS:** Among 56 live births to 58 HIV infected mothers, 48 newborns were successfully tested for cCMV (12.5% by PCR alone, 64.5% by CMV shell vial/culture, and 23% by both PCR and shell vial/culture). PCR results were available within a mean of 4.72 (range 1-6) days after birth, and CMV shell vial results within 6.42 (range 2-22 days) after birth. 92% of the women had been tested for CMV during pregnancy, among whom 98% were CMV IgG positive – mean IgG immune status ratio was 3.20 (SD 1.16) with a positive cutoff  $\geq 1.10$ . Only one case of cCMV infection was identified by screening PCR, and confirmed by positive urine culture at 13 days of life. The overall birth prevalence of cCMV in this cohort was 2.1%.

**CONCLUSIONS:** CMV screening by salivary swab in newborns is a feasible, practical and time sensitive method of screening for cCMV. Given the potential to improve childhood outcomes by early diagnosis and treatment, further work is necessary to determine the cost effectiveness of such a screening program in the general population of HIV exposed infants.

#### CS50

#### THERAPEUTIC DRUG MONITORING OF ANTI-RETROVIRAL AGENTS IN HIV-INFECTED CHILDREN

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Toronto, ON

**BACKGROUND:** There have been no studies directly assessing the utility of therapeutic drug monitoring (TDM) in the pediatric HIV population. Routine TDM was implemented on a trial basis in the HIV Clinic at the Hospital for Sick Children in March 2014. The purpose of this project was to assess the utility of this strategy.

**METHODS:** This was a prospective observational study of routine TDM for protease inhibitors (PIs), non-nucleoside reverse transcriptase inhibitors (NNRTIs) and integrase inhibitors (IIs) in combination antiretroviral therapy (cART) treated HIV-infected children. Voluntary informed consent was required. Outcome measures included the proportion of se-



rum antiretroviral medication (ARV) levels in the therapeutic range and correlation of levels with virologic control, adherence and toxicity.

**RESULTS:** Forty-eight of 64 cART treated children in the clinic were recruited (75%). Their median age, viral load (VL) and CD4 percent were 13 (3-18) years, <40 (<40-124) copies/mL and 37.4% (8.4-47.9%), respectively; 45.8% were female. VL was <40 copies/mL in 91.7%. Adherence was assessed as excellent (>95%) in 95.8%. Fifty baseline trough serum levels were taken, including 19 (38%) for PIs, 27 (54%) for NNRTIs, and 4 (8%) for IIs. Sixty-eight percent (n=34) of levels were within the therapeutic range, 10% (n=5) were subtherapeutic, and 22% (n=11) were supratherapeutic. The highest proportion of therapeutic levels were within the NNRTI class (77.8%) followed by PIs (52.6%) and IIs (50%) (p=0.047). There was no statistically significant correlation between serum ARV levels and demographic data, VL, CD4%, adverse event scores, or adherence. Only one dose adjustment was made for subtherapeutic raltegravir levels due to a presumed interaction with ritonavir.

**CONCLUSION:** This study does not support routine use of TDM in generally healthy, well-controlled cART-treated HIV-infected children. A more targeted strategy, such as when adherence is questioned or when there are suspected drug interactions, may be more appropriate.

## Clinical Sciences: HIV in Vulnerable Populations and Global Health Issues

## Sciences cliniques : Le VIH dans les populations vulnérables et les enjeux sanitaires mondiaux

### CS51

#### JINJA DISTRICT: THE IMPLICATION OF LOW KNOWLEDGE ON TRANSMISSION AND PREVENTION OF HIV/AIDS AMONG THE YOUTH

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**Jinja, Uganda**

**INTRODUCTION:** Youth constitute 78% of Uganda's population. HIV prevention programmes should pay special attention to this group to prevent devastating effects HIV can have on the country. This paper highlights the implications of low knowledge of the youth on HIV/AIDS in Jinja district.

**OBJECTIVE:** To highlight the implications of low knowledge of youth on HIV/AIDS transmission and prevention to inform interventions

**METHODS:** Lot Quality Assurance Sampling Methodology was adopted. Jinja district was divided into five supervision areas. Nineteen villages were selected from each Supervision Area. Data was collected from youth between 15 and 24 years. The youth were asked information on the following sub categories: HCT, PMTCT, HIV knowledge and sexual behavior. Data was analyzed in Ms. Excel.

**RESULTS:** Over 90% of the Youth sampled were above 19 years and 60% had partners. 42.1% were able to identify atleast three benefits of HIV counselling and testing. 42.1% had tested for HIV in the past twelve months and received their results. When asked information about PMTCT, 14.7% knew when HIV can be transmitted from an infected mother to her child. When asked about the knowledge on HIV and Sexually Transmitted Infections (STIs), 13.7% were able to correctly identify ways of preventing sexual transmission of HIV and reject major misconceptions about HIV transmission. 35.8% were able to identify atleast two symptoms of STIs in men while 37.9% were able to identify atleast two symptoms of STIs in women.

**CONCLUSION:** Majority of the youth do not understand the benefits of HIV counselling and testing and when transmission of HIV can occur from an infected mother to her baby. This has implications on whether they then will seek for HIV testing and prevent HIV infections. Therefore involvement of key stakeholders should be prioritized to design specific interventions to curb the increasing HIV infections.

### CS52

#### REDUCING GAPS IN THERAPY BY INVOLVING CLINICAL PHARMACISTS IN THE CARE OF PATIENTS WITH HIV AT A LARGE CORRECTIONAL FACILITY

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**Edmonton, AB**

**BACKGROUND:** Inmates identified as HIV-positive upon admission into a large remand facility in a northern Canadian city are seen by an infectious disease physician at bi-weekly onsite outreach HIV clinics. This facility has the ability to house up to 1,900 inmates with an average length of stay of 17 days, making the timely provision of HIV care challenging. Patients frequently reported delayed, missed or incomplete antiretroviral therapy (ART) due to the rapid turnover within the facility and the lack of onsite prescribers to promptly ensure ART continuance. The objective is to describe a pharmacist-led initiative aimed at reducing gaps in ART in this vulnerable population.

**DESCRIPTION:** Since April 2013, this facility has been supported by clinically deployed pharmacists who provide comprehensive medication management. In accordance with provincial regulations, pharmacist scope of practice includes the ability to prescribe with varying degrees of independence, and all licensed pharmacists can adapt prescriptions for continuity of care based on their assessment. On admission, all HIV-positive patients are assessed by a pharmacist to ensure ART is continued promptly and appropriately and to initiate planning for release. The infectious disease physician is only involved in the initial management of these patients if concerns are identified, or if the pharmacist determines more urgent specialist consultation is required. To ensure issues arising during incarceration are managed appropriately, the need to have a designated pharmacist follow HIV patients was identified. Ongoing improvements include pharmacist training via formal education and informal mentorship with local HIV pharmacists.

**CONCLUSIONS:** Although further research is required to fully capture the impact of this initiative, preliminary feedback indicates that the incidence of missed ART doses has declined since pharmacists began continuing ART therapy upon admission to the facility. Through this collaborative interdisciplinary initiative, there has been improved care of HIV patients within this correctional facility.

### CS53

#### ASSESSING THE EFFECT OF RURALITY ON THE PROGRAMMATIC COMPLIANCE SCORE, A METRIC PREDICTIVE FOR ALL-CAUSE MORTALITY AMONG TREATMENT-NAÏVE HIV-POSITIVE INDIVIDUALS STARTING ANTIRETROVIRAL THERAPY IN BRITISH COLUMBIA – IS THERE A RURAL/URBAN GAP?

**MacKenzie, Lauren J<sup>1,2</sup>; Hull, Mark W<sup>1</sup>; Samji, Hasina<sup>1</sup>; Lima, Viviane D<sup>1</sup>; Yip, Benita<sup>1</sup>; Zhang, Wendy<sup>1</sup>; Lourenco, Lillian<sup>1</sup>; Colley, Guillaume<sup>1</sup>; Hogg, Robert S<sup>1</sup>; Montaner, Julio S<sup>1</sup>**

**<sup>1</sup>Vancouver, BC; <sup>2</sup>Winnipeg, MB**

**BACKGROUND:** The unique challenges of remoteness and geographic isolation faced by rurally located HIV-positive individuals can negatively affect their care outcomes. This study looked at whether rurality and/or the degree of rurality of antiretroviral therapy (ART)-naïve individuals impacts their Programmatic Compliance Score (PCS), a previously validated metric for all-cause mortality.

**METHODS:** We determined the PCS score for all patients (≥19 years) initiating ART in British Columbia between 2000-2013. The PCS score is a sum of six outcome measures scored from 0-6, where zero is most compliant, and six is least compliant with established treatment guidelines. Rurality was determined for each individual at time of ART initiation using 1) a categorical Postal Code method; and 2) the General Practice Rurality Index (GPRI), a previously validated score representing their degree of rurality. Ordinal logistic regression modelling was used to assess the relationship between rurality and PCS score.

**RESULTS:** Of 4616 individuals with a PCS score, 176 were classified as rural, and 3512 as urban, using the Postal Code method (928 had an unknown postal code and were therefore excluded). GPRI score was calculated for 4544 individuals. After adjusting for age, gender, Hepatitis C status,

Aboriginal ethnicity, baseline CD4 count, and baseline viral load, categorical rurality was not associated with a higher PCS score (AOR 1.02; 95% CI: 0.57-1.84). However, the degree of rurality (per 10 increase in GPRI score) was associated with a higher PCS score (AOR 1.09; 95% CI: 1.02-1.16).

**CONCLUSION:** For individuals initiating ART, degree of rurality was predictive of poorer PCS scores, while classifying individuals as “rural” or “urban” using a categorical method was not. Given that higher PCS scores are predictive of all-cause mortality, strategies to enhance access to care for rural individuals should be evaluated to improve HIV outcomes in British Columbia.

## CS54

### THE EFFECT OF RURALITY ON THE UPTAKE OF NEW ANTIRETROVIRAL THERAPIES IN BRITISH COLUMBIA

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Hogg, Robert S<sup>2</sup>; Montaner, Julio S<sup>2</sup>

<sup>1</sup>Winnipeg, MB; <sup>2</sup>Vancouver, BC

**BACKGROUND:** Literature in the United States has shown that uptake of new antiretroviral (ARV) medications is slower in rural locations. This study examined whether rurally-located antiretroviral therapy (ART)-experienced individuals in British Columbia had a longer time-to-uptake of new ARVs compared to their urban counterparts.

**METHODS:** We included HIV-infected, ART-experienced individuals ( $\geq 19$  years) who switched to regimens that included Atripla<sup>TM</sup> (efavirenz-emtricitabine-tenofovir), raltegravir, Complera<sup>TM</sup> (rilpivirine-emtricitabine-tenofovir), or Stribild<sup>TM</sup> (elvitegravir-cobicistat-emtricitabine-tenofovir) between October 2007 and June 2014. Individuals whose initial ART regimen included these ARVs were excluded. Time-to-uptake of each ARV was measured from the date of drug availability or ART-initiation date (whichever was later) to the new ARV switch-date. Rurality was determined at ARV switch-date using 1) a categorical Postal Code method; and 2) General Practice Rurality Index (GPRI), a previously validated score representing degree of rurality.

**RESULTS:** Among 3404 individuals ever prescribed Atripla<sup>TM</sup>, raltegravir, Complera<sup>TM</sup>, or Stribild<sup>TM</sup>, 2166 were ART-experienced – 1083 had switched to Atripla<sup>TM</sup>, 948 to raltegravir, 216 to Complera<sup>TM</sup>, and 193 to Stribild<sup>TM</sup>. Of these 2166 individuals, 40.2% (870) were co-infected with Hepatitis C, 36.7% (794) had used injection drugs, and 55.0% (1192) had ART adherence rates  $\geq 95\%$ . Using the Postal Code method, 97 new ARV-switches were classified as rural, and 2048 as urban (295 had an unknown postal code and were excluded). GPRI score was calculated for 2399 new ARV-switches. A Wilcoxon rank-sum test was used to assess the relationship between rurality and time-to-uptake of each ARV. Rurally-located individuals (compared to urban) had a longer median time-to-uptake for Atripla<sup>TM</sup> (9.1 versus 6.3 months,  $p=0.024$ ) and raltegravir (27.3 versus 26.4 months,  $p=0.062$ ), but not Complera<sup>TM</sup> (14.8 versus 7.0 months,  $p=0.194$ ), or Stribild<sup>TM</sup> (1.3 versus 6.1 months,  $p=0.076$ ).

**CONCLUSION:** Rurality is associated with longer time-to-uptake of some, but not all, new ARVs. Possible reasons for rural/urban prescribing differences requires further investigation.

## CS55

### INCREASED MORTALITY AMONG ABORIGINAL PERSONS IN A MULTISITE COHORT OF PEOPLE LIVING WITH HIV IN CANADA

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<sup>1</sup>Toronto, ON; <sup>2</sup>Dartmouth, NS; <sup>3</sup>Hamilton; <sup>4</sup>Thunder Bay, ON;

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<sup>9</sup>Montreal, QC

**INTRODUCTION:** Building Bridges was a collaborative community-based research project between Aboriginal and allied stakeholders and

the Canadian Observational Cohort (CANOC) collaboration. The research team identified mortality as an endpoint of interest to compare Aboriginal and non-Aboriginal CANOC participants.

**METHODS:** CANOC is a collaboration of 8 cohorts of treatment-naïve HIV-infected participants initiating combination antiretroviral therapy (cART) after 1/1/2000. Participants were followed from the date of cART initiation until death or date of last viral load (VL) test before 12/31/2012. Cox proportional hazard models were used to estimate the effect of ethnicity on time until death after adjusting for age, gender, injection drug use, being a man who has sex with men, province of origin, baseline VL and CD4 count, year of cART initiation and antiretroviral class.

**RESULTS:** 9300 participants (498 Aboriginal Peoples, 2474 Caucasian, 789 African/Caribbean/Black (ACB), 629 other and 4910 unknown participants) were included in the analysis. 7608 (82%) were male and the median (interquartile range) age was 40 (33-46). During the study period, 794 (9%) participants died including 131 (26%) Aboriginal Peoples, 20 (3%) ACB, 185 (7%) Caucasian, 29 (5%) other ethnicity and 429 (9%) unknown ethnicity participants. Five year survival was lower for Aboriginal Peoples (68%) when compared to Caucasian (91%), ACB (97%), other ethnicity (93%) and unknown ethnicity (86%) participants ( $p<0.0001$ ). In a proportional hazard model adjusted for confounding variables, Aboriginal Peoples were more likely to die than Caucasian participants (HR=2.39,  $p<0.0001$ ) whereas mortality was similar between Caucasian, ACB (HR = 0.76,  $p=0.30$ ) and other (HR = 1.02,  $p=0.94$ ) participants.

**CONCLUSION:** The mortality rate for Aboriginal Peoples with HIV in CANOC was significantly higher than for other ethnic groups accessing cART. Addressing treatment challenges and identifying HIV-and non-HIV related causes for mortality among Aboriginal persons is required to optimize their clinical management.

## CS56

### DIFFERENCES IN TIME TO VIROLOGIC SUPPRESSION AND REBOUND BETWEEN ABORIGINAL PEOPLES AND OTHER ETHNIC GROUPS AMONG INDIVIDUALS INITIATING COMBINATION ANTIRETROVIRAL THERAPY IN A MULTISITE COHORT OF INDIVIDUALS LIVING WITH HIV IN CANADA

Benoit, Anita C<sup>1</sup>; Younger, Jaime<sup>1</sup>; Masching, Renee<sup>2</sup>; Raboud, Janet<sup>1</sup>; Nobis, Tony<sup>1</sup>; Zoccole, Art<sup>1</sup>; Nowgesic, Earl<sup>1</sup>; Keshane, Michael<sup>1</sup>; Jackson, Randy<sup>3</sup>; Walsh, Tonie<sup>1</sup>; Whitebird, Wanda<sup>1</sup>; Beaver, Kerrigan<sup>1</sup>; O'Brien-Teengs, Doe<sup>4</sup>; Jaworsky, Denise<sup>5</sup>; Hull, Mark<sup>1,5</sup>; Benson, Elizabeth<sup>6</sup>; Rourke, Sean<sup>1</sup>; Rachlis, Anita<sup>1</sup>; Hogg, Robert<sup>5,7</sup>; Burchell, Ann<sup>1</sup>; Cooper, Curtis<sup>8</sup>; Klein, Marina<sup>9</sup>; Machouf, Nima<sup>9</sup>; Montaner, Julio<sup>5</sup>; Tsoukas, Chris<sup>9</sup>; Loutfy, Mona<sup>1</sup>; On behalf of the Building Bridges Research Team and the Canadian Observational Cohort (CANOC) collaboration<sup>1,5</sup>

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<sup>5</sup>Vancouver; <sup>6</sup>Skeena Watershed; <sup>7</sup>Burnaby, BC; <sup>8</sup>Ottawa, ON;

<sup>9</sup>Montreal, QC

**INTRODUCTION:** Building Bridges was a collaborative community-based research project between Aboriginal and allied stakeholders and the Canadian Observational Cohort (CANOC) collaboration. The research team identified time to virologic suppression (VS) and virologic rebound (VR) as endpoints of interest to compare between Aboriginal and non-Aboriginal CANOC participants.

**METHODS:** CANOC participants are treatment-naïve and have initiated combination antiretroviral therapy (cART) after 1/1/2000. Fine and Gray models were used to estimate the effect of ethnicity on 1) time to VS (two consecutive viral loads (VLs)  $<50$  copies/mL at least three months apart) after adjusting for the competing risk of death and 2) time until VR (two consecutive VLs  $>200$  copies/mL at least 3 months apart) following VS. Models were adjusted for age, gender, injection drug use and men who have sex with men status, province of residence, VL measurement rate, baseline VL and CD4 count, antiretroviral class and year of ART initiation.

**RESULTS:** 9300 participants (498 Aboriginal Peoples, 8802 other race/ethnicity (e.g., African, Caribbean, or Black, Caucasians, unknown, other) were included in the analysis. 7608 (82%) were male and the median (interquartile range) age was 40 (33-46) years. VS was achieved in 7811 (84%) participants, and of these 1489 (16%) rebounded. 384 participants died before achieving VS, including 72 (14%) Aboriginal Peoples

and 312 (4%) other participants. In the adjusted model, Aboriginal Peoples were less likely to achieve VS than Caucasian participants (Hazard Ratio=0.71,  $p<0.0001$ ). In a model adjusted for the same covariates, VR (Hazard Ratio=1.10,  $p=0.39$ ) was similar between Aboriginal Peoples and Caucasian participants.

**CONCLUSION:** Among CANOC participants initiating cART, Aboriginal Peoples were less likely to achieve VS, but had similar rates of VR as other ethnic groups. Further research is required to identify socio-demographic, clinical and psychosocial predictors of VS to target interventions, programming and services to improve HIV health outcomes.

## Clinical Sciences: HIV Prevention

### Sciences cliniques : Prévention du VIH

#### CS57

#### TRANSITIONING TO PRE-EXPOSURE PROPHYLAXIS (PREP) FROM NON-OCCUPATIONAL POST-EXPOSURE PROPHYLAXIS (NPEP) IN A COMPREHENSIVE HIV PREVENTION CLINIC: A PROSPECTIVE COHORT STUDY

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Toronto, ON

**BACKGROUND:** The uptake of pre-exposure prophylaxis (PrEP) for HIV prevention remains low. We hypothesized that a high proportion of patients presenting for non-occupational post-exposure prophylaxis (nPEP) against HIV would be candidates for PrEP based on current CDC guidelines. We describe a novel, multidisciplinary comprehensive outpatient HIV prevention clinic and describe transition from nPEP to PrEP.

**METHODS:** We evaluated all patients who attended the HIV Prevention Clinic for nPEP between January 1, 2013 and September 30, 2014. Each patient was evaluated for candidacy for PrEP objectively based on current CDC-guidelines and subjectively based on physician opinion. Patients were then evaluated for initiation of PrEP if they met guideline suggestions. Demographic, social, and behavioural factors were then analyzed with logistic regression for associations with PrEP candidacy and initiation.

**RESULTS:** 99 individuals who attended the nPEP clinic were evaluated for PrEP. The average age was 32 years (range, 18-62), 83 (84%) were male, of whom 46 (55%) were men who had sex with men (MSM). 31 (31%) met CDC guidelines for PrEP initiation, which had very good agreement with physician recommendation ( $\kappa=0.88$ , 0.78-0.98). Factors associated with PrEP candidacy included sexual exposure (100% of PrEP candidates vs. 72% of non-candidates), prior nPEP (adjusted odds ratio = 27.8, 3.1-250.0), and lack of drug insurance (AOR=2.9, 1.0-9.1).

**CONCLUSIONS:** Combining nPEP and PrEP services can lead to identification of PrEP candidates and facilitates PrEP uptake. There was very good agreement between physician recommendation and PrEP guidelines. Given the high cost for PrEP, it is concerning that patients who would benefit from PrEP were less likely to have medication insurance.

#### CS58

#### SIMILAR HIV RISK PROFILES AMONG MSM REFERRED TO A PREP DEMONSTRATION PROJECT BY SERVICE PROVIDERS VS. SELF-REFERRALS

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<sup>1</sup>Toronto, ON; <sup>2</sup>Vancouver, BC

**BACKGROUND:** PREPARATORY-5 is Canada's first demonstration project of daily TDF/FTC-based HIV pre-exposure prophylaxis (PrEP), among Toronto men who have sex with men (MSM). We hypothesized that individuals referred to the study by service providers would be at objectively higher risk of HIV acquisition than those who self-referred.

**METHODS:** Trial participants were solicited through self-referrals in response to advertisements on the gay networking application Grindr and newspaper/website Xtra, and provider referrals from 13 Toronto-based community-based organizations (CBOs). Interested MSM were offered a screening visit involving testing for sexually transmitted infections and

comprehensive questionnaires including a validated HIV risk index (HIRI-MSM). A log-binomial model with sandwich estimators was fitted to examine factors associated with referral source.

**RESULTS:** By 31/12/2014, the Grindr and Xtra advertisements generated 1460 and 36 click-throughs respectively, and CBOs referred 115 individuals. 170 men inquired about the trial, of which 83 expressed interest in participating; 58 have thus far undergone screening, of which three withdrew. The remaining 55 included 42 (76%) self-referrals (27 Grindr, 3 Xtra, 12 other) and 13 (24%) provider referrals (11 clinician, 2 CBO). 96% had previously heard about PrEP, and 18% reported prior PrEP use. Prevalence of newly diagnosed syphilis was similar between groups (0/13 versus 1/42,  $p=0.57$ ). Provider-referred participants were older than self-referred participants (median age 38 versus 31.5 years,  $p=0.02$ ) but had similar HIV risk scores (median 28 versus 26.5,  $p=0.37$ ). In multivariate analysis adjusting for sexual orientation, income, education and ethnicity, age remained marginally associated with provider referral source (RR=1.08 per year, 95% CI=0.99,1.17) while HIV risk score was not (RR=1.02, 95% CI=0.91,1.14).

**CONCLUSIONS:** These preliminary findings suggest that MSM self-referring for PrEP generally had a similar clinical and HIV risk profile compared to those referred by service providers. Online strategies warrant further study for their potential to reach at-risk, previously unengaged individuals.

#### CS59

#### CHARACTERISTICS OF MEN WHO HAVE SEX WITH MEN SEEKING HIV PRE-EXPOSURE PROPHYLAXIS IN A CANADIAN DEMONSTRATION PROJECT

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**BACKGROUND:** HIV pre-exposure prophylaxis (PrEP) has not received regulatory approval for use in Canada. PREPARATORY-5, Canada's first demonstration project of open-label tenofovir/emtricitabine based PrEP, began enrolling Toronto-based adult men who have sex with men (MSM) at high risk of HIV infection in October 2014.

**METHODS:** Consenting MSM interested in participation attended a screening visit including questionnaires on socio-demographics and validated psychometric measures. The latter included the Center for Epidemiologic Studies-Depression (CES-D), Alcohol Use Disorder Identification Test (AUDIT), Drug Use Disorder Identification Test (DUDIT) and Sexual Compulsivity Scale (SCS). The HIV Incidence Risk Index for MSM (HIRI-MSM) quantified HIV risk, Multi-Axial Gay Men's Inventory—Men's Short Version (MAGI-MSV) screened for internalized homophobia, and Benefits of Barebacking Scale (BOBS) examined attitudes towards intentional unprotected anal intercourse.

**RESULTS:** As of December 11, 2014, 55 MSM completed the questionnaire. Median (interquartile range) age was 33 (28,41). All identified as gay (95%) or bisexual (6%). Most identified as Caucasian (75%), fewer as Asian (13%), Middle Eastern (6%), or Black (2%). Many had a college/undergraduate (53%) or graduate/professional degree (29%). Median income range was \$50,000-\$59,999. Median number of male sexual partners in the preceding six months was 20 (11,35). Almost all (98%) scored above the suggested HIRI-MSM cut-off for identifying MSM potentially appropriate for PrEP). Approximately 42% screened positive for depression, 9% for at-risk drinking, and 31% for sexual compulsivity, with 18% being heavily influenced by drugs at least once per week. The median MAGI-MSV score of 8.0 (2,13) suggested minimal internalized homophobia. The median BOBS score of 30 (23,36) suggested moderate value placed on barebacking.

**CONCLUSIONS:** Results suggest potential high prevalence of health concerns in MSM seeking PrEP in Toronto. The role of co-occurring health concerns (syndemics) in mediating HIV risk in PrEP users and their association with longer term health outcomes warrants further exploration.



## CS60

## PREP IN REAL-LIFE SETTINGS: GOOD ADHERENCE AND NO INCREASE IN HIGH-RISK BEHAVIOR

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Montreal, QC

**BACKGROUND:** Little is known about pre-exposure prophylaxis (PrEP) use and adherence in real-life settings and its impact on high-risk behaviors is unclear. We aimed to evaluate adherence to follow-up and treatment, and behavioral changes in a high-risk clinical population.

**METHODS:** We prospectively assessed patients receiving PrEP (TDF-FTC) at our clinic from 2011-2014. After their initial visit, patients were seen at 3-month follow-up intervals (FU). Treatment adherence and behavioral data were measured by self-report at every FU visit. Adherence and behavioral changes were analyzed by  $\chi^2$  and time to treatment discontinuation was estimated by Kaplan-Meier analysis.

**RESULTS:** 112 patients were prescribed PrEP. The main indication for PrEP was regular unprotected anal intercourse (64%). Patients requesting PrEP were male (99%) and MSM (98%) with a mean age of 38 (Range=20-61y). The majority of patients had a history of STDs (80%) and 67% reported having more than 10 sexual partners. On average, condom use was 59% for receptive anal intercourse and 63% for insertive. Among the 87 patients with available FU data, median FU was 12 weeks. In the first 3 months after starting PrEP, 92% of patients attended a FU visit. Furthermore, 86% of patients reported taking PrEP daily, whereas 2% had adherence problems and 4% took PrEP intermittently. Overall, 18 patients (21%) stopped PrEP; 44% of which occurred in the first 3 months of FU. Five patients (5/18, 28%) discontinued due to adverse events: four patients had elevated creatinine and 1 patient suffered from nausea and vomiting. Increases in high-risk behavior following PrEP use were not observed. There was no difference among the reported number of sexual partners ( $p=0.557$ ) and condom use ( $p=0.293$ ).

**CONCLUSION:** Patients receiving PrEP seem adherent to treatment and to follow-up. However, one-fifth discontinued prophylaxis. PrEP does not promote an increase in high-risk behaviors.

## Clinical Sciences: Substance Use and HIV

## Sciences cliniques : Toxicomanies et VIH

## CS61

## FEASIBILITY OF CASE MANAGEMENT FOR HIV-INFECTED PATIENTS WITH SUBSTANCE USE DISORDERS.

## TRANSLATING EVALUATION RESEARCH INTO PRACTICE AT THE CHRONIC VIRAL ILLNESS SERVICE IN MONTREAL

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**BACKGROUND:** Case Management (CM) improves the care of HIV-infected patients with substance use disorders (SUDs). Little is known about factors affecting CM implementation within existing clinical settings. We report on the feasibility, specifically, practicality (extent to which an idea can be implemented using existing resources) of developing and delivering a CM intervention: FEAT (Find, Engage And Treat). **METHODS:** Frameworks for designing and evaluating complex interventions (Craig et al. 2008) and feasibility studies (Bowen et al. 2009) were used to identify and analyze information. Data related to practicality (e.g., appointment dates, number confirmed SUDs) were collected and considered.

**RESULTS:** FEAT was developed over 11 months involving frequent consultations with clinic staff, selection of clinical and evaluation tools (e.g., e-version of the Addiction Severity Index, Teamwork.com), agreement on a mixed CM model (time divided between FEAT and regular patients), and training of personnel. Screening for SUDs identified 22 pa-

tients; 9 confirmed positive. The clinical team referred 23 patients with SUDs. Of the 32 patients confirmed with SUDs, 14 enrolled in FEAT and 13 received an individualized care plan. Reasons for non-participation included not interested and no financial incentive. Main difficulties related to the intervention (patient screening, finding instruments in Spanish, time required for assessments), the capacity to locate and reach some patients, and the clinical setting (space for privacy, clinic expansion). The intervention was refined to meet these challenges. The faster pace at which recently recruited patients go from screening to care plan and the interest expressed by other clinical staff to become case managers suggest an improved and acceptable intervention.

**CONCLUSION:** The development and delivery of a complex intervention requires frequent and diverse feedback to refine its components and related processes. Successful implementation of a mixed CM model is threatened in milieus that are under pressure because of changing resources.

## Clinical Sciences: Other

## Sciences cliniques : Autres

## CS62

## MANY LOW LEVEL VIRAL LOAD VALUES ARE LIKELY ASSAY FALSE POSITIVE RESULTS RATHER THAN GENUINE "BLIPS" IN VIREMIA

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**BACKGROUND:** Appropriate management of low-level viremia is an ongoing issue in patient care for HIV infection. We wished to examine whether there was evidence that some low level viral load measurements are simply assay "false positive" values, rather than resulting from other factors such as intermittent periods of non-adherence.

**METHODS:** The distribution of all viral load values reported to the BC Centre for Excellence in HIV/AIDS in 2013 was examined (N=28,469 tests). During 2013, the Roche COBAS AmpliPrep/COBAS TaqMan HIV-1 Test v2.0 assay was used.

**RESULTS:** More than 77% of samples tested had a pVL <50 copies/mL. Assay results with low values >50 copies/mL were systematically overrepresented, with the prevalence decreasing monotonically with the reported value. For example, there were 64 observations of "51 copies/mL", 54 observations of "52 copies/mL", 42 observations of "53 copies/mL", etc, up to ~250 copies/mL. In contrast, 95% of individual viral load values between 500-1000 copies/mL had 0, 1, or 2 observations. A similar pattern was observed for other years examined.

Patients receiving constant therapy for >6 months with initial pVL in the 50-100 copies/mL range were >2.5-fold more likely to have a confirmatory pVL measurement (collected within 15 days) <50 copies/mL than those with initial pVL in the 500-1000 copies/mL range. (<20% vs >50%, respectively)

**CONCLUSIONS:** The suspicious distribution of pVL values suggest that low viral load measures may commonly represent assay false-positive results, and reinforces the fact that viral load measurements should not be used as an HIV diagnostic test. A similar analysis of large numbers of viral load measurements using the Abbott RealTime assay is in progress to establish whether this is a generic problem with viral load measurement.

## CS63

## EMERGENCY DEPARTMENT UTILIZATION BY PERSONS WITH HIV: A POPULATION-BASED STUDY

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<sup>1</sup>Toronto; <sup>2</sup>Ottawa, ON

**BACKGROUND AND OBJECTIVES:** Population-based studies describing rates of emergency department utilization by persons living with HIV are lacking. Because emergency room visits may be emblematic of poor linkage with primary care, particularly for non-urgent conditions, such data are required to optimize healthcare delivery to persons with

HIV. Accordingly, we compared rates of emergency department visits between persons living with and without HIV in Ontario between April 1, 2011 and May 31, 2012.

**METHODS:** We conducted a population-based study using Ontario's health administrative data. Individuals living with HIV were frequency matched to 4 non-infected individuals on age, sex and Ontario census division. We used multivariable negative binomial regression with a random intercept to compare rates of emergency department visits and generalized estimating equations with a logit link function to examine the association of HIV infection with hospital admission following an emergency department visit. We used the Canadian Triage and Acuity Scale (CTAS) to classify emergency room visits according to severity of patient presentation.

**RESULTS:** We studied 14,534 individuals living with HIV and 58,136 matched control individuals. Following multivariable adjustment for demographic variables, comorbidity and primary care use, rates of emergency department utilization were higher for persons with HIV (67.3 vs. 31.2 per 100 person-years; adjusted rate ratio 1.58; 95% confidence interval 1.51 to 1.65). Similar results were observed following stratification by urgency of visit. Persons with HIV were also more likely to be admitted to hospital following an emergency department visit (adjusted odds ratio 1.55; 95% confidence interval 1.43 to 1.69), including for visits classified as non-urgent by CTAS score.

**CONCLUSION:** Persons with HIV have higher rates of emergency department visits and subsequent hospitalizations, including visits classified as less urgent by CTAS score. These results could reflect inadequate access to primary care.

## CS64

### EFFECTIVENESS OF AEROBIC EXERCISE FOR ADULTS LIVING WITH HIV: A COCHRANE COLLABORATION SYSTEMATIC REVIEW UPDATE

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**OBJECTIVE:** To examine the safety and effect of aerobic exercise interventions on immunological and virological, cardiopulmonary, weight and body composition, strength, and psychological outcomes in adults living with HIV.

**METHODS:** We conducted an update of a systematic review of literature on HIV and exercise according to Cochrane protocol searching databases up to April 2013. We included randomized controlled trials comparing aerobic exercise with no exercise or another intervention performed at least 3 times/week for at least 4 weeks among adults (18 years or older) living with HIV. Two reviewers independently determined study eligibility. Data were extracted from studies that met inclusion criteria using standardized forms. We assessed methodological quality using the Cochrane Risk of Bias Tool. Outcomes were analyzed as continuous and meta-analyses conducted using random effects models with RevMan5 computer software.

**RESULTS:** Twenty-four studies met inclusion criteria (n=956 participants); the majority were men (73%), taking combination antiretroviral therapy. Exercise included aerobic exercise alone (11 studies) or a combination of aerobic and resistive exercise (13 studies) ranging from 5 to 52 weeks. Sixty-eight meta-analyses were performed. Main results indicated statistically significant improvements in selected outcomes of cardiopulmonary status (maximum oxygen consumption, exercise time), body composition (lean body mass, percent body fat, leg muscle area), strength (chest press, knee flexion), depression symptoms, and quality of life (SF-36 questionnaire) among exercisers compared with non-exercisers. Greater improvements were found among participants exercising at greater intensity. No significant differences in change in CD4 count and viral load were found.

**CONCLUSIONS:** Performing aerobic exercise or a combination of aerobic and resistive exercise at least 3 times/week for at least 5 weeks is safe and can lead to improvements in cardiopulmonary fitness, body composition, strength and quality of life for adults with HIV. Findings are limited to participants who continued to exercise. Aerobic exercise is safe and beneficial for adults living with HIV who are medically stable.

## CS65

### THE LIVED EXPERIENCE OF THE HOSPITAL DISCHARGE 'PLAN': A CASE STUDY OF ADULTS LIVING WITH HIV/AIDS AND COMPLEX LIVES

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**BACKGROUND:** Discharge from hospital is often framed as a clinical success. For people living with HIV/AIDS (PHAs) who experience psychosocial challenges and medical complexity, this transition period is a high-stress time, which can contribute to hospital re-admission. Research has left unexamined the congruency between the clinicians' discharge plans and the clients' experience of the execution.

**METHODS:** A mixed-methods case study approach was utilized to explore factors that impact the discharge and transition period of PHAs who received in-patient care at Casey House (a sub-acute care HIV hospital). Demographic and medical data were abstracted from hospital charts and discharge planning documentation. Semi-structured interviews were conducted at four timepoints (approximately one week pre-discharge to one month post-discharge). Clinical data were analyzed and reported using descriptive statistics. Interview data were analyzed using qualitative thematic analysis across time and cases to capture the lived experience at each timepoint.

**RESULTS:** Data were collected from nine participants between October 2013 and June 2014. Participants presented with complex medical and psychosocial challenges, including substance use (n=8), psychiatric diagnoses (n=9) and a mean of 5 medical comorbidities (range 2-8). Participants were discharged with an average of 7 referrals and 15 medications. Discharge plans outlined medication adherence strategies and referrals. Analysis revealed significant discrepancies between "the plan" and post-discharge "reality" including minimal referral uptake, lack of social support, substance use relapse and poor medication adherence. Clinicians' use and defining of terms such as 'social support' and 'medication adherence' differed from that of the participants and post hospitalization expectations of clinicians were not realistic given the context of participants' lives.

**CONCLUSIONS:** This unique longitudinal study identified challenges experienced by complex clients in the execution of hospital discharge plans. The study findings have implications for future research, policy, and clinical practice in the delivery of hospital discharge services for PHAs.

## CS66

### PREVALENCE AND RISK FACTORS FOR GASTROINTESTINAL SYMPTOMS (GIS) IN HIV: PERSISTENCE IN THE MODERN ARV ERA

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**BACKGROUND:** GIS continue to be side-effects of HIV disease and ARV, associated with reduced quality of life and ARV non-adherence. Understanding up-to-date risk factors for GIS in a modern ARV era is important to inform clinical management.

**METHODS:** The OHTN Cohort Study is a multi-site clinical cohort of persons in HIV care in Ontario. We analysed data from 1744 participants with ≥2 interviews between 2007-2013 and who completed the ACTG Symptom Distress Module. Measured GIS were nausea/vomiting, diarrhea, appetite loss, bloating, or weight loss in the past 30 days and their perceived level of distress. We tested trends in GIS scores (range 0-20, where a higher score indicated more symptoms with greater distress) using generalized linear mixed models with random effects.

**RESULTS:** At first questionnaire, most were male (78%), Canadian born (54%), white (53%), employed (41%), mean age 44.9 (SD 10.5) years, and median time since HIV diagnosis of 9.7 (IQR 3.9, 16.9) years. Majority (89%) were ARV experienced, mean CD4+ count 498 (SD 279) cells/μL and 1,365 (84%) virologically suppressed (<200 copies/mL) at baseline. Two-thirds (68%, 95% CI 64.7, 69.3) reported ≥1 GIS with median score of 2 (IQR 0, 6) and 522 (44%) indicated moderate to severe symptom distress. Among those reporting GIS, bloating (41%), diarrhea (39%), appetite loss (24%), nausea/vomiting (21%), and weight loss (21%) were reported. Participants had median of 2 (IQR 1, 4) question-

naires. In multivariable analyses, GIS score was significantly higher among those with depressive symptoms ( $\geq 16$  score, CES-D:  $B=1.23$ ,  $p<0.001$ ), who had history of IDU ( $B=1.02$ ,  $p<0.001$ ), hepatitis C co-infection ( $B=0.74$ ,  $p<0.001$ ), and were born in Canada ( $B=0.44$ ,  $p<0.001$ ). On average, GIS scores decreased significantly with each year since HIV diagnosis ( $B=-0.55$ ,  $p<0.001$ ). Current ARV regimen and 30 day adherence ( $>95\%$ ) were not significant.

**CONCLUSIONS:** Although there is uncertainty regarding specific causes of GIS in this population, our findings suggest that clinical management of GIS is still relevant in the modern ARV era, particularly among those with depressive symptoms.

## CS67

### MEASURING HEALTH RELATED QUALITY OF LIFE (HRQOL) IN HIV POSITIVE INDIVIDUALS – CONTENT ANALYSES OF MEASURES BASED ON THE INTERNATIONAL CLASSIFICATION OF FUNCTIONING, DISABILITY AND HEALTH (ICF) AND GENERIC & DISABILITY CORE SET

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Hamilton, ON

**BACKGROUND:** The International Classification of Function, Disability and Health (ICF) is an international language for describing health and disability. It can be used as a content analysis tool to understand the construct and dimensions of health-related quality of life (HQOL) measures. Content analysis is a standardized method of linking items from a specific measure to the ICF. It provides insight into the heterogeneity, precision and depth of each measure so that clinicians and researchers can choose the instrument most suitable for their needs. There are no content comparisons of HIV specific HQOL measures with the ICF. The purpose of the study is to conduct a content analysis of the items of the Medical Outcome Study-HIV (MOS-HIV), the Multidimensional Quality of Life-HIV (MQOL-HIV) and the HIV Disability Questionnaire (HDQ) by linking these to the ICF and its generic & disability core set.

**METHODS:** Four raters individually linked 145 items from the measures based on standardized linking rules. Inter-rater agreement was determined. For items where there was no agreement among raters, the opinion of a fifth rater, an expert in applying the ICF was obtained.

**RESULTS:** The items were linked to 73 ICF categories across the three measures. Final inter-rater agreement was 83.3%. The content of all three measures was highly linkable with ICF. The HDQ had the best representation among the three measures. It was 56% linkable with the generic & disability core set; of these 70% were linked with disability codes.

**DISCUSSION:** The HDQ provides a more precise description of the disablement experienced by people living with HIV (PHA) by addressing the body function, activities, participation and environmental factors specific to PHAs. HDQ is thus recommended for those who are interested in measuring HIV-specific disabilities more precisely.

## Epidemiology and Public Health: Demography of HIV and Estimates of Key Population Sizes

## Épidémiologie et santé publique : Démographie du VIH et estimations de la taille des populations clés

## EPH01

### UNDERSTANDING FEMALE SEX WORKERS' EARLY HIV RISK AND THE IMPLICATIONS FOR HIV EPIDEMIC CONTROL (TRANSITIONS STUDY): MAPPING AND ESTIMATING THE POPULATION SIZE OF FEMALE SEX WORKERS IN MOMBASA, KENYA AND DNIROPETROVSK, UKRAINE

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Prevention interventions targeted to female sex workers (FSWs) are a key component of HIV prevention programs globally, particularly in regions where commercial sex fuels and sustains heterosexual HIV epidemics. However, targeted preventive interventions (TIs) reach women after they self-identify as sex workers, thus raising concerns that HIV acquisition by women prior to, and within the very early stages of formal sex work, could mitigate the impact of TIs on reducing HIV incidence among FSWs and in the wider community. The overall goal of this study is to characterize HIV risk faced by young women during the transition period (from first sex until self-declared entry into sex work, including periods of casual sex and transactional sex if applicable) and during the access gap (the first two years of formal sex work, but prior to program engagement), and to examine the importance of this early HIV risk for HIV epidemic control. Mapping and estimating the population sizes of FSWs and young women during the transition period in Mombasa, Kenya and Dnipropetrovsk, Ukraine, are central to the Transitions Study. Unlike conventional mapping, which counts predefined risk groups, the approach used in this study geographically locates and profiles risk behaviors irrespective of occupation.

This presentation will 1) provide an overview on the mapping and enumeration methodology used for Transitions; 2) share some early mapping findings from Mombasa and Dnipropetrovsk, including types of venues where FSWs solicit clients and information on the extent to which these venues overlap with places where casual and/or transactional sex is sought; 3) provide an estimate on the population sizes of FSWs and young women aged 14-24 years who are in the transition period at the two study sites; and 4) highlight new analyses planned for the mapping data.

## EPH02

### ESTIMATING THE SIZE OF THE MSM POPULATION USING MULTIPLE METHODS AND DATA SOURCES IN VANCOUVER, BRITISH COLUMBIA

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<sup>1</sup>Vancouver; <sup>2</sup>Victoria; <sup>3</sup>Burnaby, BC

**BACKGROUND:** Lack of a reliable population size estimate is a challenge to conducting MSM research, impeding an accurate depiction of the HIV epidemic in the population.

**METHODS:** We estimated the total Metro Vancouver MSM population using data from a bio-behavioural longitudinal cohort study of MSM ( $\geq 16$  years of age) and provincial epidemiological surveillance, and used estimates from social networking site Facebook and mobile phone app Grindr for comparison. Estimates were calculated using the indirect method ( $N=n/p$ ), where  $N$  is the population estimate,  $n$  is the number of MSM



in the group and  $p$  is the proportion of the survey population self-reporting group membership, and the 'Wisdom of The Crowds' (WOTC) method using survey participant estimates. All estimates were for 2012-2014, rounded to the nearest hundred, and limited to the Metro Vancouver area.

**RESULTS:** Table 1 demonstrates our results. The WOTC method produced the lowest calculated population estimate, 45,800 (IQR: 200-75000), while HIV testing site data suggested the largest, 63,800. The web/app-based estimates ranged from 18,200 for Facebook to 51,700 for Grindr. The much larger estimate for Grindr may be explained by the site being directed at MSM while Facebook is not.

| Wisdom of the Crowds (WOTC) |              |           |
|-----------------------------|--------------|-----------|
| Mean                        | Median       | IQR       |
| 45800                       | 10000        | 200-75000 |
| Health Services/Testing     |              |           |
|                             | n/p          | Estimate  |
|                             | 15253/0.2392 | 63800     |
| MSM Online                  |              |           |
| Site/App                    | Facebook     | 18200     |
|                             | Grindr       | 51700     |

**CONCLUSION:** We estimated the MSM population to be between 18,000 and 64,000 using multiple local data sources. Based on the US CDC estimate that MSM comprise between 2.8% and 5.3% of the US male population we would expect approximately 60,000 MSM in metro Vancouver, consistent with our range of estimates.

### EPH03

#### PREDICTORS OF MORTALITY AMONG A SAMPLE OF HARDER-TO-REACH INDIVIDUALS LIVING WITH HIV

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<sup>1</sup>Burnaby; <sup>2</sup>Vancouver, BC

**BACKGROUND:** The advent of highly active antiretroviral therapy (HAART) has dramatically improved health outcomes for people living with HIV/AIDS (PHA). However, certain populations continue to experience higher rates of co-morbidities, poorer HIV-related health outcomes and increased mortality, even within a context of universal health care. This study aims to identify correlates of mortality among a sample of harder-to-reach PHA in British Columbia (BC), Canada.

**METHODS:** Cross-sectional socio-demographic, behavioural and service utilization data from the Longitudinal Investigations into Supportive and Ancillary Health Services (LISA) study were utilized for this analysis. The LISA study is comprised of 1000 harder-to-reach PHA in BC who completed a comprehensive interviewer-administered survey between July 2007 and January 2010. Survey data has been linked to clinical data obtained from the provincial Drug Treatment Program at the BC Centre for Excellence in HIV/AIDS. Multivariable logistic regression was used to identify independent correlates of mortality.

**RESULTS:** Between July 2007 and June 2013, 95 (10%) of the 915 LISA participants were confirmed as deceased. Of the 95 cases of mortality, the median age was 48 (IQR: 41-54), 30 (32%) were female, 70 (74%) identified as heterosexual, 35 (37%) identified as Aboriginal, and 34 (36%) reported injection drug use at the time of interview. In the multivariable analysis, individuals who did not complete high school (AOR=1.746, 95% CI: 1.056-2.88), had annual income of less than \$15,000 (AOR=2.873, 95% CI: 1.551-5.323), and had been incarcerated in the 6 months prior to the survey (AOR=2.397, 95% CI: 1.376-4.176) had a higher odds of mortality. Moreover, individuals who did not achieve optimal HAART adherence ( $\geq 95\%$ ) (AOR= 1.884, 95% CI: 1.179-3.010), those who were not virally suppressed (defined as  $<50$  copies/mL) (AOR=3.961, 95% CI: 1.525-10.287), and older individuals (AOR=1.073, 95% CI: 1.043-1.104) had a higher odds of mortality.

**CONCLUSION:** Individuals who reported lower education, less income, recent history of incarceration and poorer clinical characteristics

have a higher likelihood of mortality, demonstrating significant gaps in care for harder-to-reach individuals.

## Epidemiology and Public Health: Economic Evaluation of Policies, Programs or Interventions

## Épidémiologie et santé publique : Évaluation économique des politiques, des programmes ou des interventions

### EPH04

#### UTILITY ANALYSIS OF PERCEIVED WOMEN-CENTRED HIV CARE IN CANADA

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**BACKGROUND:** There is limited research on what constitutes women-centred HIV care and how it affects health status of women living with HIV. We measured differences in health utilities in women who perceived their HIV clinic as women-centred care (WCC) compared to those who did not (non-WCC). Ranging from 0 to 1, the utility values represent preference for a particular health state that is between worst health state (i.e., death, denoted by 0) and perfect health (denoted by 1). **METHODS:** Women with HIV aged 16 or older were enrolled in the Canadian HIV Women's Sexual and Reproductive Health cohort study (CHIWOS) in British Columbia (BC), Ontario (ON), and Quebec (QC). Using a 5-point Likert scale, participants rated whether they perceived the care they received from their HIV clinic in the past year as women-centred. Health-related quality of life was measured using the Short Form-12 (SF-12), classified and converted into utilities using preference weights generated via standard gamble. Utilities and covariates between WCC and non-WCC were compared using t-test or chi-square test.

**RESULTS:** 995 women were included in this analysis with a median age of 44 years (IQR: 36-51). Overall, 54% perceived their HIV clinic as women centred. The WCC group had a significantly higher mean utility value (0.64) compared to the non-WCC group (0.62,  $p<0.01$ ), generating an absolute difference of 0.02. While some authors argue that utility values should have a minimum difference of 0.03, others propose that incremental cost per quality-adjust-life-years (QALY) is more important than the improvement in utility values alone.

**CONCLUSION:** Women-centred care can have a meaningful and positive effect on patients' health. To better inform resource allocation decisions, these findings will be used to generate QALYs alongside measurement of costs, as part of a cost-utility analysis of health services use by women with HIV.

## Epidemiology and Public Health: Epidemiology and Surveillance of HIV Co-infections

## Épidémiologie et santé publique : Épidémiologie et surveillance des coinfections au VIH

### EPH05

#### “THE CANGO LYEC PROJECT – HEALING THE ELEPHANT”: THE IMPACT OF SYPHILIS ON HIV VULNERABILITY IN OF POST-CONFLICT POPULATIONS OF NORTHERN UGANDA

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**BACKGROUND:** The civil war in Northern Uganda resulted in countless deaths, child abductions, and the displacement of the majority of the population. In the aftermath of the war, conditions are ripe for the spread of HIV and other STIs and HIV epidemiological data are scarce. This prospective cohort study affords a unique opportunity to assess other STIs in post conflict Northern Uganda.

**METHODS:** “The Cango Lye Project” is a prospective cohort of conflict-affected populations in three districts of Northern Uganda. Participants completed sociodemographic surveys, mental health screening tools (HTQ, HSCL), and provided blood samples for HIV and syphilis testing. Syphilis serology (RPR with TPHA confirmation) was conducted at each study visit, and seropositive participants were treated. Gender stratified multivariable logistic regressions examined the relationship between syphilis and HIV infection and vulnerability.

**RESULTS:** Of 2388 participants, 792 men (80.0%) and 1163 women (83.2%) were sexually active and included in the analysis. Overall prevalence of syphilis for men (3.91%) and women (4.82%). The highest prevalence of active syphilis was in Amuru district (5.7%), and the highest prevalence was 10.99% in one rural community. Syphilis was significantly associated with HIV in both men (Odds Ratio [OR]: 2.97; 95% Confidence Interval [CI]: 1.15-6.82) and women (OR: 2.88; 95% CI: 1.60-5.04). Among women, syphilis was also associated with a history of abduction (OR: 2.04; 95% CI: 1.16-3.51), depression (OR: 1.80; 95% CI: 1.00-3.16), being >30 years of age (OR: 1.99; 95% CI: 1.16-3.46), and more lifetime sexual partners (OR: 1.84; 95% CI: 1.07-3.18). Multivariate models included women only due to sample size. Adjusted factors associated with syphilis among women included: HIV infection (AOR: 2.75; 95% CI: 1.53-4.83) and a history of abduction (OR: 1.92; 95% CI: 1.09-3.33).

**DISCUSSION:** Women are disproportionately impacted by both HIV infection and syphilis in this post conflict-affected population. Trauma informed HIV and STI care is urgently needed in this population.

### EPH06

#### RISK FACTORS FOR CHLAMYDIA AND GONORRHEA DIAGNOSIS AMONG MEN WHO HAVE SEX WITH MEN IN HIV CARE IN ONTARIO

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**BACKGROUND:** We have previously documented that there is a notable burden of chlamydia and gonorrhea infection among HIV-positive men who have sex with men (MSM) in Ontario. We report behavioural risk factors for chlamydia or gonorrhea diagnosis.

**METHODS:** The OHTN Cohort Study follows people in HIV care across Ontario. We restricted the analysis to 1997 MSM completing annual questionnaires in 2010-2013 attending one of seven clinics that submit all chla-

mydia/gonorrhea tests to the provincial public health laboratory; we obtained test results via record linkage. Results are reported as hazards ratios with 95% confidence intervals from Cox regressions with time-updated covariates.

**RESULTS:** On average, men were followed for 2.5 years. At baseline, mean age was 48 years, 82% were on ART, and 79% had an undetectable viral load; median years since HIV diagnosis was 17 years. In total, 2.1% (41) and 2.3% (46) had at least one new diagnosis of chlamydia and gonorrhea, respectively. Risk factors are shown below (Table). We observed lack of a protective effect of condom use regardless of partners' HIV status.

**CONCLUSIONS:** Although new diagnoses were most likely among men reporting anal sex, they still occurred among sexually active men who did not, and there was little evidence of condom protection. Transmission may have occurred via non-intercourse activities. Heightened risk for recreational drug use and multiple HIV-positive partners suggests that chlamydia/gonorrhea may have achieved high prevalence in certain sexual networks among HIV-positive MSM, which may have low connectedness with networks among HIV-negative MSM.

#### Time-updated risk factors for chlamydia/gonorrhea diagnosis among HIV-positive MSM attending selected clinics of the OHTN Cohort Study, 2010-13.

|  | Unadjusted HR    | Adjusted HR      |
|--|------------------|------------------|
| Number of HIV+ partners, past 3 months           |                  |                  |
| None   | Reference        | Reference        |
| One  | 2.3 (1.1, 4.7)   | 0.6 (0.2, 1.6)   |
| 2-4  | 5.0 (2.7, 9.4)   | 1.2 (0.5, 2.9)   |
| 5 or more  | 13.5 (7.1, 25.5) | 2.6 (1.0, 6.5)   |
| Number of HIV- / unknown partners, past 3 months |                  |                  |
| None   | Reference        | Reference        |
| One  | 1.0 (0.5, 2.0)   | 0.5 (0.2, 1.1)   |
| 2-4  | 2.2 (1.2, 4.3)   | 0.7 (0.4, 1.6)   |
| 5 or more  | 3.5 (1.9, 6.2)   | 0.8 (0.4, 1.7)   |
| Anal sex, past 3 months                          |                  |                  |
| No partner                                       | Reference        | Reference        |
| Sexually active but no anal sex                  | 1.9 (0.5, 6.9)   | 2.1 (0.4, 10.0)  |
| Anal sex always with a condom                    | 7.0 (2.5, 19.0)  | 11.8 (3.1, 45.3) |
| Any condomless anal sex                          | 12.9 (5.1, 32.6) | 9.7 (2.4, 39.0)  |
| Recreational drug use, past 6 months             |                  |                  |
| No   | Reference        | Reference        |
| Yes  | 5.0 (3.1, 7.9)   | 2.0 (1.7, 3.6)   |

Adjusted for all variables shown + age, viral load and region.

### EPH08

#### HIV AND HCV INFECTION AMONG INJECTION DRUG USERS IN THE SURVUDI NETWORK – 1995 TO 2014

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**OBJECTIVES:** To estimate HIV and HCV prevalence among injection drug users (IDUs) in the SurvUDI network and to examine trends in HIV and HCV incidence and use of syringes previously used by someone else (“used syringes”).

**METHODS:** Since 1995, IDUs having injected recently (past 6 months) are recruited in harm reduction and health programs across Québec and in Ottawa. Participants provide informed consent, complete an interviewer-administered questionnaire and give saliva samples for antibody testing (anti-HIV: since 1995; anti-HCV: retrospectively for 1997-2003 and prospectively since). Through a unique identifier, multiple visits by a same IDU (repeater) are linked and incidence measured. The bootstrap method was used for trend analyses.

**RESULTS:** As of March 31, 2014, 13694 IDUs had completed 25899 interviews. Overall, 75.7% were males with a median age of 36 years (females: 29 years). At baseline (2009-2014), 72.2% had recently injected cocaine and 62.7% had recently injected prescription opioids. HIV prevalence (2003-2014) and incidence (1995-2014) were 14.2% [95% Confidence Interval (95% CI): 13.4-15.1%] and 2.2 per 100 person-years (PY) [95% CI: 1.9-2.4 per 100 PY; 319 seroconversions among 3443 repeaters initially HIV-negative]. HCV prevalence (2003-2014) and incidence (1997-2014) were 62.9% [95% CI: 61.7-64.1%] and 22.2 per 100 PY [95% CI: 20.3-24.1 per 100 PY; 531 seroconversions among 1141 repeaters initially HCV-negative]. HIV/HCV co-infection rate was 12.1% (2003-2014). Recent use of "used syringes" decreased significantly from 1995 to 2013 (43.4% to 16.8%;  $p<0.001$ ). HIV incidence decreased significantly between 1995 and 2012 (5.1 to 0.9 per 100 PY  $p<0.001$ ). HCV incidence decreased significantly between 1998 and 2012 (22.1 to 18.5 per 100 PY;  $p=0.0033$ ).

**CONCLUSIONS:** Despite encouraging decreases in HIV incidence and use of "used syringes" and a slight decrease in HCV incidence, all remain unacceptably high. Epidemiological surveillance of that population continues to be essential to further develop and strengthen appropriate harm reduction programs.

## EPH09

### HIV/HCV PREVALENCE AND RELATED RISK FACTORS AMONG PRISONERS OF THE QUEBEC CITY AND BAIE-COMEAU PROVINCIAL DETENTION CENTRES: COMPARING CROSS-SECTIONAL DATA FROM 2003 AND 2014

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**OBJECTIVES:** To compare HIV and HCV prevalence as well as related risk factors among inmates in the Quebec City and Baie-Comeau detention centres as measured in a cross-sectional study in 2014 to those estimated in a similar study in 2003.

**METHODS:** Cross-sectional data were obtained from male and female prisoners. Risk factors were assessed through a self-administrated questionnaire and HIV/HCV antibodies were detected using saliva samples.

**RESULTS:** HIV prevalence was lower in 2014 than in 2003 among both men (1.4% vs. 1.6%) and women (1.5% vs. 6.0%), however the difference was not significant. HCV prevalence was also lower in 2014 than in 2003 for men (12.8% vs. 16.8%) and women (17.9% vs. 28.8%), but only significant for the whole sample (13.4% vs. 18.6%,  $p=0.02$ ). Table 1 compares some of the reported risk factors between 2014 and 2003. The proportion of male IDUs outside prison was lower in 2014 than 2003 (23.5% vs. 29.9%,  $p=0.04$ ). Although only borderline significant, an even greater difference was observed in female IDUs outside prison (25.4% vs. 40.9%). Tattooing was still very frequent, but practiced much less often with non-sterile equipment in 2014 compared to 2003. Male sex work, both outside and inside prison, was also less frequent in 2014 than in 2003.

**CONCLUSION:** Declines in HIV/HCV prevalence could be related to a decreasing proportion of IDUs in the inmate population. Tattooing practices were much safer in 2014 compared to 2003. The role of male sex work on HIV/HCV epidemiology among male inmates remains unclear.

| Behaviour                           | Men, %          |                 |         | Women, %       |                |         |
|-------------------------------------|-----------------|-----------------|---------|----------------|----------------|---------|
|                                     | 2003<br>(n=381) | 2014<br>(n=502) | p-value | 2003<br>(n=66) | 2014<br>(n=64) | p-value |
| <b>Outside prison</b>               |                 |                 |         |                |                |         |
| Injection drug use                  | 29.9            | 23.5            | 0.037   | 40.9           | 25.4           | 0.067   |
| Needle sharing, ever*               | 45.6            | 50.0            | 0.51    | 65.4           | 58.8           | 0.75    |
| Snorting drugs                      | 81.4            | 83.7            | 0.37    | 80.3           | 82.1           | 0.83    |
| Tattooing, receipt of               | 50.4            | 51.6            | 0.73    | 57.6           | 71.6           | 0.1     |
| With non-sterile equipment, ever*   | 75.9            | 6.9             | 0.0001  | 32.4           | 10.4           | 0.015   |
| Sex with IDU                        | 27.9            | 22.5            | 0.064   | 39.4           | 41.8           | 0.74    |
| Oral sex for money of drugs         | 8.1             | 2.6             | 0.0002  | 37.9           | 32.8           | 0.59    |
| Anal/vaginal sex for money or drugs | 5.5             | 0.8             | <0.0001 | 31.8           | 34.3           | 0.85    |

## Inside prison

|                                   |      |      |       |      |       |      |
|-----------------------------------|------|------|-------|------|-------|------|
| Injection drug use                | 3.0  | 1.4  | 0.15  | 0    | 1.5   | -    |
| Needle sharing, ever*             | 72.7 | 57.1 | 0.63  | -    | 100.0 | -    |
| Snorting drugs                    | 28.1 | 32.5 | 0.18  | 19.7 | 25.4  | 0.53 |
| Tattooing, receipt of             | 43.8 | 42   | 0.63  | 4.5  | 4.5   | 1    |
| With non-sterile equipment, ever* | 18.2 | 11.8 | 0.11  | 66.7 | 0.0   | 0.4  |
| Anal sex with men                 | 2.1  | 1.0  | 0.26  | NA   | NA    | NA   |
| Sex for money or drugs            | 2.1  | 0.4  | 0.024 | 0    | 0     | -    |

\*Among subjects who reported the behaviour on the previous line

NA = not asked

## Epidemiology and Public Health: Epidemiology and Surveillance of HIV/AIDS

## Épidémiologie et santé publique : Épidémiologie et surveillance du VIH/sida

## EPH10

### GEOGRAPHIC ORIGINS OF HIV+ MOTHERS GIVING BIRTH IN CANADA (1990-2013)

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<sup>5</sup>Edmonton, AB

**OBJECTIVES:** To describe geographic origin trends of HIV+ mother-infant pairs (MIP) in Canada from 1990 to 2013.

**METHODS:** Data collected annually from 22 pediatric and HIV centres participating in the Canadian Perinatal HIV Surveillance Program were reviewed including: maternal country of origin and clinical characteristics, antiretroviral usage and infant outcome.

**RESULTS:** Among 3877 MIP from 1990-2013, 2089 (53.9%) mothers were foreign-born (FBM). Of 1481 (70.9%) African-born mothers, 30.7%, 20.1%, 17.7%, and 16.7% came from East, Central, Horn, and West Africa, respectively. Most mothers in Western Canada (971/1456, 66.7%) were Canadian-born, whereas FBM predominated in Ontario (945/1357, 69.6%; greatest proportion East African, 25.0%) and Quebec (713/1020, 69.9%; greatest proportion Caribbean, 36.2%). By individual country, the largest numbers of FBM originated from Haiti (261), Ethiopia (181), Congo (146), Zimbabwe (113), Nigeria (96), Burundi (89), Rwanda (82), and Sudan (81). Distribution of countries of origin changed over time; in the pre-cART era (1990-1996), Haiti contributed 29.9% (90/301) of FBM but this decreased to 13.0% (119/918) from 1997-2007, and 6.6% (52/782) in 2008-2013. Since 2008, Ethiopia (80/782, 10.2%), Congo (64/782, 8.2%), and Nigeria (62/782, 7.9%) predominated. The proportion of FBM diagnosed during/after pregnancy decreased from 84% (136/162) overall, 87.3% (55/63) from Africa, and 87.8% (72/82) from Haiti in the pre-cART era to 10.5% (82/778), 9.6% (58/606), and 11.5% (6/52) in 2008-2013. Of the 300 HIV-infected children with FBM, the greatest numbers came from Haiti (48, 16%), Ethiopia (33, 11%), Burundi (30, 10%), Congo (15, 5%), Rwanda (13, 4.3%), Jamaica (12, 4%), Zimbabwe (12, 4%) and Somalia (11, 3.7%).

**CONCLUSIONS:** Geographic origins of HIV+ FBM in Canada have changed over time, with a shift from predominantly Haitian in the pre-cART era to predominantly African more recently. Understanding cultural background and potential obstetrical/pediatric health issues associated with country of origin is important in providing optimal care.



## EPH11

## CANADIAN PERINATAL HIV SURVEILLANCE PROGRAM (CPHSP): ANALYSIS OF TRENDS IN PERINATAL HIV TRANSMISSION, TREATMENT IN PREGNANCY AND DEMOGRAPHICS IN CANADA, 2013

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**OBJECTIVES:** To describe demographics of mother-infant pairs (MIP), treatment during pregnancy and vertical transmission (VT) rates in the Canadian perinatal HIV surveillance cohort of births to HIV+ mothers from 1990 to 2013.

**METHODS:** Maternal and infant data are collected yearly from 22 Canadian HIV centres. VT rates are obtained from the prospective cohort defined as MIP delivered in Canada and identified within 3 months after birth. Data collected include maternal characteristics, antiretroviral therapy (ART) given, and infant outcome.

**RESULTS:** Of 200 identified HIV-positive women giving birth in Canada in 2013, 76% had acquired HIV heterosexually, 17% through injection drug use (IDU) and 2% perinatally; 53% of mothers were black and 23% were aboriginal. 37% of MIP were identified in Ontario, 19% in Alberta, 18% in Québec, 11% in Saskatchewan, 9% in BC and 7% in Manitoba. The proportion untreated has steadily decreased from 20.3% in 1997 to 3.0% in 2013. Aboriginal women (7%) continued to have a higher proportion untreated in 2013, although this has decreased from 2005-2009 when non-treatment was consistently above 20%. A similar trend in improvement in non-treatment (3%) was seen in IDU. Among 2914 MIP in the prospective cohort in the combination ART (cART) era (1997-2013), the overall VT rate was 2.1% but only 0.7% in MIP receiving antenatal cART and 0.1% in women receiving >4 weeks of antenatal cART. In 2013, seven (3.5%) women either had no antenatal cART or suboptimal treatment, the lowest annual number and percentage in the cART era. Two children were infected perinatally in 2013, one of whom was identified after 3 months of age.

**CONCLUSIONS:** Continued improvement in treatment access for pregnant HIV+ women was seen but perinatal transmission continues to occur. Aboriginal women remain at greater risk of inadequate treatment and risk of vertical transmission to their infants.

## EPH12

## VALIDATING SELF-REPORT OF UNDETECTABLE VIRAL LOAD AGAINST LABORATORY PLASMA VIRAL LOAD MEASURES IN A MULTI-SITE COHORT OF WOMEN LIVING WITH HIV IN BRITISH COLUMBIA

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**BACKGROUND:** Treatment as Prevention (TasP) aims to reduce HIV burden by achieving viral suppression in people with HIV. Without laboratory data measuring viral load (VL), observational studies rely on self-report in questionnaires but the accuracy remains unclear. We assessed the validity of a self-reported measure of undetectable VL to assess viral suppression among women living with HIV (WLHIV).

**METHODS:** We used linked questionnaire and laboratory data from WLHIV (≥16 years) in BC enrolled in the Canadian HIV Women's Sexual and Reproductive Health Cohort Study (CHIWOS) and the BC Centre for Excellence in HIV/AIDS (a population-based registry capturing 100% of VL data in BC). Self-reported undetectable VL was assessed by the question: "What was your most recent VL, undetectable (i.e. below 50 copies/mL) or detectable (i.e. over 50 copies/mL)?" Laboratory measurements of VL <50 copies/mL (closest to/before study visit) were the criterion for validity analyses. We measured positive and negative predictive values (PPV, NPV) of self-reported undetectable VL.

**RESULTS:** Questionnaire data were linked to laboratory data for 99.7% of participants (n=285); 13 were excluded due to missing self-report data. Median age was 45 (IQR: 37-51). 47% identified as Aboriginal, 36% Caucasian, and 6% African, Caribbean, or Black. 31% and 44% reported recent injection drug use and sex work. 83% were currently on ART and 93% enrolled in HIV care. 84% self-reported having undetectable VL while 82% had laboratory data indicating suppression. Women reporting recent illicit drug use and a current CD4 count <350 cells/mm<sup>3</sup> were significantly less likely to be virally suppressed. PPV of self-reported undetectable VL was 94% (95% CI: 89-96), showing 94% of women who self-reported being undetectable truly were. NPV was 81% (67-92), showing 81% of women who self-reported being detectable truly were.

**CONCLUSIONS:** A brief and simple self-reported measure assessing undetectable VL strongly predicted true viral suppression among a cohort of WLHIV in BC with a high prevalence of laboratory-confirmed viral suppression. This measure can be used in research settings without laboratory data to assess TasP-related goals.

## EPH13

## TEMPORAL CHANGES IN THE DEMOGRAPHIC PROFILE AND VIROLOGIC RESPONSES TO ANTIRETROVIRAL THERAPY IN CANADA'S LARGEST MULTISITE OBSERVATIONAL HIV COHORT

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**BACKGROUND:** We sought to describe temporal changes in the demographic and clinical profile of HIV-positive individuals initiating combination antiretroviral therapy (cART) in Canada from 2000-2011.

**METHODS:** Participants of the Canadian Observational Cohort (CANOC) collaboration, a multisite cohort of HIV-positive individuals aged ≥18 years and initiating cART naively after 2000 in BC, Ontario, and Quebec, were included. Participants with <12 months of follow-up were excluded. Participants were grouped by era of cART initiation (2000-2002, 2003-2005, 2006-2008, 2009-2011). Demographic and clinical characteristics were compared by era using Pearson's  $\chi^2$  and Wilcoxon rank-sum tests. Cox proportional hazards models were used to estimate the effect of calendar period of cART initiation on virologic responses to cART, including time to viral load suppression (2 measures <50 copies/mL at least 30 days apart) and rebound (2 measures >200 copies/mL at least 30 days apart, after suppression).

**RESULTS:** Of 8006 participants, 1453 (18%) were female, 46% lived in BC, 33% in Ontario, and 19% in Quebec. The median baseline age at treatment initiation was 38 (IQR=33-45) in 2000-2002, compared to 40 (IQR=32-47) in 2009-2011 ( $p<0.001$ ). The proportion of participants with IDU history decreased from 26% in 2000-2002 to 19% in 2009-2011 ( $p<0.001$ ). After adjustments for age, sex, province, transmission risk category, Aboriginal ancestry, baseline CD4 count, baseline viral load, baseline third ARV class, and viral load testing rate, participants initiating cART in 2003-2005, 2006-2008, and 2009-2011 were more likely to achieve viral suppression than those in 2000-2002 (aHR=1.16 [95% CI=1.07-1.25], aHR=1.22 [95% CI=1.10-1.34], aHR=1.14 [95% CI=1.01-1.26], respectively). After adjusting for the same confounders, participants initiating cART in the later eras were significantly less likely to experience viral rebound than in 2000-2002 (aHR=0.68 [95% CI=0.59-0.79], aHR=0.54 [95% CI=0.43-0.67], aHR=0.31 [95% CI=0.23-0.42], respectively).

**CONCLUSIONS:** Notable temporal changes in the demographic profile and improvements in virologic response to cART are evident among CANOC participants. Characterizing the demographic and clinical profile of people living with HIV supports the optimal delivery of clinical care for the evolving Canadian HIV epidemic.

## EPH14

## STRUCTURAL DETERMINANTS OF DUAL CONTRACEPTIVE USE AMONG FEMALE SEX WORKERS IN CONFLICT-AFFECTED GULU, NORTHERN UGANDA

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**OBJECTIVES:** Globally, sex workers face disproportionate health and social inequities, with those in sub-Saharan Africa facing a particularly high burden of HIV. While global evidence has shown that structural determinants (e.g., laws and policies, work environment, armed conflict, migration patterns) shape sex workers' ability to protect themselves from HIV and other harms, there remains a paucity of data regarding access to contraception among sex workers in sub-Saharan Africa. The object of this analysis was to explore the structural determinants of dual contraceptive use (i.e., use of non-barrier contraceptives and male condoms for pregnancy prevention) amongst female sex workers in Gulu, northern Uganda.

**METHODS:** We draw on questionnaire data from a cross-sectional study conducted in Gulu, northern Uganda from 2011-2012. Participants were recruited through extensive peer/sex worker and community-led outreach. We used logistic regression to assess correlates of dual contraceptive use, defined as the combined use of non-barrier contraceptives and male condoms for pregnancy prevention.

**RESULTS:** Among 400 female sex workers, 180 (45%) used dual contraceptives. Multivariable modeling revealed that older age (Adjusted odds ratio (AOR): 1.10; 95% Confidence Interval (CI): 1.04-1.15), prior unintended pregnancy (AOR 1.53; 95% CI, 1.01-2.34), and prior HIV testing (AOR 5.22; 95% CI: 1.75-15.57) significantly increased the odds of dual contraceptive use, whereas having to rush sexual negotiations due to police presence (OR 0.65; CI, 0.42-0.99) was negatively associated with dual contraceptive use.

**CONCLUSION:** This analysis has shown the utility of HIV testing as a critical entry point for sex workers to access sexual and reproductive health (SRH) care. However, the criminalization of sex work and limited access to safer work environments continues to undermine existing SRH programming for sex workers. There is an urgent need for rights-based programming and integration of sexual and reproductive health into HIV prevention and care programs for sex workers.

## EPH15

## QUANTIFYING THE HIV CARE CASCADE IN ONTARIO: CHALLENGES AND FUTURE DIRECTIONS

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**BACKGROUND:** The HIV care "cascade" is a framework that depicts the degree to which people infected with HIV are diagnosed in a timely fashion, become engaged in HIV care, and ultimately are successfully treated with antiretrovirals (ART). Many jurisdictions are seeking to monitor the cascade to target and prioritize HIV testing, linkage to care, and ART support interventions. We aimed to quantify the cascade using existing data and recommend future directions for ongoing cascade monitoring in Ontario.

**METHODS:** We identified existing data sources to derive high and low estimates for 4 indicators among all Ontarians with HIV: the proportions diagnosed, linked to care, retained in care ( $\geq 2$  viral loads per year), and with undetectable viral load. These included published population-based estimates from the Public Health Agency of Canada (values for 2011) and the Ontario HIV Epidemiological Monitoring Unit (values between 2007 and 2011); and unpublished estimates from the OHTN Cohort Study (values for 2012), a multi-site clinical cohort of persons in specialty HIV care.

**RESULTS:** High and low estimates for each indicator of the HIV care cascade are shown in the Table.

|               | Percentage infected with HIV | Percentage diagnosed | Percentage linked to care | Percentage retained in care | Percentage with Undetectable Viral Load |
|---------------|------------------------------|----------------------|---------------------------|-----------------------------|---|
| Low Estimate  | 100                          | 65                   | 52                        | 43                          | 27                                      |
| High Estimate | 100                          | 75                   | 65                        | 55                          | 40                                      |

**CONCLUSIONS:** Using existing information, populating the cascade for Ontario was possible with similar estimates for percentage undetectable compared to other North American jurisdictions. Estimates were challenged by varying years for published estimates. Updated estimates of the proportion diagnosed are urgently needed for Ontario as this parameter has the most uncertainty and the greatest influence. Revised Ontario-based mathematical models and linked population-based data sources for empirical estimates would be ideal and should be the focus for future monitoring.

## EPH16

## ASSESSING THE NEED FOR SUPERVISED INJECTION SERVICES AMONGST A POPULATION OF SOCIALLY MARGINALIZED PEOPLE WHO INJECT DRUGS IN EDMONTON

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Edmonton, AB

**BACKGROUND:** Supervised injection services (SIS) are an important means for preventing HIV-related risk behaviours and overdose mortality amongst people who inject drugs (PWID). However, in Canada scale-up of this public health intervention has been slow due to consistent political opposition at the federal level. The Respect for Communities Act (recently passed by the House of Commons and expected to become law in 2015), outlines 26 onerous requirements SIS applicants must satisfy prior to receiving a federal exemption. In particular, the Act requires extensive epidemiological data on illicit drug use in a prospective jurisdiction. In Edmonton (as well as many other mid-sized Canadian cities) these data are not available. The present study was designed to address this gap, inform local SIS discussion and planning, and develop the scientific basis for a potential federal exemption application.

**METHODS:** Adopting a community-based research approach, we conducted the largest-to-date survey of people who use illicit drugs in Edmonton. 324 participants were convenience-sampled from two community agencies with embedded needle exchange sites. Interviewers administered a structured questionnaire measuring illicit substance use, HIV-related risk behaviours and willingness to attend SIS. Descriptive and inferential statistics were used to describe characteristics of the sample.

**RESULTS:** 279 participants reported recent injection drug use. Of these PWID, approximately 80% reported recent public injection; 47% reported difficulty accessing sterile syringes; 29% reported improper syringe disposal; 18% reported syringe sharing; and 22% reported experiencing a nonfatal overdose in the past 6 months. 90% of PWID were willing to attend SIS, if made available in Edmonton.

**CONCLUSION:** Relative to other Canadian jurisdictions, PWID in Edmonton engage in high rates of HIV-related risk behaviours and are at considerable risk for overdose-related morbidity and mortality. Supervised injection services should be made available in Edmonton in an effort to improve health and safety for PWID.

## EPH17

# CHARACTERISTICS AND RATES OF NEWLY INFECTED HIV-POSITIVE GAY, BISEXUAL AND OTHER MEN WHO HAVE SEX WITH MEN (MSM) IN VANCOUVER, BRITISH COLUMBIA: PRELIMINARY FINDINGS OF THE MOMENTUM HEALTH STUDY

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**BACKGROUND:** We measured HIV incidence among participants in a prospective cohort of MSM in Vancouver, British Columbia and explored characteristics that may distinguish new HIV seroconverters from MSM who remained HIV-negative.

**METHODS:** The Momentum Health Study employs respondent-driven sampling to recruit participants into a longitudinal bio-behavioural cohort study with 6-monthly visits. At baseline, all participants completed a computer-assisted questionnaire and nurse-administered sexual health check-up including a point-of-care HIV test. Seroconverters were participants who tested HIV-negative at baseline and HIV-positive at a subsequent study visit or another testing source between visits. Behavioural data are drawn from their most recently completed questionnaire prior to their HIV diagnosis. Comparisons between HIV seroconverters and men who remained HIV-negative were made using non-parametric statistical tests ( $p < 0.05$ ).

**RESULTS:** As of December 7, 2014, 378 MSM who tested HIV-negative at baseline contributed a mean follow-up time of 1.27 years. The HIV incidence rate was 1.25 per 100 person-years (6 MSM seroconverted). Although not significantly different when compared with MSM who remained HIV negative, all seroconverters identified as gay, 5/6 as Caucasian, and 5/6 were aged  $\leq 30$  years. The HIV incidence rate for MSM aged  $\leq 30$  was 2.40 per 100 person-years. Compared with MSM who remained HIV-negative, MSM who seroconverted reported a greater median number of sexual partners in the past six months (15.5 vs 4.0,  $p = 0.01$ ), reported a greater median number of anal sex events with sexual partners in the past six months (47.5 vs 7.0,  $p = 0.02$ ), and felt at high risk for HIV (50.0% vs 8.0%,  $p < 0.01$ ). There were no significant differences in the proportion of participants reporting any condomless anal intercourse, other socio-demographics, substance use patterns, mental health diagnoses, or reported prevention / risk reduction practices.

**CONCLUSIONS:** Recent HIV seroconverters in our study were more likely to be younger MSM with frequent partner change and greater rates of anal intercourse, but appear to understand that they are at higher risk for HIV acquisition. These findings can help target further HIV prevention programs towards such individuals.

## EPH18

# AWARENESS OF POST-EXPOSURE PROPHYLAXIS (PEP) AMONGST GAY AND OTHER MEN WHO HAVE SEX WITH MEN (MSM) IN VANCOUVER, BC

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**BACKGROUND:** Post-Exposure Prophylaxis (PEP) is a strategy to reduce HIV infection in those with high-risk exposure. This study characterized PEP awareness amongst Vancouver MSM.

**METHODS:** Momentum Health Study participants were recruited via respondent driven sampling and completed a self-administered computer-based interview. Multivariable logistic regression identified factors associated with PEP awareness, asked between November 2012 and February 2014.

**RESULTS:** Of 673 participants included in this analysis, 384 (57%) had heard of PEP, a proportion that did not significantly differ over the study period. Of those who had heard of PEP, 32% reported knowing "not much, or nothing at all" about PEP, 59% "a bit in general", and 9% "a lot". 131 reported talking about PEP in last 6 months. Of the 9 participants who had used PEP, 7 identified the BC nPEP pilot program as the source. Factors associated with greater odds of PEP awareness include being White (52%) compared with another racial/ethnic group (17.6%-

42.8%) being a student (AOR=2.09, 95% CI:1.31-3.35),  $\geq 10$  lifetime insertive anal sex partners (AOR=1.81, 95% CI:1.15-2.83), having had any condomless anal intercourse with an unknown or discordant serostatus partner in the past six months (AOR=1.6, 95% CI:1.00-2.43), having been diagnosed with genital warts (AOR=1.76, 95% CI:1.04-2.98), and reporting use of other preventive strategies such as abstaining from anal intercourse (AOR=2.06, 95% CI:1.36-3.11) or sero-sorting for condomless anal intercourse (AOR=1.92, 95% CI:1.27-2.89). PEP aware HIV-positive participants were also more likely to ask their partner's serostatus (AOR=3.86, 95% CI:1.61-9.25). PEP awareness was negatively associated with non-gay sexual orientation (AOR=0.47, 95% CI:0.28-0.81), high school education or less (AOR=0.60, 95% CI:0.38-0.94), higher Sexual Altruism-Personal sub-scale scores (AOR=0.56, 95% CI:0.39-0.79), and lesser agreement with the statement "I always have condoms when having sex" (agree versus strongly agree: AOR=0.47, 95% CI:0.29-0.76).

**CONCLUSION:** PEP awareness is associated with certain behaviours with greater potential for HIV transmission; further research is needed to investigate how best to incorporate this strategy within combination HIV prevention.

## EPH19

# HIV AND HCV TESTING AND TREATMENT AMONG IDUs IN THE SURVUDI NETWORK – 2003 TO 2013

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**OBJECTIVES:** To compare testing, awareness of infection, and treatment (three key indicators along the cascade of HIV and HCV care) across regions and over time among injection drug users (IDUs) in the SurvUDI network.

**METHODS:** Since 1995, IDUs (injection in the past 6 months) are recruited in harm reduction and health programs across Québec and in Ottawa. Participants provide consent, complete a questionnaire and give saliva samples for anti-HIV/anti-HCV antibody testing. Four regions were compared: Montréal, Québec City (QC), Ottawa/Ontario (OO) and semi-urban sites (SUS) and one questionnaire per participant (and per region or period as required) was retained. Wald tests from GEE models were used for comparisons across regions and the bootstrap method for trend analysis.

**RESULTS:** From December 2003 to January 2013, 6,421 IDUs completed 12,146 interviews. Overall, 8.7% of participants were never tested for HIV. This proportion decreased from 2003 to 2013 (10.4% to 4.3%;  $p < 0.001$ ) and varied across regions (Montréal: 7.1%, QC: 8.0%, OO: 10.4%, SUS: 10.2%;  $p < 0.001$ ). Among HIV-infected participants, 19.0% were unaware of their infection. This proportion was similar in all regions ( $p = 0.12$ ) but decreased over time (22.7% to 8.8%;  $p < 0.001$ ). Among those aware of being HIV-infected, 63.3% were currently taking HIV medication. This proportion, similar in all regions ( $p = 0.47$ ), increased over time (60.9% to 81.6%;  $p < 0.001$ ). Regarding HCV, 10.2% were never tested, 20.9% were unaware of having anti-HCV antibodies and, among those knowing, 15.3% had ever taken medication. These proportions respectively decreased, decreased and increased over time.

**CONCLUSIONS:** The three studied indicators improved over the past decade for HIV and HCV. However, many IDUs remain untested and unaware of their infection. HIV treatment seems now more accessible to IDUs, but few have access to HCV treatment. The existing services must be strengthened and new approaches developed to better link infected IDUs to care.

## EPH20

# GENDER DIFFERENCES IN HIV RISK BEHAVIOURS AND PREVALENCE AMONG PEOPLE WHO INJECT DRUGS (PWID) IN ONTARIO

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**BACKGROUND:** Relatively few harm reduction programs focus on gender specific programming. This analysis assesses the extent of gender differences within Ontario PWID in order to consider the need for gender-specific HIV prevention.



**METHODS:** Phase 3 of the I-Track behavioural surveillance surveys sponsored by the Public Health Agency of Canada (PHAC) recruited from needle exchange programs in five Ontario cities between 2010-12 (Kingston, London, Sudbury, Thunder Bay, Toronto). Interviewers administered questionnaires and collected dried blood spot samples using coded linkage to maintain anonymity.

**RESULTS:** A total of 1323 PWID participated – 68.3% male, 37.7% female. Males were more likely to report being under-housed in the previous 6 months (33% vs. 20%,  $p < 0.001$ ). Females were more likely to have borrowed needles (20% vs. 12.2%,  $p = 0.001$ ), and to have lent needles (25.9% vs. 12.7%,  $p < 0.001$ ) in the previous 6 months. 47% of females reported borrowing other injecting equipment vs. 34% of males ( $p < 0.001$ ); 46% of females reported lending other injecting equipment vs. 34% of male respondents ( $p < 0.001$ ). Females were more likely to report borrowing equipment from regular sex partners ( $p < 0.001$ ), while men were more likely to report borrowing equipment from friends ( $p = 0.002$ ) and casual sex partners ( $p = 0.05$ ). Women reported greater frequency of borrowing equipment than men: of the 204 men who reported borrowing equipment, 10% borrowed frequently, and 8% always, while of the 145 women who reported borrowing equipment, 15% borrowed frequently, and 16% always ( $p = 0.03$ ). Men were more likely to have been in jail in their lifetime (89.1% vs. 70.6%,  $p < 0.001$ ), more likely to report injecting while incarcerated (19.6% of those who had been in jail, vs. 10.5% for women,  $p = 0.002$ ), with no significant gender difference in sharing needles/syringes among those who had injected while incarcerated. Being female was independently associated with being HIV+ and with being HCV+ in multivariate analyses.

**CONCLUSION:** There is ample epidemiological evidence of gender specific risks among PWID in Ontario suggesting a need for specific gender focused prevention programming.

## EPH21

### LATE DIAGNOSIS OF HIV INFECTION AMONG REPORTED AIDS CASES IN CANADA

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**OBJECTIVE:** To compare the characteristics of individuals diagnosed with HIV less than 12 months before their AIDS diagnosis to those diagnosed 12 months or more before their AIDS diagnosis.

**METHODS:** AIDS case surveillance data submitted to the PHAC from 1979 to 2013 were included in the analysis. Provinces that do not submit HIV diagnosis date with their AIDS cases were removed from the analysis. Of the remaining, 58.6% of AIDS cases had a valid HIV diagnosis date. Cases were classified as Late HIV Diagnosis (LD) (<12 months between HIV and AIDS diagnosis) or Not-late HIV Diagnosis (NLD) (>12 months). Univariate analyses were done to explore factors associated with LD versus NLD. Factors significantly associated with the outcomes ( $p < 0.05$ ) were examined in a multivariate logistic regression model.

**RESULTS:** Of the 5,304 cases included in the analysis, 38.3% ( $n = 2,033$ ) were classified as LD. In the univariate analysis, sex, age, ethnicity and exposure category were significantly associated with LD. Males had lower odds of LD compared to females (OR: 0.78, 0.67-0.915). Compared to the 20-29 age group, each successive 10-year age group showed an increase in the odds of LD: 30-39 (OR: 2.0, 1.71-2.34), 40-49 (OR: 3.1, 2.60-3.69), 50-59 (OR: 4.7, 3.72-5.96) and 60+ (OR: 6.8, 4.62-9.97). Compared to White ethnicity, all ethnic groups showed significantly higher odds of LD: Black ethnicity (OR: 2.5, 2.11-2.94), Latin American (OR: 3.0, 1.64-5.38), Asian/South Asian/West Asian/Arab (OR: 2.0, 1.15-3.41) and Aboriginal (1.3, 1.00-1.59). Heterosexual contact exposure was associated with LD (OR=2.24, 1.94-2.57 compared to MSM exposure,  $p < 0.0001$ ).

**CONCLUSION:** Late HIV diagnosis limits the benefits of available treatment strategies and reduced risk behaviors. These analyses suggest that women, older persons, ethnic groups other than White, and risk groups such as heterosexuals would benefit from increased awareness of the risk of HIV transmission and improved testing programs.

## Epidemiology and Public Health: Evaluations of Public Health Programs and Interventions

## Épidémiologie et santé publique : Évaluation des programmes et des interventions en santé publique

## EPH22

### HARM REDUCTION FROM THE PERSPECTIVE OF HEALTH CARE PROVIDERS: BENEFITS AND CHALLENGES

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Harm reduction (HR) uses strategies that aim to reduce the secondary consequences associated with risky activities (e.g. substance use), without strictly focusing on cessation of the activity itself. Many HR programs have strong empirical support. As such, there is increasing recognition of the need for the inclusion of HR strategies and services across the continuum of HIV care. However, research and evaluation of HR programs typically focuses on clients' physical health outcomes and utilization of the HR services provided. The primary aim of this study is to expand our understanding of the impact and process of providing care with an HR approach by exploring health care providers' views on the benefits and challenges of implementing HR strategies.

This study surveyed staff at two HIV/AIDS dedicated facilities in Canada (Casey House, Toronto and The Dr. Peter Centre, Vancouver) that implement an HR policy. A 20-question survey was informed by a literature review of HR research and developed by clinicians, researchers and administrators in both cities. The survey included open-ended questions and quantitative rating scales. The survey was administered online (through Fluid Survey™) and in paper format. Sixty-four health care providers (HCP) completed the survey in February and March, 2014. Results indicate that in addition to client physical and mental health as key endpoints when evaluating HR programs, engagement in the health care system and building positive client relationships are positive outcomes strongly valued by HCP. However, HCP highlighted personal and inter-team related challenges experienced while working within an HR framework. Respondents identified the importance of clear procedures and continued HCP support in the implementation of HR programming. The HCP perspective captured in this study has implications for program and staff development.

## EPH23

### USING SOCIAL MEDIA TO SUPPORT INTEGRATED HIV PREVENTION: CONSIDERATIONS FOR RESEARCH AND PRACTICE

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Social media has gained widespread popularity as an HIV prevention tool, in part due to its unique properties: It can support interaction between numerous individuals, and permit users the opportunity to shape their online environment. As such, social media may prove useful in the conduct of integrated HIV prevention interventions in Canada. However there is a lack of information regarding appropriate means of utilizing social media for effective HIV prevention.

Based on the findings of an NCCID-funded scoping review, this paper focuses on examining peer-reviewed research on interventions designed to prevent transmission of HIV and/or STBBIS, and to promote sexual health more broadly. Articles were gathered through iterative searches of PubMed and EBSCOhost, covering 21 databases. Analysis focused on identifying: 1) how social media were used as an intervention platform, 2) how they were used to effect change in knowledge, behavior, attitudes, or social environments, and 3) the evaluative methods and measures employed to measure intervention impact.

Of the 236 articles retrieved, twelve were included for analysis. Most describe the use of Facebook to disseminate HIV prevention information, and/or engage participants in interactive discussions regarding sexual health. Notable patterns were identified regarding the recruitment of participants or promotion of the intervention, and the use of randomized control trial designs. While self-report measures of behavior and attitudinal change were most common, several studies utilized epidemiologic data, Facebook analytics statistics, and qualitative analysis of comments to assess impact.

The results of this scoping review illustrate considerations for developing social media-based interventions, including how target audiences are engaged. Opportunities for integrated HIV prevention interventions are also discussed. Social media based sexual health approaches may be particularly well-suited to community-level interventions that target existing social networks. Further research is needed to examine existing grassroots social media campaigns to identify measurable and effective strategies.

## EPH24

### JACK & JACQUES: USING GOOGLE ANALYTICS TO ASSESS A MOBILE WEBSITE FOR SEXUALLY TRANSMITTED INFECTIONS PREVENTION AND SCREENING AMONG MEN WHO HAVE SEX WITH MEN IN MONTREAL

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**BACKGROUND:** Jack & Jacques (J&J) is a mobile website for the prevention of sexually transmitted infections (STI) developed by AIDS Community Care Montreal in partnership with the Montreal Public Health Department. Users may complete a quiz about sexual behaviours and be provided recommendations regarding HIV and STI testing. Also, information on local resources for prevention information and confidential testing is provided. This analysis describes how J&J is used through Google Analytics (GA) with a view to improve its uptake.

**METHODS:** Information about J&J users' behaviour was tracked using GA. Filters were applied to exclude non-informative sessions (spam and bounced) and to select sessions made from February 1st 2014 to December 8th 2014.

**RESULTS:** Over a 10-month period, 8560 sessions were recorded. Of these, 5.2% were spam, and 71.0% were bounced; 2036 sessions were included in this analysis. Traffic to the site was highly dependent on promotional events. Most sessions were from users in the Montreal area (73.2%) and made using a mobile phone (52.7%). The average session duration was 2.46 minutes. One-time visitors accounted for 1534 sessions and returning visitors for 502. Most sessions were direct traffic (i.e., entering URL, bookmark) (53.9%). Of all sessions, 45.8% trafficked through the quiz or resource page. Of the 690 sessions where the quiz was visited, 76.7% were of duration greater than 30 seconds, a time considered sufficient for completion. By December 8th, 69 people had subscribed for screening reminders via email.

**CONCLUSION:** GA facilitates the examination of a tremendous amount of indicators but is not without limitations. Because it does not distinguish a one-page session from a bounced session, some sessions where only the quiz or the resource page was visited were excluded. The use of customized filters is a necessary step in data cleaning.

## EPH25

### ADAPTATION OF A POSITIVE PREVENTION INTERVENTION "GAY POZ SEX (GPS)" FOR LATINO GAY MEN LIVING WITH HIV IN CANADA

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**BACKGROUND:** Despite high HIV incidence among Latino MSM, Latino gay, bisexual, and other MSM men living with HIV in Canada have few confidential, safe spaces to talk openly about sex, sexual health and HIV disclosure, as they face cultural and language barriers and social isolation. Thus, our objective was to adapt Gay Poz Sex (GPS), an HIV/STI prevention intervention initially developed for English-speaking HIV-positive persons to make it linguistically and culturally appropriate for Spanish-speaking Latino gay men living with HIV in Canada.

**METHODS:** From November 2010 to December 2013, a multiphase process was undertaken to identify an appropriate intervention, adapt the intervention, develop training materials, and test the adapted version. GPS was identified as a pertinent intervention for Latino positive men. Two community members of the Latino gay community were trained as facilitators for GPS. During the training, facilitators made minor revisions to linguistically and culturally adapt each session's content. "GPS Latino" was tested in a group and the adaptation was further informed by pilot qualitative and quantitative data gathering from five Latino gay men living with HIV.

**RESULTS:** Culturally specific adaptation was needed, which included: language translation, introduction of role-play scenarios instead of videos, and more information about HIV and the law. Qualitative assessments during implementation of GPS demonstrated that all 8 sessions of GPS met the objectives in terms of increasing confidence in disclosure and improving self-perceptions of sexual health. Community members who received GPS suggested few changes, which included increasing the number of sessions, number of role-plays of sexually risky situations, and duration of each session.

**CONCLUSION:** GPS needed very few changes as to be adapted for Latino gay men living with HIV in Canada. This is consistent with previous linguistic adaptations of GPS. Testing of GPS in a larger group will help us to identify positive outcomes in terms of sexual well-being.

## EPH26

### MEETING NEEDS OF PLHIV WITH COMPLEX HEALTH ISSUES: THE DR. PETER CENTRE, AN INTEGRATIVE HEALTHCARE SERVICE

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**BACKGROUND:** The Dr. Peter Centre (DPC) is an integrative health service for vulnerable people living with HIV with complex health and psychosocial care needs. This DPC study aims to describe service use and characteristics of DPC clients.

**METHODS:** We administered a quantitative baseline questionnaire covering eight areas to individuals who have been clients of the DPC since 27 February, 2011. Baseline demographic and clinical participant responses were used for this report. Participant enrolment into the baseline survey is ongoing.

**RESULTS:** During the period between February and November 2014, 96 participants completed the DPC Study quantitative baseline survey. Out of 96 respondents, 85% are male, 59% are Caucasian, 46% are heterosexual, 52% have reported ever being incarcerated, and 76% have reported ever being homeless. The median age of clients is 46.5 years. Among DPC clients, 73% reported ever being diagnosed with substance use disorder, 73% reported diagnosis of depression, and 57% reported diagnosis of anxiety. Currently, the percentage of clients on HAART is 91%, while 71% report receiving treatment for various mental health conditions. Out of 34% of clients with current injecting drug use, 27% report current use of the DPC supervised injection site. Common drugs injected by participants include cocaine (61%), heroin (80%), and crystal meth (75%). Several DPC services are heavily utilized among DPC clients. Meals (breakfast and lunch) are ranked as the most important service. Consultation with the nurse practitioner and medication support are also ranked among the top three most important services offered at the DPC.

**CONCLUSIONS:** DPC clients experience a high level of vulnerability due to a multitude of overlapping complex health issues and barriers to health services. Further research will delve into motivations behind service use based on demographic characteristics, social, structural, and behavioral factors.

**EPH27****DEVELOPING A COMPREHENSIVE STRATEGY TO EVALUATE A NOVEL HIV PREVENTION CASE MANAGEMENT PROGRAM IN VANCOUVER, BC****Holliday, Elizabeth; Compton, Miranda; Chittock, Brian; Moran-Bonilla, Laura  
Vancouver, BC**

**BACKGROUND:** HIV in Vancouver is a concentrated epidemic that disproportionately affects members of several communities including Gay, Bisexual and Other Men who have Sex with Men, Youth, Women, Immigrants and Refugees, and Aboriginal People. To more effectively support individuals at risk, Vancouver Coastal Health redesigned disparate outreach services to create a more focused prevention intervention that better addresses the needs of individuals with identified HIV risks, including receipt of nPEP, multiple STI diagnoses, mental health diagnosis and/or addiction issues.

The new prevention case management program intends to:

- Decrease individuals' vulnerability to acquire HIV by addressing structural barriers that impact well-being
- Increase individual resilience and self-efficacy by supporting the identification and achievement of personal development goals while mitigating risk-taking behaviour
- Improve social cohesion by connecting individuals to supportive communities

**OBJECTIVES:** Develop a strategy to evaluate process, outcomes and impact in order to determine program efficacy and scalability.

**METHODS:** We utilize a mixed-methods model that incorporates both quantitative and qualitative analysis. The process evaluation will use focus groups and surveys to assess fidelity to the model and leadership/partnership components. In order to effectively evaluate program outcomes we developed an acuity scale that includes behavioural and structural risk factors that is administered during intake and then at 6 week intervals until discharge. We have also integrated Goal Attainment Scaling to assess achievement of personal development goals. To assess program impact, our Public Health Surveillance Unit will follow two cohorts to monitor HIV incidence over several years.

- Cohort A: Clients who successfully completed the programs
- Cohort B: Clients who do not complete the program

**RESULTS:** There are currently 125 clients enrolled in the program. Preliminary outcome data indicates consistent reduction in acuity among clients who complete the program. The full evaluation will be completed after the program has been operational for a year.

**EPH28****A COMPARATIVE ANALYSIS OF PROVINCIAL/TERRITORIAL HARM REDUCTION POLICY MAKING: AN INNOVATIVE METHODOLOGICAL APPROACH****Hyshka, Elaine<sup>1</sup>; Sinclair, Caitlin<sup>1</sup>; Asbridge, Mark<sup>2</sup>; Belle-Isle, Lynne<sup>3</sup>; Cavalieri, Walter<sup>4</sup>; Dell, Colleen<sup>5</sup>; Hathaway, Andrew<sup>6</sup>; MacPherson, Donald<sup>7</sup>; Pauly, Bernie<sup>8</sup>; Tupper, Kenneth<sup>8</sup>; Wild, TC<sup>1</sup>  
<sup>1</sup>Edmonton, AB; <sup>2</sup>Halifax, NS; <sup>3</sup>Ottawa; <sup>4</sup>Toronto, ON; <sup>5</sup>Saskatoon, SK; <sup>6</sup>Guelph, ON; <sup>7</sup>Vancouver; <sup>8</sup>Victoria, BC**

Scientific evidence indicates that harm reduction services prevent the spread of HIV/AIDS and other diseases, reduce the risk of overdose death, and connect people who use illicit drugs to addiction treatment and other health and social services. Under an instrumental-rational view of health policy making, a large evidence base supporting the cost-effectiveness of harm reduction interventions should translate into unproblematic policy support for the uptake of this approach as a routine component of health services. However, Canadian provinces and territories exhibit wide variability with respect to implementation of these services, and the approach remains highly contentious. Unfortunately, little research to date has explored factors that underlie the diversity of these services across Canada.

To address this gap we have assembled a team of academics and national and provincial-level knowledge users to implement a mixed-method, multiple case, policy analysis study. Drawing on four provincial/territorial data sources: policy documents, media articles, key informant interviews, and a national public opinion survey we will 1) systematically document and compare the strength of each province and territory's harm reduction policy framework (including funding commitments, governance struc-

tures, etc.) and 2) explore relationships between the comprehensiveness of these policy frameworks and the way media, stakeholders, and the public frame these services.

Funding for this project has been secured and implementation is underway. This presentation will describe our novel methodology and introduce this project to potential key informants and additional interested knowledge users. Our findings are expected to contribute to academic scholarship on contentious health interventions for socially marginalized target populations, and will generate timely data to assist knowledge users in their efforts to advocate for equitable evidence-based policy supporting the expansion of harm reduction services across Canada.

**EPH29****THE CEDAR PROJECT MHEALTH STUDY: EXPLORING THE FEASIBILITY AND ACCEPTABILITY OF AN MHEALTH INTERVENTION FOR HIV TREATMENT AND PREVENTION AMONG YOUNG ABORIGINAL PEOPLE WHO USE ILLICIT DRUGS****Jongbloed, Kate<sup>1</sup>; Friedman, Anton<sup>1,2</sup>; Pearce, Margo E<sup>1</sup>; Demerai, Lou<sup>1</sup>; Thomas, Vicky<sup>2,3</sup>; Schechter, Martin T<sup>1</sup>; Lester, Richard<sup>1</sup>; Spittal, Patricia M<sup>1</sup>; For The Cedar Project Partnership<sup>1</sup>****<sup>1</sup>Vancouver; <sup>2</sup>Prince George, BC; <sup>3</sup>BC**

Despite successes in preventing and treating HIV infection in British Columbia in recent years, young Aboriginal people continue to face disproportionately higher risk of infection, HIV-related mortality and challenges accessing ART treatment. Disparities in rates of infection and access to treatment between Aboriginal and non-Aboriginal people remain among people who use injection drugs.

Since 2003, The Cedar Project has investigated HIV and HCV vulnerabilities among young Aboriginal people who use drugs in British Columbia. The Cedar Project mHealth study was initiated to explore whether the WeTel mHealth intervention, shown effective in improving HIV health outcomes in Sub-Saharan Africa, has the potential to improve HIV prevention and treatment among young Aboriginal people who use illicit drugs. Initial cross-sectional surveys were conducted to understand current mobile phone use patterns and interest in an mHealth program among Cedar Project participants.

Of 82 participants who responded to an initial feasibility survey, 43 (52%) do not currently own a phone. Of these, 8 people shared a mobile phone with someone else, including a family member or regular partner. Twenty-seven (69%) participants with phones reported using the Internet on their devices. A majority of people surveyed (95%) felt that using a mobile phone for health would be helpful to them. Commonly cited reasons for wanting the mHealth intervention include increased safety, access to services, and connection with family. Three participants had concerns about using a mobile phone for their health, including challenges with technology and privacy concerns.

Lack of access to phones among young Aboriginal people who use drugs in Vancouver and Prince George, British Columbia is a key obstacle in initiating an mHealth intervention focused on improving HIV prevention and treatment. However, young people are eager to have access to this technology as a means to improve their health.

**EPH30****RESPONDING TO THE NEEDS OF PEOPLE LIVING WITH HIV IN COLOMBIA: LESSONS LEARNED FROM THE ADAPTATION OF A POSITIVE PREVENTION INTERVENTION****Montano, David<sup>1</sup>; Correa, Diego<sup>1</sup>; Alvarado, Beatriz<sup>2</sup>; Cubillos, Miguel<sup>2</sup>; Galindo, Jaime<sup>1</sup>; Martinez, Jorge L<sup>2</sup>; Adam, Barry<sup>3</sup>; Hart, Trevor<sup>4</sup>****<sup>1</sup>Cali, Colombia; <sup>2</sup>Kingston; <sup>3</sup>Windsor; <sup>4</sup>Toronto, ON**

**BACKGROUND:** To respond to the lack of HIV prevention interventions for positive gay men in Colombia, we sought to further adapt a positive prevention intervention already adapted for positive Latino gay men living in Canada.

**METHODS:** During March 2014, the Spanish language version of Gay Poz Sex (GPS) was adapted and tested using pilot qualitative and



quantitative data gathered from 5 gay men living with HIV in Cali, Colombia. Two facilitators were trained after the adaptation process. The facilitations delivered GPS to one group of 3 HIV positive gay men. A psychologist followed the sessions and assessed the facilitators regarding compliance with the intervention objectives and motivational interviewing counselling (MI). Qualitative interviews with the recipients of GPS were processed and summarized in order to improve the further implementations of GPS.

**RESULTS:** The adapted GPS was highly acceptable to Colombian HIV-positive gay men. Minimum adaptation of materials was needed and included language and local cultural specificities (i.e. more information about treatment, Colombian laws regarding HIV and sexual rights). The use of sexual diaries, the fact that the facilitators were gay and HIV positive, and the level of knowledge of the facilitators were positive aspects of the implementation. Participants felt that they still need to be more comfortable using condoms in oral sex, but all achieved close 100% use of condoms in their anal sex. In addition, they reported GPS helped them to increase 1) HIV knowledge, 2) confidence in having a stable partner, and 3) self-esteem. Facilitators met the objectives and very little extra training was needed as a way to improve their MI skills. Participants suggested changes to GPS implementation including increasing time of each session, more audiovisual tools, bigger groups of men of similar ages, and additional peer support after the intervention.

**CONCLUSION:** The result of this process is an adapted positive intervention of gay men in Colombia, with training materials and very acceptable for local communities. Further results of current implementation will help us to assess effectiveness of GPS.

### EPH31

#### INTEGRATING RESPONDENT DRIVEN SAMPLING (RDS) RECRUITMENT AND PEER FACILITATION: PRELIMINARY RESULTS ON REACHING POPULATIONS MOST AT RISK FOR HIV/SYPHILIS IN CALI, COLOMBIA

**Montano, David<sup>1</sup>; Mueses-Marín, Hector F<sup>1</sup>; Galindo, Jaime<sup>1</sup>; Kim, John<sup>2</sup>; Martínez-Cajas, Jorge L<sup>3</sup>; Wylie, John<sup>2</sup>; Pai, Nitika P<sup>4</sup>; Jolly, Ann<sup>5</sup>; Alvarado, Beatriz E<sup>3</sup>**

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**INTRODUCTION:** A strategy that incorporates peer facilitation and RDS recruitment for offering HIV/Syphilis counselling and testing is being currently conducted. The strategy impact on engaging most-at-risk populations, and linking to care those who result positive, is preliminarily assessed.

**METHODOLOGY:** Leaders belonging to target communities (Men who have sex with men, transgender women and afro-Colombian minorities) were trained as counsellors. They selected a number of “seeds” for starting a RDS recruitment network based the seeds connections with the community. Seeds and all subsequent participants were directed to ask three people, whom they considered at risk, to participate in the study.

The intervention included: a) pre and post- test HIV/STI counselling; b) a structured questionnaire; c) HIV/Syphilis rapid testing; d) collection of samples for confirmatory tests and referral to medical care, if the HIV rapid test was reactive; and e) referral for complementary testing and medical care, if the syphilis rapid test was reactive.

**RESULTS:** Since July 2014, 174 participants have been recruited from 17 seeds. The rate of HIV+ cases for both screening and complementary tests was 8.2%, the rate of return for confirmatory HIV tests results was 71.4%. 64.3% of HIV positive cases were linked to care, 80% of which had a CD4 count over 500 cells/mm<sup>3</sup>. 16.1% rapid tests for syphilis were positive; 57% returned for complementary tests and 46.4% returned for medical attention.

**CONCLUSIONS:** These results suggest that the proposed recruitment strategy has been effective in reaching at risk population, reflected in the high frequencies of reactive HIV and syphilis rapid tests. A high rate of return for HIV results has been achieved, possibly attributable to peer facilitation. Once the sample size is achieved, these findings will be further explored; also, a qualitative assessment of the RDS methodology will be performed, and the strategy impact will benchmarked against other initiatives.

### EPH32

#### USING PHARMACY-BASED HIV POINT OF CARE TESTING TO ACCESS HARD TO REACH POPULATIONS

**Pringle, Jill I<sup>1</sup>; Hoyano, Dee<sup>2</sup>; Bannar-Martin, Sophie<sup>2</sup>; Rai, Bob<sup>1</sup>; Chow, Nancy<sup>1</sup>; Buchner, Chris<sup>1</sup>, Holliday, Elizabeth<sup>1</sup>**

<sup>1</sup>Vancouver; <sup>2</sup>Victoria, BC

**BACKGROUND:** This research examines a pilot project for HIV Point of Care (POC) testing in four pharmacies across Vancouver and Vancouver Island, Canada. The pilot is a joint collaboration between Vancouver Coastal Health, Island Health, Pharmacy BC and Medicine Shoppe pharmacy owners. The pilot aims to provide HIV testing to individuals who may not have obtained a test through more conventional methods such as via their family physician or hospital emergency department.

The development of AIDS shortly after diagnosis indicates late testing (CDC, 2010). By providing an alternative option to obtain testing, the ultimate goal of this pilot is to ensure that individuals are diagnosed with HIV in the early onset of the disease.

**METHODS:** The pilot was initiated in July 2014 and extends into 2015. Clients volunteered to obtain free POC testing, offered by pharmacists, visiting four pharmacies in Vancouver, Victoria and Nanaimo. Quantitative data was collected using Point of Care testing screeners administered by the pharmacists.

**RESULTS:** Between July and November 2014, 404 individuals obtained an HIV POC at the Vancouver pharmacies. 68 tests were conducted at the Vancouver Island sites between launch and October 2014. The pilot succeeded in its goal to test hard to reach clients as well as unsuspected population: in Vancouver, the majority of individuals who tested were first time testers (74%), and Asian ethnicity (60%). Island sites saw the majority of individuals identifying as Caucasian (88%) and male (56%).

**CONCLUSION:** The pharmacies attracted a large number of first time testers. The results of this short pilot suggests that offering access to Point of Care testing within low-barrier settings such as community-based pharmacies can be effective in reaching populations that tend to avoid testing in more traditional environments.

### EPH33

#### RANDOMIZED CONTROLLED TRIAL OF MOTIVATIONAL INTERVIEWING FOR REDUCING INJECTION RISK BEHAVIOURS AMONG PERSONS WHO INJECT DRUGS

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<sup>1</sup>Longueuil; <sup>2</sup>Montréal, QC

**OBJECTIVE:** To test the efficacy of a brief motivational interviewing (MI) intervention to reduce high-risk injection behaviours over a 6-month period compared with a brief educational intervention (EI).

**METHODS:** A single site 2-group parallel randomized controlled trial was carried out. People who injected drugs (PWID) and had shared drug injection equipment or shared drugs by backloading or frontloading in the month prior to recruitment were randomized to either the MI or EI group. The interventions (at baseline) and interviews (baseline and 3 and 6 months later) took place at the study office located in downtown Montréal, close to the community-based harm reduction programs where PWID were recruited. The primary outcome was defined as reporting any of the following risk behaviours in the month prior to interview: having shared syringes, containers, filters or water to inject drugs, and backloading/frontloading; each behaviour was examined separately, as secondary outcomes. Intent-to-treat analyses were carried out using generalized linear mixed-effects model with an underlying logistic distribution for dichotomous outcomes.

**RESULTS:** The final sample consisted of 219 participants (mean age 37.85 years; 82.2% male) including 108 and 111 participants in the EI and the MI group respectively. The probability of reporting a risk injection behaviour decreased over the study period in both groups. Further, after 6 months of follow-up, participants who reported any risk behaviour were 50% (OR=0.50; CI: 0.13-0.87) less likely to be in the MI group than in the EI group as well as those who reported sharing containers (OR=0.50; CI:0.09-0.90). PWID who reported sharing equipment excluding syringes were 53% less likely to be in the MI group (OR = 0.47; CI: 0.11-0.84).

**CONCLUSIONS:** A brief motivational interviewing intervention was more effective than a brief educational intervention in reducing some high risk injecting behaviours up in the subsequent 6 months.

### EPH34

#### EXAMINING SOCIO-SPATIAL DISPARITIES IN CERVICAL CANCER SCREENING AMONG A COHORT OF WOMEN LIVING WITH HIV IN CANADA

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<sup>1</sup>Burnaby; <sup>2</sup>Vancouver, BC; <sup>3</sup>Toronto, ON; <sup>4</sup>Montreal, QC

**BACKGROUND:** Annual cervical cancer screening is recommended in Canada for women living with HIV (WLWH). We assessed the prevalence of annual Pap tests and measured socio-spatial disparities to Pap testing among WLWH across three Canadian provinces.

**METHODS:** Baseline survey data were analyzed among WLWH (≥16 years) enrolled in the Canadian HIV Women's Sexual and Reproductive Health Cohort Study (CHIWOS), a longitudinal, community-based research study in British Columbia (BC), Ontario (ON) and Quebec (QC). The questionnaire assessed medical history, use of clinical and social services (including Pap testing), health outcomes, and socio-spatial determinants of health. For this analysis, eligibility criteria included having a cervix and a uterus. Multivariable logistic regression identified independent correlates of annual Pap testing.

**RESULTS:** Among 946 women, 24% were from BC, 55% from ON and 21% from QC. The median age was 41 [IQR: 35-49.5] and 22% reported being partnered or married. In the sample, 37% identified as Caucasian, 31% as African/Caribbean/Black, and 23% as Aboriginal. Overall, 71% of WLWH in the study reported receipt of Pap test in the previous year, with significant variation by province (BC: 82%, ON: 65%, QC: 77%) and the majority (73%) receiving Pap tests at their HIV clinic. There were no significant differences in spatial variables (distance to HIV care, length of travel time, location of clinic) between women who did and did not report annual Pap testing. In the multivariable logistic regression model, women who identified as African/Caribbean/Black (Adjusted Odds Ratio [AOR]=2.02, 95% Confidence Interval (CI): 1.3-3.14) and had a female primary HIV doctor (AOR=2.27, 95% CI: 1.59-3.25) were more likely to report annual Pap testing.

**CONCLUSION:** In this analysis, receipt of Pap testing was associated with having a female primary HIV doctor and identifying as African/Caribbean/Black among a cohort of WLWH with relatively high rates of cervical cancer screening. Significant social disparities exist in Pap testing practices among WLWH in Canada. Experiences of where and how WLWH access cervical cancer screening will be further investigated.

### EPH35

#### EVALUATING HARM REDUCTION SERVICES TO IMPROVE HIV PREVENTION ACROSS VANCOUVER COASTAL HEALTH

**Young, Sara K; Moreheart, Sarah; Buchner, Chris; Buxton, Jane; Amlani, Ashraf**

**Vancouver, BC**

The BC Harm Reduction Supplies and Services (HRSS) committee coordinates harm reduction supply and service delivery in partnership with the province's Health Authorities (HAs), including Vancouver Coastal Health (VCH). VCH has over 150 registered harm reduction supply distribution sites, which provide services to reduce harms related to substance use and/or sexual practices. HIV prevention is central to the provision of harm reduction supplies and delivery of harm reduction services. Ongoing program evaluation and quality improvements are necessary to ensure harm reduction services are effective and meeting the needs of those most at risk for substance use / sexual health harms, including HIV. In 2014 BC HRSS partnered with VCH to conduct over 600 Harm Reduction Site Surveys at 20 sites across VCH. These surveys capture information on demographics, drug use trends, site usage, access to supplies, overdose experiences, potentially harmful practices, use of methadone, and need for supervised and/or assisted injection. Participants received a \$5 gift card.

BC HRSS Survey responses are entered and SPSS analysis has begun. In January 2015, initial findings will be examined by the VCH Harm Reduction Coordinating Committee. Findings will be used to prioritize improvements to the delivery of harm reduction services at each site surveyed, and will guide quality improvements across the VCH region.

Quality improvements will address gaps in policies and practices, including in harm reduction supply availability, educational materials, overdose prevention and intervention services, and other services aimed at preventing HIV and other substance use / sexual health harms.

## Epidemiology and Public Health: HIV Program Science

## Épidémiologie et santé publique : La science dans l'élaboration des programmes sur le VIH

### EPH36

#### HEALTH CARE UTILIZATION AMONG HIV POSITIVE INDIVIDUALS IN MANITOBA, CANADA PRIOR TO HIV CARE

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**Winnipeg, MB**

**BACKGROUND:** Despite effective therapies to treat HIV, a substantial proportion of newly-diagnosed HIV positive individuals continue to present at advanced stages of their disease. Understanding utilization patterns of HIV positive individuals prior to diagnosis can inform earlier diagnosis and engagement strategies. We examined rates of ambulatory care visits and hospitalizations among HIV cases and compared them to HIV negative controls.

**METHODS:** Data were from a retrospective cohort from Manitoba, Canada. Participants included HIV-positive individuals presenting to care between 2007-2011 to the Manitoba HIV program (MHP), and HIV-negative controls, matched (1:5) by age, sex and region. Clinical information was linked to population-based administrative databases, including physician visits and hospitalizations. Rates were calculated with utilizations as the numerator, and the number of days registered with the single insurance provider, prior to case date, as the denominator. Case date was defined as first clinic visit with the MHP. Diagnoses associated with physician visits were classified according to International Classification of Diseases chapters. Stratified Poisson regression models were used to compare rates between cases/controls, with relative rates (RRs) and their 95% confidence intervals (95% CI) are reported.

**RESULTS:** A total of 164 cases and 809 controls were included. Physician visits and hospitalizations were higher for cases, compared to controls. In the 5 years prior to case date, compared to their HIV-negative controls, cases were more likely to be diagnosed with "Infectious and Parasitic Conditions" (RR: 4.7, 95% CI: 4.3-5.1; p<0.0001) and "Blood and Blood Disorders" (RR: 3.1, 95% CI: 2.6-3.7; p<0.0001). Similarly, hospitalization rates were higher among cases (RR: 2.5, 95% CI: 2.1-2.9; p<0.0001).

**CONCLUSION:** The higher use of health services by those subsequently diagnosed with HIV present lost opportunities for screening, diagnosis and treatment. This research was conducted in partnership with program managers and policy makers and these results will provide important information for both prevention and care services within the MHP and Manitoba Health.

## EPH37

### HIV TESTING AND REPRODUCTIVE HEALTH ISSUES AMONG WOMEN INVOLVED IN SEX WORK IN ZAPORIZHZHYA, UKRAINE: PROGRAMMATIC IMPLICATIONS FOR THE PREVENTION OF HIV, STIS, AND UNINTENDED PREGNANCIES

Becker, Marissa L<sup>1</sup>; McClarty, Leigh M<sup>1</sup>; Pavlova, Daryna<sup>2</sup>; Balakireva, Olga<sup>2</sup>; Sazonova, Yana<sup>2</sup>; Sakovych, Olena<sup>2</sup>; Emmanuel, Faran<sup>1</sup>; Blanchard, James F<sup>1</sup>

<sup>1</sup>Winnipeg, MB; <sup>2</sup>Kyiv, Ukraine

**BACKGROUND:** HIV and STI rates are very high among female sex workers (FSWs) in Ukraine. Despite active HIV/STI prevention programmes, very little is known about their reproductive health needs. In 2012, UNICEF Ukraine, the University of Manitoba, and the Ukrainian Institute for Social Research conducted epidemiological mapping in Zaporizhzhya, Ukraine to characterise the local HIV epidemic, with specific focus on FSWs. The project also focused on understanding their reproductive health needs.

**METHODS:** Behavioural surveys were conducted by members of local, key populations who were trained as field researchers. Epidemiological mapping identified “hotspots” in Zaporizhzhya where FSWs congregate. Multistage cluster sampling was used to recruit participants from these hotspots. Descriptive statistical analyses are presented.

**RESULTS:** Of 124 self-identified FSWs, 34% reported seeing ≥10 clients in the past week, while 56% had seen ≥3 clients in the last day. Despite this high risk, only 40.2% of participants had ever been tested for HIV. Nearly 60% of participants reported ever being pregnant and 53.3% had received abortion services in the past. However, utilisation of reproductive health services was low. Only 16.2% had ever visited a health facility for obstetrical/gynaecological services, 10.8% for STI-related services, and less than one-third of participants had ever had a Pap test. Over 97% of women reported ever using contraceptives, but when asked about family planning strategies, 100% mentioned solely using condoms and only 18.3% had used oral contraceptives, while 14.2% had relied on coitus interruptus at some point.

**DISCUSSION:** Dual methods of protection are emphasized for FSWs. Our findings highlight the need for healthcare facilities and programmes to focus on enhancing accessibility of reproductive health services. Condoms and other modern, non-barrier methods of contraception must be made easily available to women involved in sex work, in addition to conventional HIV prevention services. As well, further research is needed to understand potential barriers to utilisation of dual methods of protection among FSWs in Ukraine.

## EPH38

### REGULATORY CAPACITY BUILDING UNDER THE CANADIAN HIV VACCINE INITIATIVE: ADDRESSING THE CHALLENGES FACED BY NATIONAL REGULATORY AUTHORITIES IN SMALL AND MIDDLE INCOME COUNTRIES

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Ottawa, ON

**BACKGROUND:** The Canadian HIV Vaccine Initiative (CHVI) is a partnership between the Government of Canada and the Bill and Melinda Gates Foundation with the goal of developing a safe, affordable, effective and globally accessible HIV vaccine. Given that several major vaccine clinical trials are targeted for HIV endemic regions of the world such as Sub-Saharan Africa, Health Canada's role within the CHVI is to assist in strengthening regulatory capacity building in developing National Regulatory Authorities (NRAs) in collaboration with the World Health Organization and other international organizations. The objective is to help protect the ethical and scientific integrity of the vaccine clinical trials and speed the development and approval of HIV vaccines.

**METHODS:** The regulatory needs of the NRAs were identified using surveys, face-to-face meetings and teleconferences. In cooperation with the NRAs, Health Canada regulatory experts develop training materials and conduct workshops using case studies and interactive approaches. Training sessions included topics such as clinical trial application review for both clinical and quality elements, as well as the role of risk benefit assessment in regulatory decisions.

**RESULTS:** Since 2010, Health Canada has trained over 200 participants from more than 40 countries under the CHVI. This includes the establishment and continued mentorship with regulatory agencies in Nigeria and Malawi and regional training in Southern and Eastern Africa. Health Canada also organises annual International Regulatory Forum and sponsors participants from different NRAs to provide learning opportunities and encourage the exchange of best regulatory practices.

**CONCLUSION:** Health Canada has been successfully implementing capacity building activities in collaboration with NRAs to enhance their regulation of vaccines. Moving forward, training efforts will utilize a regional approach in order to maximize training of regulatory staff in countries with similar training needs.

## EPH39

### ENHANCED SYPHILIS SCREENING AMONG HIV-POSITIVE MEN: EVALUATION OF A CLINIC-BASED INTERVENTION

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<sup>1</sup>Toronto; <sup>2</sup>Ottawa, ON

**BACKGROUND:** Syphilis re-emergence among urban men who have sex with men (MSM) in Canada has serious implications for those co-infected with HIV. Routine and frequent syphilis screening has the potential to ensure timely detection and treatment, minimize disease burden, and help control the ongoing spread of syphilis and HIV.

**OBJECTIVES:** To enhance syphilis screening among HIV-positive men by conducting a clinic-based intervention that incorporates syphilis testing into routine HIV bloodwork for this population. Trial objectives are to determine to what degree the intervention:

- 1) Increases screening coverage
- 2) Increases screening frequency
- 3) Reaches men at highest risk
- 4) Results in more detected cases of untreated syphilis.

**DESIGN:** The trial is designed as a pragmatic, stepped wedge cluster-randomized controlled trial that gradually introduces the intervention across four HIV clinics in Toronto and Ottawa. The intervention is to do syphilis serology whenever a male patient has an order for HIV viral load, which generally occurs every 3-6 months. The control condition is the maintenance of current practices. Test results will be obtained from the provincial public health laboratory and will be supplemented by a standardized clinical worksheet and medical chart review at the clinics. Detailed clinical, psychosocial and behavioural data is available for those who are also participants of the OHTN Cohort Study. Process evaluation plans include audit and feedback of compliance to identify potential barriers. Health economic components include evaluation of the impact and cost-effectiveness of the intervention.

**SIGNIFICANCE:** This trial will be the first of its kind in Canada and will provide evidence regarding the feasibility and effectiveness of clinic-based interventions to improve STI screening among HIV-positive men. Our program science approach involving researchers and knowledge users will facilitate scale-up in the study sites and other HIV clinics should the intervention be effective.

*Trial Registration: ClinicalTrials.gov NCT02019043*

## EPH40

### CONCURRENT “RISK BEHAVIOURS” REPORTED AMONG WOMEN INVOLVED IN SEX WORK IN ZAPORIZHZHYA, UKRAINE: IMPLICATIONS FOR HIV PREVENTION PROGRAMMING

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<sup>1</sup>Winnipeg, MB; <sup>2</sup>Kyiv, Ukraine

**BACKGROUND:** Ukraine is experiencing Europe's most rapidly growing HIV epidemic, driven primarily by injection drug use and unprotected sex between women involved in sex work and clients. In 2012, UNICEF Ukraine, the University of Manitoba, and the Ukrainian Institute for Social Research



conducted an epidemiological mapping and epidemic appraisal project in Zaporizhzhya, Ukraine to assess and characterise its local HIV epidemic, with specific focus on women involved in sex work. As in many contexts, globally, sex workers are disproportionately burdened by Ukraine's epidemic. This study examines overlapping "risk behaviours" reported by young women involved in sex work in Zaporizhzhya.

**METHODS:** Behavioural surveys were conducted to characterise sexual and drug-using behaviours of young women (14-25 years) self-reporting involvement in sex work. Members of local, key populations were trained as field researchers to collect data. Mapping identified "hotspots" in Zaporizhzhya where sex workers and other key populations congregate. Multistage cluster sampling was used to recruit participants from identified hotspots. Descriptive statistical analyses are presented to highlight frequency and concurrency of self-reported risk behaviours among participants.

**RESULTS:** Among 124 young women involved in sex work, the average age at entry into sex work was 15.7 years. Participants most commonly reported practicing street-based sex work, and on average, saw 10.3 clients/week. Consistent condom use was reported by 69% of women and anal sex with male partners and clients was very common – reported by three-quarters of participants. Over half (50.8%) of participants reported ever using drugs, while 47% reported ever injecting drugs, 12.5% admitted to sharing needles, and nearly two-thirds injected  $\geq 2$  times/day.

**IMPLICATIONS:** The complex array of vulnerabilities that are faced by women involved in sex work highlights the need for well-tailored interventions to address the emerging HIV epidemic in Zaporizhzhya. Importantly, given the extensive overlap of high-risk behaviours reported by participants, targeted interventions must not only focus on the traditional promotion of safe sexual practices, but also incorporate harm reduction strategies more broadly, through needle exchange and methadone programmes.

#### EPH41

##### PROGRAM SCIENCE AND THE MOBILIZATION OF KNOWLEDGE AND COMMUNITIES: TOWARDS AN INTEGRATED MODEL FOR HIV PREVENTION AND HEALTH PROMOTION

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Montreal, QC

**BACKGROUND:** Within population health, program science offers a new approach to addressing the increasing complexity of HIV prevention and treatment (Blanchard and Aral, 2013) that could harness and democratize linkages between science and community-based practice. Yet few models have been developed to guide the use of this approach and most fail to specify the processes needed to produce and apply knowledge and mobilize stakeholders and communities throughout the design, implementation, and evaluation of interventions.

**OBJECTIVE:** Outline and discuss a model for operationalizing and applying some principles of program science to address HIV and its impact at the population level.

**METHOD:** A multiple-case study was conducted, focused on interventions with which the author has been involved over the course of 25 years of community-based HIV research, to analyze processes associated with the implementation of these interventions for various populations.

**RESULTS:** This model integrates four transversal and recurrent processes of knowledge and community mobilization: 1) partnership to bring stakeholders together (community members, researchers, knowledge users, decision makers) in an equitable manner; 2) co-production of knowledge, as a shared goal and specific to each stage of implementation; 3) knowledge mobilization and exchange to generate action; 4) capacity building to ensure stakeholders have the necessary resources to pursue and consolidate the translation of knowledge into action. These processes play a role at each stage of implementation: a) analysis of needs, strengths, and individual and community resources; b) piloting; c) scaling-up; and d) securing long-term sustainability.

**CONCLUSION:** This model emphasizes processes for mobilizing knowledge and communities and the identification of issues specific to each process. In order for community mobilization to truly contribute to the illumination of science and vice versa, and to avoid its instrumentalization for public health purposes at the expense of social justice, more attention to these processes is required within program science.

## Epidemiology and Public Health: Interdisciplinary Epidemiology (Biological, Behavioural and Social) or Biopsychosocial Research

## Épidémiologie et santé publique : Épidémiologie interdisciplinaire (biologique, comportementale et sociale) ou recherche biopsychosociale

#### EPH42

##### HIV/AIDS HEPATITIS SEXUALLY TRANSMITTED INFECTIONS PREVENTION AMONG EGYPTIAN SUBSTANCE USERS

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Cairo, Egypt

**AIMS:** The aim was to understand why people practiced unprotected sex and substance use regarding the risk of infection by blood-borne viruses and STIs, and the factors influencing risky practices. The purpose of the study was to inform policy recommendations and improving prevention methods of BBVs/STIs among Egyptian substance users, particularly health/sex education in schools, media, peer groups, NGOs, and the criminal justice system.

**METHODS:** A questionnaire survey of knowledge, attitude and practice with 410 substance users was conducted. Respondents were analyzed according to gender, age, education and intravenous injection. Chi square, student t-test, Mann-Whitney, Spearman correlation and multiple logistic regression tests were calculated, and p-value <0.05 was considered statistically significant. Three qualitative studies were conducted; they comprised four focus group discussions with 27 substance users, including female sex workers, MSM and IVDUs and 14 interviews with policy-makers.

**RESULTS:** Respondents with higher education had higher knowledge scores for safer sex. Positive correlation was shown between age and knowledge of safer sex. Older respondents were predicted to know more about safer sex. Females and IVDUs were predicted to have higher attitude score for safer sex. KAP of risky sexual behavior to infection with BBVs/STIs among substance users was low. More risky injection behavior was observed in females and non-IVDUs. The participants chose peer-to-peer outreach and health/sex education, as their preferred prevention method. Policy-makers found that harm reduction programs, like methadone-replacement, needle-exchange in prisons and police stations should be introduced.

**CONCLUSION:** The study described and explored the cultural influences on high risk behaviors among Egyptian substance users. Recommendations included further research on the substance users who are not engaged with drug rehabilitation programs, stigma in detail, evaluating the effectiveness and acceptability of prevention, e.g. randomized trials and qualitative process evaluations.

#### EPH43

##### THE RELATIONSHIP BETWEEN STRESS, DEPRESSION AND ANTIRETROVIRAL THERAPY ADHERENCE AMONG WOMEN LIVING WITH AND ACCESSING CARE FOR HIV IN TORONTO, ONTARIO, BETWEEN 2007 AND 2012

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**BACKGROUND:** Women with HIV experience distinct stressors and greater depression than men with HIV that may interfere with antiretroviral therapy (ART) adherence. We investigated the relationship between stress, depression and adherence among women in care for HIV.

**METHODS:** A cross-sectional study was conducted using data from clinical charts of 307 women from 3 sites in the Ontario HIV Treatment

Network (OHTN) Cohort Study (OCS), and a standardized questionnaire completed at the last interview. Variables of interest were: stress (National Population Health Survey), depression (Center for Epidemiologic Studies Depression Scale), hazardous alcohol use (Alcohol Use Disorders Identification Test) and ART adherence (AIDS Clinical Trial Group Questionnaire). Adequate adherence was defined as missing  $\leq 1$  pill in 4 weeks ( $\geq 95\%$  adherence). Logistic regression models were used: to identify covariates of adequate adherence and to quantify the relationship between stress and adherence and evidence of mediation via depression and moderation by employment status, ethnicity, age at interview, and living alone.

**RESULTS:** The median age of participants was 43 years and 60.7% ( $n=181$ ) self-identified as African, Caribbean or Black. The majority (88.5%,  $n=192$ ) had  $\geq 200$  CD4 cells/mm<sup>3</sup> and an undetectable viral load (85.7%,  $n=186$ ) despite 65.5% ( $n=201/307$ ) having adequate adherence. No hazardous alcohol use (OR=2.24, 95% CI:1.14-4.40) and fewer stress events (OR=0.56, 95% CI:0.33-0.94, per 5 events) had increased likelihood of adequate ( $\geq 95\%$ ) adherence. The relationship between environmental stress (i.e., stress derived from area of residence) and adherence was attenuated among women  $\leq 35$  years (OR=0.73, 95% CI:0.56-0.94) compared to  $\geq 45$  years (OR=0.51, 95% CI:0.34-0.77) and was not significant for women aged 36-44 years (OR= 1.05, 95% CI:0.67-1.65).

**CONCLUSIONS:** Interventions for women accessing HIV care are needed to improve adherence to  $\geq 95\%$ . Interventions should aim to manage, adapt to or mitigate stress and depression and focus on education and adaptive coping strategies for hazardous alcohol use for improved HIV management and adherence.

#### EPH45

##### PERCEIVED AND ACTUAL RISK OF HIV ACQUISITION AMONG HIV-NEGATIVE MSM IN TORONTO, CANADA

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<sup>1</sup>Toronto, ON; <sup>2</sup>Vancouver, BC

**BACKGROUND:** Risky sexual behaviour can result in a high perceived risk, which can motivate precautionary behaviour thus decreasing perceived risk. However, if risky sexual behaviour doesn't correlate with high perceived risk, it cannot initiate precautionary behaviour. Our goal was to determine the association between risky sexual behaviour and perceived risk.

**METHODS:** Sexually active men who have sex with men (MSM) were recruited at a Toronto medical clinic in 2010-12. Participants completed a socio-behavioural questionnaire using ACASI. Actual risk was created using factor scores from principal component analysis (PCA). Perceived risk was measured by asking participants what the chances were that they would ever get HIV. Multivariable regression was performed using the Harrell method.

**RESULTS:** We recruited 150 HIV-negative MSM (median age 44.5 years [IQR 37-50]). Actual HIV risk comprised three components. 1) 'casual sex': number of casual partners and condom use during insertive or receptive anal intercourse (IRAI) with a casual partner. 2) 'HIV-positive sex': condom use during IRAI with a regular HIV-positive partner. 3) 'HIV unknown status sex': condom use during IRAI with a regular HIV unknown status partner. Twenty nine MSM (20%) perceived their HIV risk to be high. In multivariable analysis, those with low condom use on the 'HIV-positive sex' component were found to be 18 times more likely to have a high perceived risk (95% CI 1.71-189.80) compared to those with high condom use. Older age was associated with lower perceived risk but only age 40-49 compared to less than 30 was statistically significant (95% CI 0.015-0.70). Men who used poppers in the previous 6 months were 5.59 times more likely to have a high perceived risk compared to those who didn't use poppers (95% CI 1.23-25.48).

**CONCLUSION:** Perceived HIV risk increased significantly as condom use with an HIV-positive partner decreased. However, perceived HIV risk was not significantly increased when condom use with casual partners or HIV unknown status regular partners decreased, even though these behaviours could be considered risky.

#### EPH46

##### BEST PRACTICE RECOMMENDATIONS FOR CANADIAN HARM REDUCTION PROGRAMS THAT PROVIDE SERVICE TO PEOPLE WHO USE DRUGS AND ARE AT RISK FOR HIV, HCV, AND OTHER HARMS – PART 2: SERVICE MODELS, REFERRALS FOR SERVICES, AND EMERGING AREAS OF PRACTICE

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Toronto, ON

Our aim was to create an evidence-based set of user-friendly recommendations for Canadian harm reduction programs that provide service to people who use drugs and are at risk for HIV and other harms. This new document addresses practice issues not addressed in Part 1 (see [www.catie.ca/en/programming/best-practices-harm-reduction](http://www.catie.ca/en/programming/best-practices-harm-reduction)) which focused on equipment distribution for injection drug use and smoking crack cocaine, safer drug use education, and overdose prevention. We used a narrative synthesis method to search, retrieve, assess, and synthesize the most up-to-date evidence from Canada, United States, Great Britain, Europe, Australia, and other countries with public health systems similar to Canada. Scientific evidence was reviewed to create syntheses and recommendations concerning the following areas of practice: service model design; equipment distribution for steroid/hormone injection, piercing and tattooing, smoking heroin, and smoking crystal methamphetamine; testing and vaccination; skin and vein care; referrals to HIV and HCV treatment, substance use treatment, mental health services, and housing services; education and other services for the prison context; and relationships with law enforcement. Due to study designs (i.e., evidence from cross-sectional studies) and/or limited available evidence, it was difficult to ascertain 'key' intervention components for some topic areas. Using varied knowledge exchange methods by multiple team members (including conference presentations, webinars, fact sheets, and panel discussions), our goal is to promote awareness of and access to the Best Practice Recommendations among harm reduction practitioners across Canada. Changing existing harm reduction policies and practices to be in line with these newer recommendations will improve the health of marginalized populations by reducing inequities including improved access to safer injection and inhalation supplies.

## Epidemiology and Public Health: Introducing New Data Sources: Cohort Studies, Administrative Databases, Surveys, etc.

## Épidémiologie et santé publique : Introduction de nouvelles sources de données : études de cohortes, bases de données administratives, enquêtes, etc.

### EPH47

#### CREATE A DYNAMIC POPULATION-BASED COHORT OF PERSONS LIVING WITH HIV TO INFORM POLICY, PRACTICE AND ONGOING RESEARCH IN NEWFOUNDLAND AND LABRADOR (NL)

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**BACKGROUND:** Development of a comprehensive cohort of people living with HIV (PLHIV) to help improve healthcare has long been the vision of researchers, clinicians and decision-makers. Cohort development is particularly difficult in regions that have dispersed populations and small numbers of PLHIV. With funding from the Community-based Primary Healthcare group (CBPH-CIHR) and the support of the NL Center for Health Information, provincial HIV clinic and Public Health Laboratory, a comprehensive cohort of PLHIV is being developed. The database includes longitudinal data from NL data sources to assess the epidemiology and management of HIV.

**OBJECTIVE:** Present Phase One – To develop a timely process for compiling and updating the NL HIV-cohort database, while ensuring confidentiality and privacy.

**METHOD:** A feasibility study on the development of a governance structure, approvals including ethics and data custodians, methodology for data extraction and linkage, development of a de-identified electronic database, and initial assessment of data quality and data-sharing strategies. A snowball approach identified relevant stakeholders. An iterative modified Delphi process and a member-checking survey is employed to document the process by which data are accessed, linked and refined, and to identify barriers and facilitators for compiling and updating. A logic model and evaluation framework guides more timely updates of the database.

**RESULTS:** The existing acquisition and aggregation of health-administrative and clinical data took over two years. Barriers include the use of dissimilar data formats and different technology systems, lack of alignment between approaches to ethics and health authorities' legislation, staff training and the challenges of planning secure systems for controlled data-sharing. Enablers include ethically-approved data extraction which ensures privacy and confidentiality with minimum impact on data quality and analysis.

**CONCLUSION:** Evidenced-informed approaches to HIV policymaking are contingent upon a dynamic, population-based PLHIV database kept current through systematic and transparent processes.

### EPH48

#### DEVELOPMENT OF AN ITEM BANK REFLECTING COGNITIVE CONCERNS EXPRESSED BY PEOPLE WITH HIV

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**BACKGROUND:** People living with HIV are concerned about their memory, because as life expectancy increases, it is becoming clear that this chronic illness affects both cognition and mental health, even with excellent systemic viral control. Patients often report deteriorating cognition but what is relevant to the health care situation and what is related to natural aging or other factors like stress, anxiety, or depression is difficult to untangle. The overall aim of this study is to create an item bank

reflecting the cognitive concerns expressed by people with HIV as a first step towards developing a measure.

**METHODS:** The steps outlined by the FDA for developing a patient-reported outcome are being followed. Semi-qualitative interviews on an international sample of 234 people HIV+ was carried out in 3 independent waves using an anonymous web-based survey (Canada) and face-to-face interviews (International). The concerns were mapped to standard neurocognitive domains to identify content coverage and compared with those domains in existing cognitive questionnaires. A bilingual questionnaire has been developed and is being posted on HIV sites across Canada to obtain estimates of prevalence and importance. Rasch analysis will be used to calibrate the items and develop short forms to fit different purposes (screening, prevalence, change over time). Comparative values will be obtained from people without HIV.

**RESULTS:** 136 areas of cognitive concern were identified covering all 15 neurocognitive domains plus emotional concerns and change. None of the generic or HIV specific measures came close to this extent of content coverage. Memory concerns were the most common (n=40) and covered prospective, episodic, semantic, immediate, procedural memory; 15 concerns related to attention; 12 concerns were identified for each of language and executive function; 4 and 3 concerns related to visuospatial and calculation domains.

**CONCLUSIONS:** The lack of relationship between self-reported cognitive concerns and results on neurocognitive testing may partially be explained by poor questions. Using all due diligence, this study will contribute optimal items so a fair comparison can be made between the two methods.

### EPH49

#### FACTORS ASSOCIATED WITH LATE INITIATION OF ANTIRETROVIRAL THERAPY: PRELIMINARY RESULTS FROM THE ENGAGE COHORT STUDY

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**<sup>1</sup>Vancouver; <sup>2</sup>Burnaby, BC; <sup>3</sup>New York City, NY, USA**

**BACKGROUND:** The purpose of ENGAGE is to identify socio-demographic factors associated with late initiation of antiretroviral therapy (ART) among people living with HIV in British Columbia.

**METHODS:** People living with HIV and newly initiating ART (within the previous 6 months) were enrolled in ENGAGE, a prospective cohort study nested within the provincial Drug Treatment Program (DTP) at the BC Centre for Excellence in HIV/AIDS. Participants complete a 1-hour structured survey collecting demographics, ART attitudes and adherence behaviours, and use of healthcare and support services. CD4 count and plasma viral load were obtained via linkage to the DTP. The primary outcome, 'late initiation of ART', was defined as CD4 cell count <500 cells/μL at time of initiation. Bivariate analyses (Wilcoxon rank-sum and Fisher's exact test) were used to test the association between late initiation and socio-demographic characteristics.

**RESULTS:** Since December 2013, 55 participants were enrolled in ENGAGE, representing 14% of the 380 eligible individuals. Enrollees were 15% female, median age of 40 years [IQR: 30 to 45], 28% reported Aboriginal ancestry, and had a median annual personal income of \$13000 [IQR: 7800 to 27600]. In addition, 24% reported ever being incarcerated and 25% a history of injection drug use. The median CD4 cell count at time of ART initiation was 500 cells/μL [IQR: 310 to 640]. Overall, 55% of our participants were late ART initiators.

Higher personal income was the only variable found to be negatively associated with late initiation (Odds ratio (OR)=0.62 (95% CI 0.40 to 0.98) per thousand-dollar increase). Female gender was marginally associated with late initiation (OR: 7.30, 95% CI 0.83 to 62.50) with a greater proportion of women (88%) initiating late than men (49%).

**CONCLUSION:** In this analysis, over half of the individuals initiating ART in BC initiated late, with disparities observed by income level. Multivariate models are needed to adjust for confounders and clarify the interpretation.



## EPH50

### PROFILE OF PHYSICIANS WHO PRESCRIBE ANTIRETROVIRALS (ARVS) IN BRITISH COLUMBIA (BC) IN 2013

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<sup>1</sup>Vancouver; <sup>2</sup>Burnaby, BC

**BACKGROUND:** Despite known disparities in access to HIV care and treatment in Canada, the exact number of physicians who provide HIV treatment is unknown. In addition, there is limited information available regarding the characteristics of physicians who provide HIV treatment. Knowing the profile of physicians who prescribe ARVs (hereon ARV Physicians) can provide a better understanding of educational and programmatic needs to improve and expand HIV care and treatment by primary care providers.

**METHODS:** The characteristics of ARV Physicians in BC between January 1, 2013 and December 31, 2013 are described, based on the data from the BC Centre for Excellence in HIV/AIDS Drug Treatment Program.

**RESULTS:** In 2013, there were 894 ARV Physicians in BC, and among them 749 (83.8%) only refilled ARV during follow-up (i.e. did not initiate/change ARV regimen), 8 (0.9%) only initiated/changed ARV and 137 (15.3%) performed both initiation/change and refill. 93.4% of the ARV Physicians were general practitioners (GPs) (infectious diseases 2.8%, internal medicine 1.9%, other specialists 1.9%) and a mean of 7.8 HIV patients were seen per one ARV Physician in BC. There were 105 ARV Physicians practicing in rural areas (11.7%) (789 [88.3%] in urban areas) and among them there was only one specialist (internal medicine) in rural areas. More ARV Physicians in urban areas were experienced in HIV care (i.e. have treated more than 6 HIV patients in the past) compared to their rural counterparts (30.9% vs. 9.5%,  $p < 0.05$ ).

**CONCLUSION:** In 2013, the majority of ARV Physicians in BC did not initiate/change ARV regimen, but rather refilled an existing prescription. Also, ARV Physicians were predominantly GPs. ARV Physicians in urban areas were more experienced in HIV care compared to their rural counterparts. These results suggest the need to support and train GPs in HIV care and treatment, particularly in rural areas.

## EPH51

### PATTERNS OF PRESCRIPTION DRUG UTILISATION PRIOR TO DIAGNOSIS OF HIV AMONG CLIENTS OF THE MANITOBA HIV PROGRAM: DATA FROM THE MISSED OPPORTUNITIES FOR DIAGNOSIS OF HIV EPIDEMIOLOGICAL STUDY (MODES)

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**BACKGROUND:** Many Canadians are diagnosed at relatively late stages of HIV infection, leading to poorer long-term health outcomes and increased probability of transmission. Understanding patterns of health service utilisation among individuals prior to diagnosis of HIV may be helpful to develop strategies facilitating earlier diagnosis and linkage into care. Using data from a population-based retrospective cohort, we examine rates of prescription drug utilisation among clients of the Manitoba HIV Program (MHP), prior to entry into HIV care.

**METHODS:** We performed population-based case-control analyses, in which MHP clients (cases) were age-, sex-, and health region-matched (1:5) to HIV-negative controls. Clinical data from MHP was linked to an administrative database of Manitoba's Drug Program Information Network. Rates of prescription drug utilisation were calculated for cases and controls, using total number of pills prescribed (normalised to a 7-day dispensation cycle) as numerator and person-days prior to HIV diagnosis as denominator. Dispensations were categorised based on drug-type: antibiotics, drugs for chronic conditions (hypertension, diabetes, etc.), and mental health conditions (anxiety, bipolar disorder, etc.). Stratified Poisson regression models were used to generate relative rates (RR) and 95% confidence intervals (95% CI).

**RESULTS:** 193 MHP clients and 965 controls were included for analysis. In the one-year prior to entry into care, cases were significantly more

likely than controls to use antibiotics (RR=3.2; 95% CI=2.8-3.7), anxiolytics (RR=2.2; 95% CI=2.0-2.5), diabetic medications (RR=1.2; 95% CI=1.1-1.3), and mood stabilisers (RR=1.4; 95% CI=1.2-1.7). During the same period, lower dispensation rates for drugs to treat hyperlipidemia (RR=0.7; 95% CI=0.6-0.8), hypertension (RR=0.6; 95% CI=0.6-0.7), and schizophrenia (RR=0.7; 95% CI=0.6-0.8) were observed among cases than controls.

**CONCLUSION:** Generally higher rates of prescription drug dispensation were observed among MHP clients, highlighting complex healthcare needs, even prior to entry into care. Greater dispensation of anxiolytics and mood stabilisers among cases may suggest a need for more diligent HIV testing among individuals using such medications. Notably, high rates of antibiotic utilisation prior to entry into care with MHP imply greater burden of opportunistic co-infections, and specifically highlight missed opportunities for earlier diagnosis of HIV.

## Epidemiology and Public Health: Policy Evaluations

## Épidémiologie et santé publique : Évaluations des politiques

## EPH52

### RECOMMANDATIONS DE PRATIQUES EXEMPLAIRES POUR LES PROGRAMMES CANADIENS DE RÉDUCTION DES MÉFAITS AUPRÈS DES PERSONNES QUI CONSOMMENT DES DROGUES ET QUI SONT À RISQUE POUR LE VIH, LE VHC ET D'AUTRES MÉFAITS POUR LA SANTÉ – MAINTENANT DISPONIBLES EN FRANÇAIS

Strike, Carol; Watson, Tara Marie

Toronto, ON

Les pratiques de consommation de drogues qui peuvent entraîner la transmission du VIH, du VHC et d'autres méfaits sont des enjeux pressants qui affectent les communautés, aux quatre coins du Canada. Les recommandations de pratiques exemplaires qui existaient pour les programmes de seringues et d'aiguilles sont obsolètes. Notre équipe communautaire a impliqué des individus de partout au pays, représentant les personnes qui utilisent des drogues, les fournisseurs de services, les chercheurs et les responsables des politiques, dans la conception, la création et la dissémination de recommandations de pratiques exemplaires actualisées, à présent disponibles dans les deux langues officielles. À l'aide d'une méthode de synthèse narrative, nous avons examiné et résumé les meilleures données scientifiques disponibles, et avons récemment fait traduire de l'anglais vers le français l'ensemble résultant de recommandations de pratiques exemplaires pour la distribution de seringues; la distribution d'autres types de matériel pour l'injection; la distribution de matériel plus sécuritaire pour fumer le crack; l'élimination et la manipulation de tout matériel qui a servi à consommer des drogues; l'éducation sur une utilisation plus sécuritaire des drogues; et l'utilisation de la naloxone pour prévenir les surdoses. Au moyen d'une vaste stratégie de dissémination, nous joignons des publics anglophones et francophones qui utilisent le document, notamment des personnes qui utilisent des drogues et des fournisseurs de services, dans des programmes de réduction des méfaits à travers le Canada.

## Epidemiology and Public Health: Process Advances and Lessons Learned in Complex or Community-based Public Health Research

### Épidémiologie et santé publique : Progrès des processus et leçons tirées dans les recherches complexes ou communautaires en santé physique

#### EPH53

##### BUILDING BRIDGES: A MODEL FOR COMMUNITY ENGAGEMENT IN EPIDEMIOLOGY RESEARCH

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<sup>1</sup>Toronto, ON; <sup>2</sup>Vancouver, BC; <sup>3</sup>Dartmouth, NS; <sup>4</sup>Burnaby; <sup>5</sup>Skeena Watershed, BC; <sup>6</sup>Hamilton; <sup>7</sup>Thunder Bay, ON

**BACKGROUND:** A process embedded with Indigenous methodology for using cohort data is lacking. Building Bridges (BB) aimed to develop and pilot a model to meaningfully engage Aboriginal leaders and peoples living with HIV (PHAs) in epidemiology research.

**METHODS:** BB is a multi-site (Toronto and Vancouver) community-based research project using Canadian Observational Cohort (CANOC) collaboration data. In Phase I (model development), advisory committees of Aboriginal stakeholders were developed to guide subsequent phases and inform the application of Indigenous methodology to epidemiology. In Phases II and III (recruitment; research question development), Aboriginal PHAs collaborated with researchers and Indigenous leaders to identify epidemiology questions of interest. In Phase IV (data analysis), analysis of CANOC data was performed. In Phases V and VI (data interpretation; knowledge translation), participants, researchers and Indigenous leaders discussed findings and developed strategies for sharing them. For each phase, meals were provided at meetings, Traditional Leaders led ceremonies and discussions occurred in culturally safe gatherings.

**Lessons learned:** Consistent, frequent and respectful engagement through meetings, emails and teleconferences facilitated team building, however, limited email or phone access was a barrier. Mitigating barriers and clear communication of roles and project duration was important for recruitment. Identifying Indigenous leadership at community and research levels was pivotal to all phases. Team expertise in lived experiences, Indigenous culture, HIV research, epidemiology, services and support enabled multi-directional learning. Limitations included recruitment challenges and breaks in continuity during data analysis. CANOC limitations included low numbers of Aboriginal participants and the inability to address socio-behavioural questions. Involvement of allied academic researchers facilitated meaningful relationships with community through the advisory committee structure.

**CONCLUSIONS:** BB led to a collaborative Aboriginal epidemiology model and impactful research questions. Success hinged on ongoing engagement of Indigenous leaders, participants, service providers and researchers with diverse expertise and co-learning occurring among these groups.

#### EPH54

##### HIV HEALTH EQUITY EXPERIENCES OF AFRICAN, CARIBBEAN, AND BLACK MEN LIVING WITH HIV/AIDS

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This qualitative study explored the experiences of immigrant, refugee, and non-status men from the African, Caribbean, and Black (ACB) communities living with HIV/AIDS in the Greater Toronto Area (GTA). The

purpose was to identify gaps in current HIV health equity resources in the GTA and propose appropriate solutions. The focus group was conducted at a local AIDS Service Organization (ASO) in Toronto with 8 men living with HIV/AIDS from the ACB communities who self-identified as either gay or heterosexual. Based on a modified Grounded Theory analyses of the transcripts and on thematic coding, a range of issues faced by the ACB men emerged that (1) increased the risk for HIV infection, (2) delayed seeking timely care, (3) created obstacles to HIV testing and equitable access to medical treatment, and (4) identified a lack of mental well-being services, especially those operating from an anti-oppressive framework. The themes that emerged from the group identified the need for more culturally specific support services, for greater involvement from ASO's in facilitating discussion groups and social spaces for ACB men living with HIV/AIDS, greater sensitivity to and more recognition of the dangers for men having sex with men in their countries of origin from Canadian immigration officials, and the need for more specific guidelines regarding HIV disclosure for healthcare providers. In particular, in the area of interventions needed, participants noted that campaigns and initiatives were needed to address the prominence of HIV-related stigma in ACB communities. This stigma was cited as a reason that many ACB men decline to be tested for HIV, and that this stigma also decreases the willingness of men to disclose their HIV status to others, including their sexual partners. Following from the analyses of this focus group data, it is also clear that ASO's and health care providers serving these communities must address the link between normative gender role expectations and hetero-normative assumptions concerning sexual behaviors that can expose ACB men to potential HIV infection.

## Epidemiology and Public Health: Public Health Ethics

### Épidémiologie et santé publique : Éthique en santé publique

#### EPH56

##### ADVANCING EMPIRICAL POPULATION AND PUBLIC HEALTH ETHICS REGARDING HIV/AIDS

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Vancouver; Burnaby, BC

**BACKGROUND:** HIV/AIDS researchers and theorists from the field of population and public health have yet to discuss how the generation of empirical data ought to be considered in the task of ethical inquiry. Nonetheless, various contexts are advocating for the generation of population and public health ethics- (PPHE-) relevant data in order to inform HIV/AIDS-related policy. Thus, the timing is ideal to engage in philosophical and methodological discussions about how PPHE can (and should) consider or generate data within the task of HIV/AIDS-related normative inquiry related to HIV/AIDS.

**DESCRIPTION:** In this paper, I review the philosophical debates related to the 'empirical turn' in clinical bioethics. I also describe how population and public health ethics has engaged with the philosophical implications of using or generating empirical data. Finally, I provide examples for potential empirical PPHE studies pertaining to five HIV/AIDS-related issues.

**LESSONS LEARNED:** Each issue pertaining to HIV/AIDS that I discuss differs from traditional empirical bioethical approaches in that it emphasizes: (1) concerns related to the population; (2) "upstream" policy-relevant health interventions – within and outside of the health care system; and (3) the prevention of illness and disease and the promotion of health and well-being. As I highlight, HIV/AIDS represents an ideal issue to begin an exploration into issues pertaining to empirical PPHE approaches, given that there are a variety of issues that arise within and outside of the clinic, provide opportunities for prevention and concern individual- and population-level outcomes and interests.

**CONCLUSION:** I advance a conceptualization of an empirical PPHE in order to open up new interdisciplinary 'spaces' in which empirical and normative approaches to ethical inquiry are transparently (and ethically) integrated in the realm of HIV/AIDS research. Critical approaches to em-

pirical PPHE regarding HIV/AIDS can provide opportunities to develop more philosophical and empirical rigour within this field.

## Epidemiology and Public Health: Social Determinants of HIV Prevention, Risk, Testing, and Care

## Épidémiologie et santé publique : Déterminants sociaux de la prévention, du risque, du dépistage et des soins concernant le VIH

### EPH57

#### STRUCTURAL DETERMINANTS OF INCONSISTENT CONDOM USE WITH CLIENTS AMONG MIGRANT SEX WORKERS: FINDINGS OF LONGITUDINAL RESEARCH IN AN URBAN CANADIAN SETTING

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**OBJECTIVES:** Migrant female sex workers experience unique risks and protective factors related to sexual health. Given the dearth of knowledge in high-income countries, we explored factors associated with inconsistent condom use by clients among migrant sex workers over time in Vancouver, BC.

**METHODS:** Questionnaire and HIV/STI testing data from a longitudinal community-based cohort of female sex workers, AESHA, were collected from 2010-2013. Logistic regression using generalized estimating equations (GEE) was used to model correlates of inconsistent condom use by clients among international migrant sex workers over a 3-year study period.

**RESULTS:** Of 685 participants, analyses were restricted to 182 (27%) international migrant sex workers, whose primary country of origin was China. Of 401 observations, 28 (7%) events of inconsistent condom use by clients were reported over 3 years. In multivariate GEE analyses, difficulty accessing condoms (Adjusted Odds Ratio (AOR) 3.76, 95% Confidence Interval (CI) 1.13-12.47) was positively correlated with inconsistent condom use by clients, whereas servicing clients in indoor establishments (e.g., massage parlours) (AOR 0.34, 95% CI 0.15-0.77), and high school attainment (AOR 0.22, 95% CI 0.09-0.50) were negatively correlated with inconsistent condom use by clients.

**DISCUSSION/CONCLUSIONS:** Findings of this study highlight the persistent difficulties faced by migrant sex workers in terms of accessing and using condoms with clients. Given that criminalization and police raids often impede condom access for migrant sex workers in indoor work venues, a shift away from criminalization to support occupational health and rights for migrant sex workers remains critically needed. Unfortunately, Canada's recent move towards increased criminalization of the sex industry (e.g., bill C-36 enacted in December 2014) may further exacerbate barriers to condom access for migrant sex workers. Laws, policies and programs promoting access to safer, decriminalized indoor work environments remain urgently needed to promote health, safety and human rights for migrant sex workers.

### EPH58

#### CONDOMLESS SEX WITH SERODISCORDANT OR HIV-UNKNOWN PARTNERS AMONG MSM IN THE OHTN COHORT STUDY (OCS)

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<sup>1</sup>Windsor; <sup>2</sup>Toronto, ON

**BACKGROUND:** To help contribute to poz prevention resource allocation, this analysis examines prevalence of condomless anal sex (CAS) among male participants in the OHTN Cohort Study (OCS) who identified

as gay or bisexual or ever reported having had sex with a male partner (MSM).

**METHODS:** Multiple logistic regression of sociodemographic, substance use, and clinical data to identify factors associated with CAS.

**Demographics:** N=2,171 gay/MSM had eligible sexual risk behaviour data between 2010 and 2013. Of these, 88% per cent identified as gay, 7% as bisexual and 4% as heterosexual. Mean age was 49. Seventy percent had been diagnosed with HIV ≥10 years. Eight-seven percent reported an undetectable viral load (<50 copies/mL).

**RESULTS:** Forty-four percent reported no male partner in the previous three months, 25% reported having a regular partner, 14% a casual partner, and 17% both regular and casual partners. Overall, 13% reported CAS with an HIV-negative or unknown status partner in the previous three months. Bisexual or heterosexual identity was associated with less CAS (OR=0.45, CI=0.24-0.85, p=0.01) as was a CD4 count <200 (OR=0.23, CI=0.10-0.56, p=0.001). Detectable viral load was associated with more CAS (OR=1.73, CI=1.01-2.96, p=0.04) as was non-medicinal drug use in the past six months (OR=3.71, CI=2.68-5.15, p<0.0001). Overall 18% reported non-medicinal drug use, primarily cocaine, methamphetamines, and club drugs. Among those with ≥1 partner, N=1,225, CAS was associated with larger numbers of partners (5-9 partners, OR=2.0, CI=1.06-3.76, p=0.03; ≥10 partners, OR=4.82, CI=2.57-9.04, p<0.0001).

**CONCLUSIONS:** OCS data suggest that condomless anal sex with non-positive partners is significantly associated with detectable viral load, five or more sexual partners, and using club drugs, crystal meth, and cocaine. Poz prevention resources would be best focused on people living with HIV with higher risk of CAS.

### EPH59

#### PSYCHOSOCIAL AND EVENT-LEVEL PREDICTORS OF CONDOM USE DURING ANAL INTERCOURSE AMONG SELF-IDENTIFIED HIV-NEGATIVE AND UNKNOWN STATUS GAY AND OTHER MSM IN VANCOUVER, BRITISH COLUMBIA

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<sup>1</sup>Vancouver; <sup>2</sup>Victoria, BC

**BACKGROUND:** We sought to identify psychosocial and event-level factors associated with condom-use during anal intercourse among self-identified HIV-negative and HIV status unknown MSM in the Greater Vancouver Area.

**METHOD:** We analyzed data from participants in the Momentum Health Study collected at enrollment on their most recent sexual encounter with each of up to five sexual partners in the past six months. Explanatory factors included event-level factors (substance use, partner's HIV status, sexual history with partner, and sexual position), psychosocial scales (e.g., HAART Optimism, Sexual Altruism, Sexual Sensation Seeking (SSS), Cognitive Escape), and demographics. Of all sexual encounters where anal intercourse was reported, factors associated with condom-use versus not were determined using manual backward stepwise multivariable generalised linear mixed models.

**RESULTS:** The majority of HIV-negative or unknown status MSM reported at least one anal intercourse event in the past six months (85.0%, n=436/513). Two-thirds of all sexual encounters involved anal intercourse (64.1%, n=1196/1866) of which 56% used a condom. Condom-use was positively associated with higher sexual altruism community subscale scores (AOR=1.98, 95% CI: 1.46-2.68) and negatively associated with greater HAART optimism (AOR=0.95, 95% CI: 0.91-0.99), sexual sensation seeking (AOR=0.94, 95% CI: 0.89-0.98), and cognitive escape (AOR=0.97, 95% CI: 0.94-0.99). At the event-level with that partner, longer time since first sex and higher frequency of recent anal sex were both negatively associated with condom-use (AOR=0.99, 95% CI: 0.99-0.99 and AOR=0.96, 95% CI: 0.95-0.98, respectively). Compared with men who didn't know their partner's HIV status, participants who were certain their partner was HIV-negative or HIV-positive were less likely to report condom-use (AOR=0.24, 95% CI: 0.08-0.72 and AOR=0.11, 95% CI: 0.03-0.39, respectively). Event-level substance use was associated with condom-use: participant alcohol use (AOR=1.43, 95% CI: 1.02-2.00) and partner crystal methamphetamine use (AOR=0.19, 95%



CI: 0.07-0.55). Lower odds of condom-use were associated with annual income >\$30,000 (AOR=0.66, 95% CI: 0.45-0.95) and being in a monogamous relationship vs. single (AOR=0.50, 95% CI: 0.30-0.82).

**CONCLUSION:** Health promotion for gay and other MSM must consider how event-level factors such as substance use, HAART optimism, partner familiarity, discussions of HIV serostatus, and psychosocial traits collectively affect condom-use decision-making.

## EPH60

### COMMUNITY ACCEPTANCE AND HIV SEXUAL RISK AMONG GAY AND BISEXUAL MEN IN LONDON, ONTARIO

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<sup>1</sup>London; <sup>2</sup>Toronto, ON

**BACKGROUND:** Included in Statistics Canada's largest geographical "peer group", London, Ontario is typical of many mid-size Canadian cities. At a local health forum, community acceptance and homophobia were identified as key factors impacting LGBTQ health, with implications for gay and bisexual men. We studied these with regard to HIV-related sexual risk.

**METHODS:** Survey data were collected from gay and bisexual men (n=202) in Middlesex-London, Ontario; 173 reported their HIV status as negative/unknown and were included in this analysis. Modified Poisson regression was used to model unadjusted and adjusted prevalence risk ratios (PRRs). A model was fit for non-modifiable sociodemographic and background factors, and then community factors added: social support; internalized homonegativity; perception of community acceptance of people like oneself (based on orientation, racialization, gender identity) from the broader Middlesex-London community, and separately from the gay community.

**RESULTS:** Older age was associated with decreasing risk. Other sociodemographic factors and childhood background factors (childhood homophobia, religious upbringing) were not. For each 10-year increase in age, prevalence of high-risk sex decreased by 24% (PRR=0.76; 95% CI: 0.60, 0.95). Controlling for age, we found an interaction between perception of broader community acceptance and gay community acceptance of people like oneself. Overall, as broader community acceptance increased, high-risk sex decreased. However, this effect varied depending upon perceptions of gay community acceptance, with men feeling most accepted within gay community having the smallest reductions in high-risk sex.

**CONCLUSION:** The interaction between broader community acceptance and gay community acceptance, independent of age, raises a series of questions. Among these: How do community norms and availability of partners shape sexual risk-taking? Are conventional "contextualized" measures of sexual risk sufficient, or do they miss important risk-mitigation strategies (undetectable viral load, strategic sexual positioning, or PEP/PrEP) used within gay communities?

## EPH61

### REGIONAL DIFFERENCES IN HIV AND STI TESTING, TREATMENT, AND NOTIFICATION AMONG ONTARIO GAY, BISEXUAL, AND OTHER MEN WHO USE THE INTERNET TO SEEK SEX WITH OTHER MEN (MISM)

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**Toronto, ON**

**BACKGROUND:** We sought to examine differences by geographic region for HIV and STI testing prevalence, HIV treatment, and STI notification among a sample of Ontario MISM.

**METHOD:** From December 2013 to January 2014, MISM aged 16 or older were recruited from Internet sites, mobile-apps, and ASOs across Ontario to complete a 15-minute anonymous online questionnaire, which included demographic and other questions on HIV and STI testing, treatment, and notification. Regional differences were determined using multivariable logistic regression controlling for significant confounders (i.e., age, sexual orientation, education, and race/ethnicity).

**RESULTS:** Of 1,830 participants, 146 reported being HIV-positive (8.1%), 217 unsure (12.0%), and 1,439 HIV-negative (79.9%). A greater proportion of HIV-positive respondents were from Toronto (12.7%) com-

pared with all other regions (6.3%,  $p<0.001$ ). Of HIV-positive men, the median year of diagnosis was 2004 and 90.3% reported being on ARV treatment. Of those on treatment, all but one reported an undetectable viral load, which did not vary by region ( $p=0.25$ ), but was marginally associated with an earlier year of diagnosis ( $p=0.058$ ). While 50.4% of HIV-negative men had received a negative test in the past six months, 9.2% reported never testing for HIV. Participants outside Toronto were marginally more likely to have never tested for HIV (AOR=1.43, 95% CI: 0.98-2.07). For STI testing, 60.7% of participants had been tested in the past year and 18.3% of those tested received at least one positive diagnosis. Men from Toronto were more likely to have been tested in the past year (AOR=1.84, 95% CI: 1.44-2.34) and, if tested, to have received a positive diagnosis (AOR=1.56, 95% CI: 1.13-2.22). Of all participants, only 4.2% reported being notified by public health about an STI in the past year. After adjustment, Toronto men were no more likely to have been notified (6.1%) than men from other regions (3.5%,  $p=0.15$ ). Participants qualitatively described their benefits, concerns, and challenges with STI notification experiences.

**CONCLUSIONS:** Differing HIV and STI testing and positivity prevalence should help inform targeted testing promotion to those MISM most susceptible to HIV and STI transmission.

## EPH62

### FACTORS ASSOCIATED WITH HIV TESTING FROM AN ONLINE SURVEY OF GAY, BISEXUAL, AND OTHER MEN WHO HAVE SEX WITH MEN LIVING IN MIDDLESEX COUNTY, ONTARIO: THE HEALTH IN MIDDLESEX MEN MATTERS (HIMMM) PROJECT

**Coleman, Todd A<sup>1,2</sup>; Bauer, Greta R<sup>1</sup>; Pierre Pitman, Lyn<sup>1</sup>; Pugh, Daniel<sup>2</sup>; Fraser, Meredith<sup>1</sup>; Murphy, Kevin<sup>1</sup>; Powell, Leanne<sup>1</sup>**  
<sup>1</sup>London; <sup>2</sup>Toronto, ON

**BACKGROUND:** Gay, bisexual, and other men who have sex with men (GB-MSM) remain the group most heavily affected by HIV in Canada. There is a paucity of research available outside of larger metropolitan areas regarding GB-MSM use of HIV testing.

**METHODS:** The Health in Middlesex Men Matters (HiMMM) Project is a community-based research project examining health and HIV in GB-MSM in Middlesex County, Ontario. Respondents of an online, cross-sectional survey (n=202) were recruited through web-based, smart phone-based, and in-person promotion, and through social networks. Surveys were completed over 2011-2012 by adult GB-MSM living in Middlesex County, Ontario, Canada (n=202). Modified Poisson regression was utilized to calculate crude and adjusted prevalence ratios for whether participants had not been tested within the past 6 months. Additionally, reasons for not having been tested in the past 2 years are presented. Analyses were limited to HIV-negative individuals and those of unknown status (n=173).

**RESULTS:** Almost two thirds (64.1%) had not received an HIV test within the past 6 months. Factors significantly associated with reduced likelihood of being untested – controlling for other predisposing, enable and need factors – included greater social connection to GLBT communities, being less religious or spiritual than in childhood, and having a high school (versus postgraduate) education. Being unemployed was associated with greater likelihood of being untested. Primary reasons for not having accessed testing within the past two years included feeling at low risk for HIV (69.2%), always having safer sex (51.9%), not having had sex with an infected person (28.9%), and being in relationships (15.5%).

**CONCLUSIONS:** Knowledge of testing practices for GB-MSM subgroups in Middlesex County is important for directing competent, effective health promotion efforts, allowing local testing services to direct resources towards GB-MSM with lesser reported access testing services, depending on need.

**EPH63****AWARENESS AND KNOWLEDGE OF TREATMENT AS PREVENTION (TASP) AMONG HIV-POSITIVE AND HIV-NEGATIVE MEN WHO HAVE SEX WITH MEN IN VANCOUVER, CANADA**

Carter, Allison<sup>1</sup>; Lachowsky, Nathan<sup>1</sup>; Rich, Ashleigh<sup>1</sup>; Forrest, Jamie I<sup>1</sup>; Sereda, Paul<sup>1</sup>; Cui, Zishan<sup>1</sup>; Roth, Eric<sup>2</sup>; Kaida, Angela<sup>3</sup>; Moore, David<sup>1</sup>; Montaner, Julio S<sup>1</sup>; Hogg, Robert S<sup>3</sup>  
<sup>1</sup>Vancouver; <sup>2</sup>Victoria; <sup>3</sup>Burnaby, BC

**BACKGROUND:** Treatment as Prevention (TasP) is a critical public health strategy to reduce HIV morbidity, mortality, and transmission. We assessed awareness and knowledge of TasP among gay, bisexual, and other men who have sex with men (GBMSM) in Vancouver.

**METHODS:** Data were analyzed for Momentum Health Study participants, recruited via Respondent Driven Sampling. Socio-demographic and behavioural variables were measured through a self-administered questionnaire, and clinical variables through nurse screening and linkage to the BC Centre for Excellence in HIV/AIDS. Stratified by HIV status, multivariable logistic regression identified covariates of TasP awareness (ever vs. never heard of TasP). Among those aware, TasP knowledge was explored through examination of short-answer definitions of TasP, risk perceptions, and information source. Analyses are RDS-adjusted.

**RESULTS:** Of 719 participants, 23% were HIV-positive and 46% heard of TasP. TasP awareness was higher among HIV-positive (69%) than HIV-negative GBMSM (41%,  $p < 0.0001$ ). Models showed HIV-positive GBMSM were more likely to have heard of TasP if they were Canadian born, unemployed, not using party drugs, and had higher CD4 counts. HIV-negative GBMSM were more likely to have heard of TasP if they were Caucasian (vs. Aboriginal), students, had higher education, a regular partner, and multiple sexual partners. Among those aware of TasP, 21% of HIV-positive and 13% of HIV-negative GBMSM ( $p < 0.0001$ ) demonstrated complete TasP definitions (with three factors identified: ARV use, viral suppression, and prevention of HIV transmission), and 64% and 41% respectively felt HIV treatment made the risk of transmitting or acquiring HIV 'a lot lower' ( $p = 0.0020$ ). The leading information source was doctors (44%) for HIV-positive GBMSM and gay media (34%) for HIV-negative GBMSM.

**CONCLUSION:** While TasP awareness was high among HIV-positive GBMSM, it was relatively low among HIV-negative GBMSM and varied by key socio-behavioural and clinical factors. Men's articulation of their knowledge of TasP was poor, albeit better among HIV-positive men. For GBMSM to make use of TasP, they must understand it. Health communication strategies relevant to diverse communities of GBMSM are critical to advancing TasP health literacy.

**EPH65****FACTORS ASSOCIATED WITH HIV RISK IN ONTARIO'S BROAD TRANSFEMININE POPULATION: THE CHALLENGE OF HETEROGENEITY FOR TRANSGENDER HIV PREVENTION RESEARCH**

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<sup>1</sup>London; <sup>2</sup>Waterloo; <sup>3</sup>Toronto, ON

**BACKGROUND:** HIV seroprevalence among transfeminine (i.e. male-to-female spectrum transgender) persons in high-income countries has been estimated at 21.6%, while 3.1% in Ontario self-reported being HIV-positive. This study is the first to identify correlates of HIV-related sexual risk in a Canadian transfeminine population.

**METHODS:** The Trans PULSE Project surveyed trans Ontarians in 2009-2010 ( $n = 433$ ; transfeminine  $n = 205$ ), using respondent-driven sampling. Estimates were weighted based on network size using RDS II methods, and variances were adjusted for clustering by recruiter. Polytomous logistic regression models were built to identify associations of demographic, trans-specific, and psychosocial factors with both HIV-related sexual risk and abstinence (chosen or involuntary) in the past year, versus low-risk sex.

**RESULTS:** 19% of transfeminine Ontarians reported past-year sexual behaviours consistent with high HIV risk (primarily as insertive partners in vaginal sex) while 51% reported no sex. Demographic and modifiable factors were associated with abstinence, including geographic location, childhood sexual abuse, and hormone and surgical status. Few interven-

able factors were associated with high HIV risk. In bivariate analyses, those who had not socially transitioned gender had higher odds of sexual risk (OR=5.31, 95% CI: 1.12, 25.1). Sexual anxiety, body image worries, and lower sexual satisfaction were negatively associated. Adjusting for demographic and transition background, older age was associated with higher odds of sexual risk (OR for a 10-year increase= 1.79, 95% CI: 1.03, 3.13). Condom efficacy was associated with lower sexual risk.

**CONCLUSION:** Factors hypothesized to be associated with sexual risk were largely associated with abstinence. In this broad trans population sample, the relatively low prevalence of high HIV-related risk, coupled with the low fraction of such risk attributable to sex with non-trans men, posed challenges for identification of intervenable factors to reduce HIV vulnerability. Canadian studies that focus on the sub-group of trans women who have sex with men are needed.

**EPH66****EMOTION REGULATION STRATEGIES ARE ASSOCIATED WITH SEXUAL RISK BEHAVIOURS AMONG GAY, BISEXUAL, AND OTHER MEN WHO HAVE SEX WITH MEN**

Tulloch, Tyler G; Noor, Syed W; Brennan, David J;  
 Husbands, Winston; Hart, Trevor A  
 Toronto, ON

**BACKGROUND:** Despite evidence suggesting emotion regulation difficulties are associated with high-risk sexual behaviour, no study to date has examined the use of emotion regulation strategies on high-risk sexual behaviour among gay, bisexual, and other men who have sex with men (GBM).

**METHOD:** Using data from 470 HIV-negative sexually active GBM in Toronto, we examined the impact of two specific emotion regulation strategies: cognitive reappraisal, associated with better interpersonal functioning, and expressive suppression, associated with worse interpersonal functioning, on several indicators of high-risk sexual behaviour. Zero-inflated negative binomial models were fit for count data and log binomial models were fit for binary sexual behaviour outcomes.

**RESULTS:** Most participants (mean age=35, SD=12) were White (59%), born in Canada (60%), and self-identified as gay (86%). Participants reported on average 9 ( $8.4 \pm 21.1$ ) casual sexual partners over the past 90 days, and approximately 22% reported engaging in unprotected anal intercourse (UAI) with a casual partner. After adjusting for age, income, ethnicity, country of birth, sexual orientation, substance use, and depressive symptoms, the use of reappraisal as an emotion regulation strategy was negatively associated with total number of casual partners (IRR=0.86, 95% CI: 0.75–1.00), whereas suppression was not significantly associated with this outcome. Similarly, reappraisal was negatively associated with engaging in UAI with any serodiscordant partner, whether casual or regular (RR=0.86, 95% CI: 0.75–0.99), whereas suppression was positively associated with this outcome (RR=1.12, 95% CI: 1.00–1.26).

**DISCUSSION:** Reappraisal was associated with reduced sexual risk behaviour, whereas suppression was associated with greater sexual risk behaviour, suggesting that not only are these two emotion regulation strategies differentially associated with interpersonal functioning, but they are also differentially associated with sexual behaviour. Future HIV prevention interventions should target emotion regulation strategies in order to reduce sexual risk behaviour among individuals at high risk for contracting HIV.

**EPH67****MOVING BEYOND RISK FACTORS: THE ROLE OF PROTECTIVE FACTORS IN REDUCED CONDOMLESS ANAL SEX (CAS) AMONG HIV-NEGATIVE GAY AND BISEXUAL MEN**

Hart, Trevor A<sup>1</sup>; Noor, Syed W<sup>1</sup>; Adam, Barry<sup>2</sup>; Brennan, David J<sup>1</sup>;  
 Husbands, Winston<sup>1</sup>; Cattaneo, Jessica<sup>1</sup>; Rivas, Carlos<sup>1</sup>;  
 Gardner, Sandra<sup>1</sup>

<sup>1</sup>Toronto; <sup>2</sup>Windsor, ON

**BACKGROUND:** In the HIV literature, there is a focus on risk factors that put certain populations at greater risk for HIV, including gay, bisexual and other men who have sex with men (GBM). However, this traditional model does not adequately explain why many GBM do manage to practice consistently protected sex. This study examines the individual and

community-level protective factors that are associated with reduced CAS among GBM.

**METHOD:** Using data from 470 HIV-negative Toronto GBM, we examined if protective factors were associated with CAS with sero-discordant partners. Considering personal characteristics, risk factors (depression, substance use during sex, and childhood trauma) and protective factors (hope, social capital, and social support) as separate blocks, we fit log binomial models with a sandwich estimator calculating relative contribution of each factor as well as block of factors. Using Bayesian Information Criteria (BIC), Likelihood Ratio (LR) test and Tjur R<sup>2</sup>, we identified the best fit model and calculated effect of protective factors above and beyond the risk factors.

**RESULTS:** Approximately 18% reported CAS with a sero-discordant partner (regular/casual) and 15% reported CAS with a casual partner. The lowest BIC value and a significant LR test indicated that models with protective factors fit the data best. In predicting CAS with any (regular/casual) sero-discordant partner the protective-factor model had 73% more predictive power (% $\Delta$  in Tjur R<sup>2</sup> = 73.31%), and in predicting CAS with a casual sero-discordant partner the protective-factor model had 18% more predictive power (% $\Delta$  in Tjur R<sup>2</sup> = 17.59%) than the risk factor-only model (personal+risk factors).

**DISCUSSION:** Protective factors are associated with reduced CAS above and beyond both personal variables and risk factors that are typically assessed in empirical tests of syndemic theory. These findings show the benefits of examining protective factors against CAS in models of HIV transmission risk behaviours.

## EPH68

### GENDER-BASED SEXUAL VIOLENCE IN A SAMPLE OF OLDER SRI LANKAN YOUTH: FINDINGS FROM THE YOU STUDY SURVEY

**Hart, Trevor A<sup>1</sup>; Coleman, Todd A<sup>1</sup>; Tulloch, Tyler G<sup>1</sup>; Sivagnanasunderam, Buvani<sup>1</sup>; Billimoria, Hans<sup>2</sup>; Deshapriya, Paba<sup>2</sup>**  
<sup>1</sup>Toronto, ON; <sup>2</sup>Mount Lavinia, Sri Lanka

**BACKGROUND:** Although gender-based sexual violence has not been explored among Sri Lankan youth, it has been associated with increased population-level risk for HIV in high prevalence areas, including countries neighbouring Sri Lanka. This study examines support for gender-based sexual violence among Sri Lankan youth.

**METHODS:** The YOU Study (initiated by the Grassrooted Trust) collected data from (n=398) older youth (18-24) across Sri Lanka. The sampling strategy used pre-specified goals of proportionally representative numbers from each district in Sri Lanka, using ratios calculated from the 2012 Census. Modified Poisson regression was used to calculate prevalence risk ratios (unadjusted/adjusted) with two violence-related outcomes (acceptability of a man hitting a woman who has disrespected him, and whether respondents had experienced sexual based violence).

**RESULTS:** Of all respondents, 24.4% agreed that it is acceptable for a man to hit a woman who has disrespected him. Further, of those answering the question, 10.3% had experienced physical violence from their partner during a sexual experience. Not earning an income, and increasing Double Standards (measuring acceptance of traditional sexual double standards) were associated with agreeing that it was acceptable for a man to hit a woman, both at bivariate levels and when modelled together. Inconsistent condom use was not significantly associated with this outcome. Those with lower education levels and who were married were more likely to have experienced physical violence during sex. During modeling, identifying with an ethnicity other than Sinhalese was significantly associated with a lower likelihood of experiencing violence, whereas lower education was significantly associated with a greater likelihood.

**CONCLUSIONS:** There was a high level of support for gender-based sexual violence and experience of actual sexual violence among Sri Lankan youth. Sexual and reproductive health education and services should work on changing attitudes toward gender-based sexual violence as a part of HIV prevention services.

## EPH69

### HIV AND STI PREVENTION KNOWLEDGE IN OLDER SRI LANKAN YOUTH

**Coleman, Todd A<sup>1</sup>; Hart, Trevor A<sup>1</sup>; Tulloch, Tyler G<sup>1</sup>; Sivagnanasunderam, Buvani<sup>1</sup>; Billimoria, Hans<sup>2</sup>; Deshapriya, Paba<sup>2</sup>**  
<sup>1</sup>Toronto, ON; <sup>2</sup>Mount Lavinia, Sri Lanka

**BACKGROUND:** Socio-historical factors (tendency towards later marriage, limited contraception access, emphasis on female virginity) combined with relatively low but steadily increasing HIV and STI rates contribute to a unique environment for providing sexual health education in Sri Lanka. Low levels of sexual health education for youth, and teachers who indicate discomfort with delivering sexuality education have been reported. We examined socio-demographic, psychosocial, and behavioural variables' associations with knowledge of STI and HIV prevention in older Sri Lankan youth.

**METHODS:** The YOU Study collected data from (n=398) older youth (18-24) across Sri Lanka. The sampling strategy used pre-specified goals of proportionally representative numbers from each district in Sri Lanka, using ratios calculated from the 2012 Census. Modified Poisson regression was used to calculate prevalence risk ratios (unadjusted/adjusted) with two knowledge outcomes (STI and HIV prevention knowledge). For modelling, backward elimination was used to retain variables at p=0.20.

**RESULTS:** Approximately one third of respondents were sexually active. For both STI and HIV prevention knowledge, only half (50.8%; 53.6%) were able to identify that condoms were the best way to protect against infection. Younger age, being female, not wishing to disclose or being unsure about their sexual orientation, not earning an income, having lower education were all associated (bivariate) with lower knowledge about STI protection and HIV prevention, as were not having experienced thigh, oral, or vaginal sex. In the final model, younger age, being female, and having never experienced sex were associated with lower STI protection and HIV prevention knowledge.

**CONCLUSIONS:** Given the steadily increasing STI and HIV rates in Sri Lanka, yet low STI and HIV knowledge, a need for accurate HIV and STI prevention information is becoming increasingly important. Our results highlight the need for an approach that considers sexuality education separately for males and females.

## EPH70

### SEXUAL BEHAVIOUR IN OLDER SRI LANKAN YOUTH: FINDINGS FROM THE YOU STUDY

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<sup>1</sup>Toronto, ON; <sup>2</sup>Mount Lavinia, Sri Lanka

**BACKGROUND:** Sri Lanka's HIV rates have historically been lower than its neighbours, but HIV incidence is rising. While information about sexual behaviours among older youth (18-24) is available, few studies have explored results obtained across the entire country. This study examines associations between sociodemographic variables and having experienced thigh, oral, vaginal, and anal sex (lifetime & within 12 months), and condom use for anal and vaginal sex in a cross-national study of older Sri Lankan youth.

**METHODS:** In 2013, the YOU Study collected data from 398 older youth (18-24) across Sri Lanka. The sampling strategy used pre-specified goals of proportionally representative numbers from each district in Sri Lanka, using ratios calculated from the 2012 Census. Modified Poisson regression was used to calculate prevalence ratios (unadjusted/adjusted). For modeling purposes, backward elimination was used to retain variables at p=0.20.

**RESULTS:** Over one third of respondents (35.7%) reported any lifetime sexual activity (thigh, oral, vaginal, or anal sex), with 40.9%, 39.4%, 65.5%, and 20.4% reporting each, respectively, within the past 12 months. Within this timeframe, 55.1% and 73.0% reported never using a condom during vaginal and anal sex. In bivariate associations, respondents more likely to have ever had sex (thigh, oral, anal, or vaginal) were older, male, married, earning an income, identified as Sinhalese (versus Tamil), as Buddhist (versus Hindu), and identified as heterosexual. After backward elimination, only older age, male sex, and heterosexual orientation remained significant at p=0.05.



**CONCLUSIONS:** Given low condom use but increasing HIV incidence in Sri Lanka, comprehensive sexual health and HIV prevention education programs for youth are needed. Programs should attend to ethnic and religious diversity, encouraging condom use during vaginal and anal sex. Programs should incorporate culturally-relevant alternatives such as thigh sex, focusing on encouraging young heterosexual men to engage in HIV and STI prevention behaviours.

## EPH71

### COMPLEXITIES OF MIGRATION, HIV/STI RISK AND PREVENTION: A MIXED-METHODS STUDY WITH MIGRANT SEX WORKERS AT THE MEXICO-GUATEMALA BORDER

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<sup>4</sup>Guatemala City, Guatemala

**BACKGROUND:** In Mexico and Central America, HIV is concentrated in several marginalized populations, including sex workers. Despite high population mobility in this region, evidence regarding the pathways by which migration/mobility experiences influence HIV and sexually transmitted infection (STI) prevention among sex workers remains limited. This study investigated the relationship and pathways by which migration/mobility shape HIV/STI risk and prevention among migrant sex workers at the Mexico-Guatemala border.

**METHODS:** As part of a mixed-methods study, 142 female sex workers in the Mexico-Guatemala border region completed interviewer-administered questionnaires and HIV/STI testing. 47 migrant sex workers completed in-depth interviews regarding migration/mobility patterns and experiences, sex work history, HIV/STI prevention, and health care access.

**RESULTS:** Of 142 participants, 64.8% had travelled outside their birth country, 11.3% had travelled to the U.S., 23.2% had ever been deported, and 22.5% had engaged in sex work in another country in the prior year. Migrant sex workers' narratives indicated that limited access to HIV/STI prevention (e.g., condoms), safety risks along transit routes (e.g., violence, isolation), and abuses by government authorities constrained HIV prevention and exacerbated risks, particularly upon arrival to the border region. However, working in supportive venues where condoms were promoted was critical in fostering risk mitigation, and condom use was often motivated by a desire to maintain good health to remittances to family in home countries. Additionally, many women accessed HIV/STI testing within the context of circular mobility to home countries.

**CONCLUSIONS:** Migration experiences and patterns can have heterogeneous impacts on exposure to HIV/STI risks and prevention for sex workers, especially for recent arrivals. To promote health and safety for migrant sex workers, the design and implementation of community-based interventions and policy changes to ensure access to supportive work environments and address human rights abuses remain critical.

## EPH72

### STRUCTURAL DETERMINANTS OF HIV AMONG FEMALE SEX WORKERS IN GULU, NORTHERN UGANDA

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<sup>1</sup>Vancouver, BC; <sup>2</sup>Kampala, Uganda; <sup>3</sup>Gulu, Uganda

Female sex workers in Sub-Saharan Africa face a disproportionate burden of HIV. Despite the critical role of structural determinants in shaping HIV epidemics, there remain major gaps in evidence among sex workers in Sub-Saharan Africa, with most research focused on behavioural and biological risks. Using questionnaire and serological data from a cross-sectional study conducted in partnership with The AIDS Service Organization (TASO) Gulu among female sex workers from 2011-2012, we used logistic regression to explore structural determinants of HIV among female sex workers in Gulu, Northern Uganda.

Of 400 female sex workers, 135 (33.75%) were HIV positive. Most (n=363, 90.75%) solicited clients in bars/clubs and almost a quarter (n=94, 23.50%) reported paying a third party (e.g., manager) in the prior six months. Almost a third of participants (27.75%) had been previously incarcerated, two-thirds (66.50%) had lived in an internally displaced person (IDP) camp, and one-third (n=129, 32.25%) had experienced

abduction by the Lord's Resistance Army. In a multivariate model, after adjusting for other factors, having children (AOR: 2.62, 95% CI: 1.45-4.70) and history of incarceration (AOR: 2.05, 95% CI: 1.25-3.43) were positively associated with HIV seroprevalence, whereas paying a third party such as a manager (AOR: 0.55, 95% CI: 0.31-0.97) appeared to have a protective influence.

The linkages between incarceration and HIV among sex workers in post-conflict Uganda highlight the significant harms of an increasing trend towards criminalization of key populations in Sub-Saharan Africa, which remains a critical impediment to scaling-up access to HIV prevention and care as well as sexual and reproductive health for populations most in need of these services. The protective role of paying a third party may reflect the role of managers or other third parties (e.g., "trainers") in supporting condom use and access and mitigating occupational violence. Community-based, sex worker-led interventions to promote access to safe workspaces and policy shifts to move away from criminalization towards a human rights-based approach remain needed.

## EPH73

### FREQUENCY AND FACTORS ASSOCIATED WITH HIV TESTING IN MOST AT RISK GROUPS IN CALI, COLOMBIA, 2012-2014

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<sup>1</sup>Cali, Colombia; <sup>2</sup>Kingston, ON

**BACKGROUND:** In Colombia, HIV testing remains low with only 20%-30% of the at-risk population having ever been tested. The Corporacion de Lucha Contra el SIDA (CLS) conducted HIV testing campaigns in low-income neighborhoods in Cali-Colombia and investigated factors associated with previous HIV testing (PHT).

**METHODS:** Between 2012-2014, 939 participants were recruited through voluntary HIV counselling/testing campaigns tailored to reach socioeconomically disadvantaged (SED) and high-risk groups (HRG) for HIV acquisition (MSM, Trans, sex workers). Behavioural surveillance indicators were inquired according to the UN Populations Fund questionnaire. Bivariate and multivariate Poisson regression model were used to calculate prevalence risk ratios and determine the factors associated with PHT.

**RESULTS:** Mean age of participants was 28.5±10.9 years, and 50% were male. There were 356 HRG participants (71% were male). No PHT ever was reported in 38% and 59% of participants in the HRG and SED group, respectively. Less than half of the HRG, and 20% of the SED participants had HIV testing in the previous three years. In both groups, being younger than 25 years and having had a previous doctor-diagnosed STI were strongly associated with PHT. In HRG, having no income was associated with absence of PHT, whilst consistent condom use, practice of commercial sex, and suspecting HIV+ status in a current/past partner were associated with PHT. In the SED group, female sex, being single were associated with PHT. Importantly, 40% of those in the HRG who practiced anal sex had never had PHT.

**CONCLUSIONS:** The frequency of HIV testing in HRG continues to be alarmingly low. HRG seemed slightly more aware of HIV-acquisition risk than the SED group. However, risk behaviours such as practice of anal sex, sex while using psychoactive substances are not resulting in higher rates of HIV testing. Education about these aspects needs to be enhanced in the HIV-testing campaigns.

## EPH74

### HIV-RELATED STIGMA AND UPTAKE OF HIV PREVENTIVE INTERVENTIONS AMONG MEN WHO HAVE SEX WITH MEN AND TRANSGENDER WOMEN IN CHIANG MAI AND PATTAYA, THAILAND

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<sup>1</sup>Toronto, ON; <sup>2</sup>Bangkok, Thailand

**BACKGROUND:** High HIV incidence and prevalence among young men who have sex with men (MSM) and transgender persons (TG) in Thailand indicate the importance of expanded HIV prevention options; nevertheless availability does not ensure uptake. We examined the as-

sociation of HIV-related stigma with uptake of current and emerging HIV preventive interventions among MSM and TG in two Thai cities.

**METHODS:** From February-May 2014, we conducted a 30-minute cross-sectional survey among MSM and TG aged 18-30 years in Pattaya and Chiang Mai to assess HIV-related stigma, HIV risk, and HIV prevention uptake. Participants were recruited using venue-based sampling among gay entertainment venue (go-go bars, massage parlors) staff and MSM- and TG-focused community-based organization attendees. Tablet assisted self-interviewing (TASI) was administered in Thai. We conducted multiple logistic regression to assess correlations between HIV-related stigma (total, felt normative and vicarious) and HIV prevention uptake (condom use, HIV testing, rectal microbicide [RM] acceptability), and forced sex.

**RESULTS:** Across participants (n=389) in Chiang Mai (51%) and Pattaya (49%), 53% identified as gay, 25% transgender, 21% heterosexual/bisexual; median age, 25 years. Two-thirds (67%) reported >3 male partners (past month), 55% paid sex. 65% reported consistent condom use, 48% ever being tested for HIV, and 21% being forced to have sex against their will. Adjusting for sociodemographic variables, participants with higher total HIV-related stigma scores had significantly lower odds of HIV testing uptake (AOR=0.75, 95% CI: 0.60, 0.92), lower RM acceptability (AOR=0.59, 95% CI: 0.41, 0.87), and higher likelihood of forced sex (AOR=1.38, 95% CI: 1.07, 1.78). Both vicarious and felt-normative dimensions were associated with HIV testing and RM acceptability.

**CONCLUSIONS:** HIV preventive interventions and research among young MSM and transgender persons in Thailand, including roll-out of new prevention technologies, should address HIV-related stigma as a social determinant of risk, and reducing the risk of forced sex.

## EPH76

### HIV/HCV PREVENTION AND YOUTH IN ATLANTIC CANADA: IMPLICATIONS FOR TESTING IN NOVA SCOTIA

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**INTRODUCTION:** While HIV and HCV testing remains an important intervention for youth, many barriers to access and uptake remain. This study explored issues that influence testing among youth (ages 15-24) in Nova Scotia where there are limited options for anonymous testing and a general lack of youth-focused HIV and HCV prevention initiatives. This is particularly challenging in the context of Nova Scotia given the limited options for anonymous testing, the current lack of access to HIV point-of-care-testing (HIV POCT), the overall lack of youth-focused prevention policies, and the variable access to youth-inclusive HIV/HCV education strategies.

**METHODS:** Data were collected from a policy scoping review, in-depth interviews and focus group discussions with a diverse sample of youth and adult HIV/HCV prevention stakeholders from across the Atlantic region on issues related to perceptions of and experiences with prevention interventions for youth. Our multidisciplinary research team, including policy trainees, analyzed the data using both a gender-based and a health equity lens to explore key themes related to how issues of access to testing and uptake of testing are understood and confronted.

**RESULTS:** Barriers at both the individual and structural level were identified as influencing youth's reluctance to discuss or seek testing. Stigmatizing perceptions among the general public and negative attitudes about HIV/HCV, a lack of understanding regarding the importance of targeted testing among health care providers were seen as contributing to youths' reluctance to discuss or seek testing, even where services were available.

**CONCLUSIONS:** Although HIV/HCV prevention in Nova Scotia is hampered by competition for limited funding for public health issues, greater awareness among health care providers and parents about the benefits of targeted testing for youth, the need to ensure confidentiality, and a reframing of current negative conceptualizations of HIV/HCV harm reduction policies and programs are needed to meet the prevention needs of youth.

## EPH77

### A MULTI-STATE MODEL EXAMINING PATTERNS OF TRANSITIONING AMONG STATES OF ENGAGEMENT IN CARE IN HIV-POSITIVE INDIVIDUALS INITIATING HIV TREATMENT

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**BACKGROUND:** Continued engagement in HIV care is essential for good clinical outcomes. Measures such as rates of viral load measurement fail to acknowledge that infrequent follow-up may occur either intentionally among patients with sustained virologic suppression or unintentionally among patients with poor clinical outcomes.

**METHODS:** Six states of HIV care were defined within the Canadian Observational Cohort (CANOC) Collaboration: (1) combination antiretroviral therapy (cART) initiation (first year), (2) optimal HIV care (VL<50 copies/mL and CD4 >200 cells/mm<sup>3</sup>, no gaps in cART >3 months, no gaps in CD4 or VL measurement >6 months), (3) successful care with decreased frequency of follow-up (as above except no gaps in CD4 or VL measurement >12 months), (4) suboptimal care (VL >50 or CD4 <200 on 2 consecutive visits over a year follow-up, ≥1 gap in cART >3 months, or ≥1 gap in CD4 or VL measurement >12 months), (5) loss to follow-up (no contact for 18 months), and (6) death. Multistate models were used to determine factors associated with transitioning among states.

**RESULTS:** 8121 participants were included. Individuals transitioning from cART initiation to suboptimal engagement were more likely female (24% vs. 14%; p<0.0001), Aboriginal (14% vs. 5%; p<0.0001), and injection drug users (IDU) (38% vs. 17%; p<0.0001) than participants transitioning to optimal care. Older patients, men, non-IDUs and non-Aboriginals were more likely to transition to optimal care states.

**CONCLUSIONS:** Examination of transitions among care states over the course of disease increases our understanding of factors associated with continued engagement in care. Complete multistate models will be presented.

|                | Optimal to sub-optimal care | Optimal to LTF or death | Suboptimal to optimal care | Suboptimal to LTF or death |
|----------------|-----------------------------|-------------------------|----------------------------|----------------------------|
|                | HR (95% CI)                 | HR (95% CI)             | HR (95% CI)                | HR (95% CI)                |
| Age (10 years) | 0.90<br>(0.86, 0.94)        | 1.11<br>(0.98, 1.26)    | 1.12<br>(1.09, 1.17)       | 1.09<br>(0.98, 1.20)       |
| Male           | 0.72<br>(0.65, 0.79)        | 1.04<br>(0.74, 1.46)    | 1.18<br>(1.09, 1.28)       | 0.92<br>(0.75, 1.12)       |
| IDU            | 1.91<br>(1.74, 2.10)        | 1.10<br>(0.99, 1.24)    | 0.72<br>(0.66, 0.78)       | 1.27<br>(1.03, 1.56)       |
| Race           |                             |                         |                            |                            |
| Aboriginal     | 1.87<br>(1.61, 2.17)        | 1.20 (0.98, 1.46)       | 0.64<br>(0.56, 0.74)       | 1.87<br>(1.44, 2.44)       |
| Unknown        | 0.75<br>(0.63, 0.89)        | 0.85<br>(0.68, 1.06)    | 1.01<br>(0.87, 1.17)       | 1.00<br>(0.74, 1.33)       |

## EPH78

### HIV TESTING DIFFERENCES AMONG ABORIGINAL AND NON-ABORIGINAL INJECTION DRUG USERS IN ONTARIO, 2011: RESULTS FROM PHAC'S I-TRACK SURVEILLANCE SYSTEM

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Toronto, ON

**BACKGROUND:** There is limited recent information regarding HIV testing among aboriginal and non-aboriginal IDU in Ontario. This analysis was conducted to examine differences in HIV testing between aboriginal and non-aboriginal IDU in order to identify the need for aboriginal specific approaches to encourage HIV testing.

**METHODS:** Data were collected in 2011 as part of PHAC's I-Track surveillance system. Interviewer-administered surveys and blood spot collection (for HIV and HCV testing) were conducted at service sites in Kingston (n=197), London (n=202), Sudbury (n=146), Thunder Bay (n=136) and Toronto (n=260). Participants were at least 16 years old and injected drugs in the previous six months. Differences were tested using Pearson's chi-square and Fisher's exact.

**RESULTS:** Lifetime testing was highest in Kingston (97.0%), Toronto (95.8%) and Sudbury (91.8%), and comparatively lower in London (86.1%) and Thunder Bay (82.4%). No differences between aboriginal and non-aboriginal IDU were observed. In Kingston and Toronto, 100% of aboriginal participants reported previous testing, compared to 96.2% and 94.7%, respectively, of non-aboriginals. In Thunder Bay, just 80.0% of aboriginal participants reported testing compared to 87.0% of others. In terms of recent testing, differences were noted in Sudbury and Toronto. In Sudbury, 84.0% of non-aboriginal participants had an HIV test in the previous year while 67.9% of aboriginal participants did so (p=0.030). In Toronto, 63.8% of non-aboriginal participants tested in the last year compared to 73.9% of aboriginal participants (p=0.047).

**CONCLUSIONS:** While there were few differences in HIV testing between aboriginal and non-aboriginal IDU, results were limited by small sample sizes (as these data can be expensive and logistically challenging to collect). More research is required to determine any substantial differences. Of concern is the lower lifetime testing prevalence in London and Thunder Bay, where more than one in ten IDU reported never having an HIV test in their lifetime.

## EPH79

### INCARCERATION WITHIN THE ONTARIO HIV TREATMENT NETWORK COHORT STUDY

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Incarcerated individuals represent a population at risk for HIV and its complications. Factors associated with incarceration amongst HIV infected persons within the Ontario HIV Treatment Network Cohort Study (OCS) were explored by cross sectional analysis. We used a proxy measure of incarceration, defined as having a history of at least one available lab result from any correctional facility in Ontario. As of December 31, 2013 a total of 6,408 persons had been enrolled – 5,585 were linked to Public Health Laboratory of whom 118 had at least one such test sent from a correctional facility. Differences were seen between incarcerated group vs. non-incarcerated: MSM 20% vs 67%; aboriginal 8% vs. 20%; East/North region of Ontario 43% vs. 18%; history of IDU 72% vs. 15%; HCV positive 78% vs. 17%; current smoker 83% vs. 37%; recent hazardous drinking 42% vs. 33%. Incarcerated persons were also more poor and less well educated. No clear differences in treatment uptake or outcome were evident – possibly related to insufficient numbers. Persons in OCS who are known to have been incarcerated are at risk for poor outcomes. Identifying barriers to access and interruptions in treatment cascade will be important for persons coping with HIV in prison.

## EPH80

### YOUNGER AGE AND INJECTION INITIATION AMONG STREET-INVOLVED YOUTH WITH A HISTORY OF BEING IN GOVERNMENT CARE

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 Vancouver, BC

**BACKGROUND:** Health-related disparities experienced by youth exposed to the child welfare system are well documented. However, less is known about whether this vulnerable population initiates behaviours associated with HIV infection, such as injection drug use, at an earlier age. The current analysis examines initiating injection drug use before age 18 and exposure to the child welfare system among street-involved youth.

**METHODS:** Data were derived from a prospective cohort of street-involved youth who use illicit drugs, the At-Risk Youth Study. Multivariate logistic regression analysis was employed to examine the relationship between early initiation of injection drug use and child welfare exposure.

**RESULTS:** Between September 2005 and May 2013, 581 street-involved youth who use injection drugs were surveyed. Among these, 229 (39%) reported initiating injection drug use before age 18. In multivariate analysis, controlling for a range of potential confounders including indicators of childhood trauma and parental substance use, being exposed to the child welfare system remained significantly and positively associated with initiating injection drug use before 18 years of age (adjusted odds ratio [AOR]=1.98; 95% confidence interval [CI]: 1.37–2.85).

**CONCLUSIONS:** Even after adjusting for risk factors associated with being placed in government care, youth exposed to the child welfare system were significantly more likely to initiate injection drug use before age 18. Given the heightened risk of contracting HIV and experiencing other drug-related harms, there is a pressing need for systematic reform of the child welfare system and early interventions for high-risk youth to prevent initiation into injection drug use.

**Table 1. Descriptive statistics stratified by age at injection initiation (<18/≥18). Bivariate and multivariate analyses of factors associated with initiating injection drug use before age 18 (n=581)**

| Characteristic                        | Age at Injection Initiation <18 (n=229, 39%) | Age at Injection Initiation ≥18 (n=352, 61%) | Odds Ratio (95% CI <sup>a</sup> ) | p-value | Adjusted Odds Ratio (95% CI <sup>a</sup> ) | p-value |
|---------------------------------------|--|--|-----------------------------------|---------|--|---------|
| <b>Child welfare exposure</b>         |  |  |                                   |         |  |         |
| Yes                                   | 136 (59%)                                    | 151 (43%)                                    | 1.95 (1.39–2.73)                  | <0.001  | 1.98 (1.37–2.85)                           | <0.001  |
| No                                    | 93 (41%)                                     | 201 (57%)                                    |                                   |         |  |         |
| <b>Gender</b>                         |  |  |                                   |         |  |         |
| Female                                | 79 (35%)                                     | 103 (29%)                                    | 1.27 (0.89–1.82)                  | 0.184   | 1.21 (0.82–1.77)                           | 0.338   |
| Male                                  | 150 (65%)                                    | 249 (71%)                                    |                                   |         |  |         |
| <b>Ethnicity</b>                      |  |  |                                   |         |  |         |
| Caucasian                             | 170 (74%)                                    | 249 (71%)                                    | 1.17 (0.80–1.70)                  | 0.416   | 1.36 (0.91–2.04)                           | 0.133   |
| Other                                 | 59 (26%)                                     | 101 (29%)                                    |                                   |         |  |         |
| <b>Guardian alcohol/substance use</b> |  |  |                                   |         |  |         |
| Yes                                   | 206 (90%)                                    | 340 (97%)                                    | 0.30 (0.14–0.64)                  | 0.002   | 0.35 (0.16–0.76)                           | 0.008   |
| No                                    | 22 (10%)                                     | 11 (3%)                                      |                                   |         |  |         |
| <b>History of sexual abuse</b>        |  |  |                                   |         |  |         |
| Yes <sup>b</sup>                      | 46 (20%)                                     | 57 (16%)                                     | 1.32 (0.86–2.03)                  | 0.210   | 1.06 (0.66–1.71)                           | 0.798   |
| No <sup>b</sup>                       | 172 (75%)                                    | 281 (80%)                                    |                                   |         |  |         |
| <b>History of physical abuse</b>      |  |  |                                   |         |  |         |
| Yes <sup>b</sup>                      | 63 (28%)                                     | 82 (23%)                                     | 1.32 (0.90–1.93)                  | 0.162   | 1.11 (0.73–1.68)                           | 0.633   |
| No <sup>b</sup>                       | 153 (67%)                                    | 262 (74%)                                    |                                   |         |  |         |

<sup>a</sup> CI = Confidence Interval;

<sup>b</sup> Variable coded 'yes' if participant reported abuse by relative or close family friend; 'no' if never reported abuse or abused by someone other than relative or close family friend



## Epidemiology and Public Health: Other

## Épidémiologie et santé publique : Autres

## EPH81

## FERTILITY RELATED CORRELATES OF UPTAKE OF FAMILY PLANNING SERVICES AMONG WOMEN OF REPRODUCTIVE AGE IN NIGERIA

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This study was aimed at examining the association between the age of women at first marriage and uptake of contraceptive services among women of reproductive age (15-49 years) in Nigeria.

This study involved a re-analysis of 2008 Nigeria demographic and health survey (NDHS) data set. This is national surveys and the design used was a cross-sectional population based study design. The primary data obtained from the survey were collected with interviewer administered questionnaires. Data was summarized as proportion and graph was used in representing current contraceptive use by age at first marriage. A chi square was used to assess association between variables. Level of significant was set at 5%.

The total numbers of respondents studied were 13,678. Result showed that only 14.7% of the respondents were currently using a method, majority of the respondents (40.5%) were between the age group 25-34, 47.4% had no formal education, 43.2% married at age (15-19). The following characteristics of respondents were found to be associated with contraceptive uptake: being 25 and above years [O.R = 2.25; 95%CI=1.94-2.61] and [OR= 2.50; 95% CI=2.15-2.90] for women aged 25-34 and 35-49 respectively, having at least a form of formal education [OR= 4.96; 95% CI= 4.24-5.79], [OR= 8.47; 95% CI = 7.32-9.81] and [OR=13.53; 95% CI=11.37-16.11] for primary, secondary and tertiary education respectively, being married at the age 14 and below [OR= 0.23; 95% CI= 0.20-0.27]. Findings from this study showed that a high proportions of sexually active women aged 15-49 years in Nigeria are currently not using a method of contraceptive despite widespread of the knowledge of the services. There is an urgent need to address this through improved political will, promotion of girl child education, empowerment of female so as to achieve millennium development goals.

## EPH82

## PERSPECTIVES OF PEOPLE LIVING WITH HIV CONCERNING ACCESS TO HEALTHCARE: A SCOPING REVIEW

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**CONTEXT:** Strategies to improve access to healthcare for people living with HIV (PLWH) have demonstrated limited success. Whereas previous approaches have been informed by the views of health providers and decision-makers, it is believed that incorporating patient perspectives into the ways we design and evaluate healthcare programs will lead to improved access and connections to healthcare services.

**OBJECTIVES:** To map the literature on the perspectives of PLWH concerning access to healthcare services; identify gaps in evidence, and to produce an evidence-informed research action plan to guide LHIV program of research.

**METHODS:** This scoping review includes peer-reviewed and grey literature from 1946 to May 2014 using double extraction. Variations of the search terms "HIV", "patient satisfaction" and "health services accessibility" were used to include relevant literature. The search strategy was developed in consultation with content experts, review methodologists and a librarian, and validated using "gold standard" studies identified by those stakeholders. Inclusion criteria were: 1) study includes the perspectives of PLWH 2) study design includes qualitative, quantitative, and mixed methods, and 3) outcome measures are limited to patient satisfaction, their implied needs, beliefs and desires in relation to access to healthcare. The papers were extracted by two independent reviewers, and

quality of extracted papers was assessed. Data was collated, summarized and thematically analyzed.

**RESULTS:** Of the 20,694 references retrieved, 326 documents were identified as eligible in pre-screening and 67 articles met the inclusion criteria (54% qualitative studies, 39% quantitative studies and 7% mixed-method studies). Only four studies were conducted in Canada. Data extraction and synthesis in progress (ready for presentation at conference).

**CONCLUSION:** This scoping review recorded and characterized the extensive body of literature on perspectives of PLWH regarding access to healthcare. A literature repository was developed to assist stakeholders, decision-makers, and PLWH in developing and implementing patient-oriented healthcare programs.

## EPH83

## PREFERENCES FOR ATTRIBUTES OF ANTIRETROVIRAL DRUGS FROM THE PERSPECTIVE OF PEOPLE LIVING WITH HIV

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**BACKGROUND:** Patient-centred perspectives are important for determining what people living with HIV (PLWH) value when making choices. We used a discrete choice experiment to elicit preferences from PLWH about the relative importance of attributes of antiretroviral drugs.

**METHODS:** Participants selected their preferred antiretroviral regimen based on six attributes: efficacy in suppressing viral load, cardiovascular risk, wrist and hip fracture risk, mood effects, pill burden, and potential for future resistance. Each choice set consisted of 3 hypothetical regimens characterized by varying levels of these attributes. Participants completed 16 sets and a consistency test; we excluded participants with inconsistent responses. We recruited participants from clinics and AIDS service organizations, analyzed responses using mixed logit regression, and expressed results as how much inefficacy (increased risk of virologic failure) participants would be willing to accept to avoid negative attributes.

**RESULTS:** We analyzed data from 127 of 135 participants. Participants were willing to accept some inefficacy (risk of virologic failure) to avoid less convenient dosing, viral resistance, and all toxicities except wrist fracture. Participants were willing to accept a regimen that was 38.4% less effective (95% confidence interval [95CI] 25.6-51.1) but without cardiovascular toxicity than one with a greatly increased heart attack risk. To avoid a regimen with a high chance of future resistance (compared to almost zero), participants were willing to accept regimens that were 38.3% less effective (95CI 25.6-50.9). Participants were willing to accept one pill once daily regimens that were up to 11.5% (95CI 5.6-17.4) less effective than regimens with greater pill burdens. The greatest heterogeneity of responses was for preferences about cardiovascular risk, mood, and risk of resistance.

**CONCLUSION:** PLWH are willing to accept regimens that are significantly less effective to avoid major toxicities and many are concerned about resistance. The heterogeneity of preferences indicates the need for multiple treatment options.

## EPH84

## VALIDATION OF THE PATIENT ASSESSMENT OF CHRONIC ILLNESS CARE (PACIC) SURVEY FOR CHRONIC HIV CARE

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**BACKGROUND:** The Patient Assessment of Chronic Illness Care (PACIC) survey assesses patient-centredness of care delivered through the Chronic Care Model. The PACIC provides an overall score as well as subscale scores for five areas of care (patient activation, decision support, goal setting, problem-solving, and follow-up), and has been validated in many chronic diseases including diabetes, cardiovascular disease and mental health, but not for HIV.

**OBJECTIVE:** This pilot study aimed to investigate the validity of PACIC in chronic HIV care.

Sample: English-speaking HIV+ adults attending the provincial HIV clinic between January and July 2014 (n=95).

**METHOD:** A telephone survey was administered to consenting, eligible patients. The survey included items from the PACIC, socio-demographic characteristics, and additional questions assessing satisfaction with care. The survey was pretested for face and content validity. Results presented are for PACIC items only. Internal consistency was evaluated using Cronbach's alpha. Inter-item correlation between overall PACIC score and subscales was assessed using Pearson correlation. Factorial structure was examined by factor analyses of complete cases. Score associations with sociodemographic characteristics were evaluated using T-test and ANOVA.

**RESULTS:** Response rate was 52% (49/95 patients). Overall mean (sd) PACIC score was 3.11 (0.83) out of 5, with subscale scores ranging between 2.91 (1.13) and 3.97 (1.11). The Pearson correlation between overall score and the subscales ranged from 0.57 to 0.86. Cronbach's alpha was 0.87 (range: 0.61 and 0.77 for subscales). Exploratory factor analyses for PACIC and subscales distinguished a 5 factor model, explaining 80% of the variation. Scores were not associated with age, sex, years living with HIV, living in rural area or type of clinic attended ( $P > 0.05$ ).

**DISCUSSION:** The PACIC has good face and construct validity in chronic HIV care. Validation in a larger population of HIV+ patients is warranted.

## EPH85

### DEVELOPING MATCHED COHORTS FOR STUDIES ABOUT HIV IN CANADA: THE IMPORTANCE OF METHODOLOGICAL CONSIDERATIONS

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**INTRODUCTION:** Matched cohort studies are increasingly common across health disciplines. The unique socio-demographic characteristics of people living with HIV make generalized comparisons to population data challenging. Ensuring that comparisons between data collected from people living with HIV and 'control' data do not overlook possible confounders is tantamount to a well-designed study.

**METHODS:** This abstract draws on recent discussions regarding the development of matching criteria to form matched cohorts of HIV negative women for the HIV Mothering Study and the Angiogenesis and Adverse Pregnancy Outcomes (AAPH) studies in Ontario, Canada.

**RESULTS:** Our analysis focuses on the methodological and logistical challenges of developing matched cohorts that permit robust comparison analyses, while balancing feasibility challenges associated with matching. These challenges relate to: identifying requisite matching criteria to ensure reliability of the matched results, particularly in the field of basic science; selecting matching criteria that are specific, such that the comparative results will be reliable, but not prohibitive in terms of finding a suitable match; considering what comparators will be of interest for analysis and excluding these criteria for matching; and exploring the suitability of recruitment sites for matched cohorts to optimize recruitment success. Furthermore, in reflecting on our decision making processes, ethical challenges associated with matching diverse groups of women who are marginalized on a range of issues, including the matching criteria that were selected, have also emerged as an important considerations.

**CONCLUSION:** The need for matched cohorts in HIV research will continue to grow. Tackling the challenges associated with this methodology, and developing a strong knowledge base in the experience of matching, will facilitate improved research processes and successful outcomes. Both methodological and ethical tensions must be fully addressed in order to do so.

## EPH86

### LIVING LONGER WITH HIV: CHARACTERISTICS OF PERSONS IN LONG-TERM CARE AND HOME CARE POPULATIONS

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**BACKGROUND:** This study describes the sociodemographic, clinical and social attributes of persons living with HIV/AIDS (PHA) in home and institutional care settings in Ontario. Population aging and successful drug therapy in HIV management mean that more people are living longer with HIV presenting an emerging public health trend. As these individuals age, they become more at risk of developing other chronic health

conditions which can have implications for disease management. Aging PHA may require more care in both the home and institutional settings.

**METHODS:** This quantitative analysis used secondary data collected from the interRAI home care and minimum data set instruments in Ontario between 2003 and 2011. The total sample included 837,652 individuals. Descriptive analysis was used to outline key attributes of people living with and without HIV in long-term care (LTC), complex continuing care (CCC), and home care (HC) settings. Differences between PHA across the three settings were compared using Chi-square analysis.

**RESULTS:** 1,091 PHA were identified (4.4%, 32.6% and 63.0% in LTC, CCC and HC, respectively). PHA were predominantly male and much younger than others in all three settings; in CCC, more than 70% of PHA were younger than 54 years. PHA were less likely to be married, had less comorbidity and physical impairment and poorer self-rated health than other populations in the same care settings. PHA also exhibited more social isolation, had more conflicts with others and received more psychotropic medications.

**CONCLUSIONS:** Aging PHA represent a complex population with distinctive health needs. A better understanding of these needs will help to develop strategies to provide better care across care settings and improve the quality of life of this group. InterRAI standardized assessment instruments may be important tools for benchmarking, evaluating, and quality measurement. As a continuation of this project, a larger analysis across Canada is underway.

## Social Sciences: Aboriginal Health

## Sciences sociales : Santé des Autochtones

## SS01

### USING DIGITAL STORYTELLING TO UNDERSTAND ABORIGINAL CONSTRUCTIONS OF HOUSING AND HOME: STABLE HOMES, STRONG FAMILIES

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**BACKGROUND:** Housing instability is a complex issue and important determinant of health for Aboriginal people affected by HIV and AIDS across Canada. Aboriginal people often live in housing that incorporates Eurocentric constructs of family and home in the design. Stable Homes, Strong Families (SHSF) is a community-based research (CBR) project that aims to develop cultural understandings of housing and home amongst Aboriginal people to influence housing programs and policies.

**OUR APPROACH:** Digital Storytelling (DS) was chosen as a medium to explore cultural understandings and meanings of home because of its participatory, arts-based approach that increases community involvement in the research process. Five workshops were held with 22 participants across Canada from June 2013 to November 2014.

**FINDINGS:** DS is an engaging methodology to explore cultural understandings of housing and other issues that intersect with meanings of home and family amongst Aboriginal peoples across Canada. The DS workshops highlighted a number of important issues when conducting CBR with Aboriginal communities. Sufficient time must be invested for local promotion and recruitment, especially to understand the needs of workshop participants, and for the planning committee to adapt the workshop template to the local context. Early engagement with an Elder and community supports is essential to creating a safe space for all involved and to ensure local Aboriginal cultural protocols are respected. Although there is tremendous opportunity to integrate ceremony throughout the workshop, our team recognizes the tension between the heavy reliance on technology for DS and our commitment to Aboriginal oral traditions and decolonizing methodologies.

**IMPLICATIONS:** DS workshops are more than an arts-based methodology to collect data and must be carefully planned and executed. DS is complementary to Aboriginal oral traditions, however the tensions and

limitations of employing DS as a decolonizing research approach will continue to be discussed amongst the SHSF team.

## SS02

### KNOWLEDGE OF HIV TESTING VIA BLOOD TEST AMONG ABORIGINAL CANADIANS

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**INTRODUCTION:** While there is much research regarding HIV testing in aboriginal and general populations, less information exists regarding knowledge of HIV testing. This study was conducted to investigate differences in HIV testing knowledge among groups of aboriginal Canadians.

**METHODS:** In 2012, PHAC conducted a national telephone survey to examine HIV attitudes and knowledge among the general Canadian population (including First Nations Canadians living on reserves). Interviews were conducted at EKOS call centres in Ottawa. Up to eight call-backs were made to unresponsive contacts, with follow-up calls made on successive days at varying times (respondents also had the option to reschedule). Daily records were kept of all calls made, whether successful (completed or rescheduled interviews) or not. Data were extracted via the Open Data portal of the Government of Canada, with Pearson's chi-squared and Fisher's exact used to examine differences ( $n=411$ ).

**RESULTS:** Overall, knowledge of HIV testing via blood test varied significantly between aboriginal groups ( $p<0.001$ ). More than 90% of First Nations Canadians correctly knew that HIV could be diagnosed by a blood test. While on-reserve First Nations individuals were slightly more knowledgeable (with 96.1% answering correctly) than those living off-reserve (91.4%), the difference between these groups was not significant. In addition, Métis individuals also demonstrated high levels of knowledge, with 95.1% answering correctly. However, among Inuit Canadians, knowledge was particularly low. Just 80.4% of respondents knew that HIV could be diagnosed by blood test.

**CONCLUSIONS:** Though knowledge was high among other aboriginal groups surveyed, one in five Inuit Canadians were unaware that HIV could be diagnosed by a blood test. This finding may have been influenced by cultural or language barriers, as well as limited by small sample sizes. Results (while limited by small sample sizes) demonstrate a need to re-evaluate knowledge translation and health promotion efforts among this population.

## SS04

### THE CEDAR PROJECT: LEARNING FROM YOUNG PREGNANT-INVOLVED ABORIGINAL MOTHERS IN THREE CANADIAN CITIES ABOUT THE SOCIAL DETERMINANTS OF SUBSTANCE USE

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**OBJECTIVES:** To present a new evidence-based model of the social determinants of substance use during pregnancy among young Aboriginal women that honours the perspectives and voices of Aboriginal women.

To provide new perspectives on substance use during pregnancy to inform future policy and health services initiatives for Aboriginal families in Canada.

**APPROACH:** A convergent mixed-methods approach was used to develop the model. The data collection and analysis consisted of:

- a secondary data analysis
- life history interviews
- an innovative pilot participant-generated mapping exercise CIRCLES (Charting Intersectional Relationships in the Context of Life Experiences with Substances) developed by the author.

Results from all three studies were combined to inform the creation of a new model of the social determinants of substance use during pregnancy.

**RESULTS:** Current models of substance use during pregnancy do not account for the complex influences in young Aboriginal women's lives. This new model highlights the importance of acknowledging and attending to the downstream impacts of colonialism, the impact of intergenerational trauma and harm, and the necessity of maintaining the mother-child unit. Intersectionality provides a necessary lens for understanding how the determinants interact to influence substance use during pregnancy, while

the model explicitly highlights resiliency factors that support families. Poverty is understood as major contributor in the model, while the inclusion of distal, intermediate and proximal determinants as nested influences on substance use allows for an exploration of the drivers of inequality. **CONCLUSION:** There is an urgent need to understand the social, political and historical contexts of substance use during pregnancy among young Aboriginal women. By creating this evidence-informed model, effective points for intervention and policy change can be identified, while increased support for women's resiliency factors and strength can be provided.

## SS05

### THE CEDAR PROJECT: RESILIENCY AND SEXUAL VULNERABILITY AMONG YOUNG ABORIGINAL PEOPLE WHO USE DRUGS IN A RURAL COMMUNITY IN INTERIOR BRITISH COLUMBIA

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<sup>1</sup>Vancouver; <sup>2</sup>Enderby; <sup>3</sup>Prince George, BC

**BACKGROUND:** Indigenous leadership and residents of remote and rural areas in interior BC are concerned about lack of research that addresses sexual and drug related vulnerabilities among young Aboriginal people in their communities.

**METHODS:** The Cedar Project is an ongoing prospective cohort study of young Aboriginal people (aged 14-30) who use drugs in Vancouver, Prince George, and Chase. Cross-sectional data was collected on drug use, resiliency and sexual risk. Participants completed the 28-item Childhood Trauma Questionnaire (CTQ) and the 25-item Connor-Davidson Resilience Questionnaire (CD-RISC) between 2011-2012.

**RESULTS:** Of the 340 participants in Prince George and 104 in Chase, many were taken away from their biological parents (63% and 44%,  $p<0.0001$ ), and had parents who were in residential schools (46% and 37%,  $p=0.0762$ ). Those in Chase scored higher on the resilience scale (64 vs. 60), and had lower frequency and severity of all abuse types: emotional abuse (43% vs. 28%), physical abuse (41% vs. 27%), and sexual abuse (45% vs. 22%). Injection drug use among Chase participants was much lower (52% vs. 11%,  $p<0.0001$ ). Among participants who injected drugs, 2 of the 8 participants in Chase, and 13 of the 166 participants in Prince George tested positive for HIV ( $p=0.5374$ ). 2 of the 8 participants in Chase and 96 of the 166 participants in Prince George tested positive for HCV ( $p<0.0001$ ). While alcohol consumption was higher in Chase (91% vs. 82%,  $p=0.0212$ ), more Prince George participants reported experiencing non-consensual sex (50% vs. 27%,  $p<0.0001$ ; average age at first experience 7.7 years and 10.5 years) or engaging in sex work (38% vs. 18%,  $p<0.0001$ ; average age at initiation 16.9 years and 19.3 years). There was no difference in sexual risk (63% vs. 64%).

**CONCLUSION:** Young Aboriginal people in Chase have lower levels of injection drug use but have elevated levels of alcohol consumption, and sexual vulnerability. Sexual health education and programming is urgently required in this rural community.



## Social Sciences: Combining Prevention Strategies: Social Scientific Perspectives

### Sciences sociales : Combinaison des stratégies de prévention : perspectives des sciences sociales

#### SS06

##### UNDERSTANDING ACCESS TO PREVENTION STRATEGIES: TAKING THE FIRST STEPS TOWARD COMBINATION HIV PREVENTION FOR MSM IN MONTREAL

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**BACKGROUND:** Combining behavioural, biomedical, and structural prevention strategies has shown promise as a way to reduce HIV incidence in the gay community. A prerequisite for combining these strategies is that they be accessible to community members.

**OBJECTIVE:** Discuss barriers identified in the context of an exploratory study with respect to accessing and combining prevention strategies.

**METHOD:** A intersectoral committee composed of 30 participants (clinicians, researchers, community and public health stakeholders) was formed to identify current challenges for HIV prevention in Montreal's gay community and propose models for implementing a combination prevention approach. Using ethnographic methods, an analysis was undertaken of the accessibility of different prevention services from the perspective of a gay man wishing to access to them. A cartography of all available services was developed and an initial assessment was made from a systems perspective in relation to five dimensions of accessibility: approachability; acceptability; availability / accommodation; affordability; appropriateness / adequacy (Lévesque et al. 2013).

**RESULTS:** Committee discussions and results from the cartography showed that in theory, numerous prevention services are offered to gay men in Montreal, either separately or in combination. In reality, problems were identified in relation to all five dimensions of accessibility and particularly with respect to approachability, acceptability, and appropriateness / adequacy. Results from the cartography were subsequently used to develop indicators that will be useful for a more comprehensive assessment in the future.

**CONCLUSION:** In order for a combination HIV prevention approach to be operationalized, problems with the accessibility of programs and services must be addressed, in particular a systemic lack of integration and coordination among stakeholders working in different sectors. The conceptual framework and methodology developed for this study could be useful in other locations within Canada or elsewhere as part of broader-based reflection on the potential and challenges of combination prevention.

#### SS07

##### SUPPORTING POPULATION- AND DISEASE-SPECIFIC PREVENTION AS PART OF AN INTEGRATED APPROACH TO STBBI PREVENTION

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**BACKGROUND:** An integrated approach to sexually transmitted and blood borne infections (STBBIs) focuses on common transmission routes, risk behaviours and social and structural risk factors. However, the unique impact of specific infections on certain populations highlights a need for population- and disease-specific prevention within an integrated approach. Two examples are chlamydia infection among young women and syphilis infection among gay men and other men who have sex with men (MSM), where rates across Canada are on the rise.

**METHOD:** A comprehensive review of existing evidence on chlamydia and syphilis and other STBBI prevention interventions was conducted to inform the development of two population-specific prevention resources.

**RESULTS:** Based on a review of the evidence, prevention strategies for both chlamydia and syphilis include the application of elements of the Information, Motivation, Behavioural Skills model to promote and support increased awareness and behaviour change, in addition to challenging STBBI-related stigma. Disease-specific prevention strategies for chlamydia among young women include using interactive strategies to deliver information and teach skills and enhancing personal perception of risk, and for syphilis among gay men and other MSM include increasing testing and innovative approaches to partner notification.

**CONCLUSION:** Within an integrated approach, effective STBBI prevention takes into account the specific impact of specific infections on certain populations. It also considers the social, structural and economic factors that increase vulnerability to STBBIs and includes a combination of upstream, primary, secondary, and tertiary prevention interventions. Expanding the scope and understanding of promising practices and identifying knowledge gaps through program evaluation are important for an effective response to chlamydia and syphilis infection.

#### SS08

##### EXPLORING THE OPINIONS OF HIV-NEGATIVE MSM ON PRE-EXPOSURE PROPHYLAXIS (PREP) THROUGH QUALITATIVE INTERVIEWS

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**BACKGROUND:** Pre-exposure prophylaxis (PrEP) has generated considerable interest as a strategy for preventing HIV among gay, bisexual and other men who have sex with men (MSM). As its clinical delivery gets underway in Canada, further input from potential PrEP users and the broader MSM community is needed on how PrEP is perceived and how it should be delivered.

**METHODS:** Working within a grounded theory and method framework, we conducted thirty qualitative interviews about PrEP with adult MSM from the Toronto area who self-identified as HIV-uninfected. Participants were recruited through a busy sexual health clinic largely servicing the gay community, and completed a brief questionnaire including a validated HIV risk index for MSM (HIRI-MSM) prior to the interview. Interviews were audio recorded and transcribed and averaged about one hour in length.

**RESULTS:** Median (interquartile range, IQR) age was 34.5 (27,44) years, 70% were of European descent, and all identified as gay (n=28) or bisexual (n=2). Participants reported a median (IQR) of 12 (6,30) male partners in the preceding 6 months and 73% scored >10 on the HIRI-MSM, indicating substantial risk of HIV seroconversion. Key issues discussed include 1) criteria for determining PrEP eligibility, 2) how to communicate with users about combining PrEP with condoms and other prevention methods, and 3) the potential for PrEP-related stigma. While data analysis is ongoing, preliminary results additionally include clinical concerns about PrEP (eg. adherence, side effects, risk of other sexually transmitted infections, financial cost), as well as variable perceptions of HIV risk, disclosure of both HIV status and PrEP use, and indirect benefits of PrEP use.

**CONCLUSIONS:** The input of potential PrEP users is valuable for PrEP delivery. Further work is needed to understand the opinions of key at-risk populations and how PrEP programming can best address their concerns.

## Social Sciences: Critical Social Theory: Applications and Advancements in Understanding the HIV Epidemic

## Sciences sociales : Théorie sociale : Applications et progrès dans la compréhension de l'épidémie de VIH

SS09

### CHICOSNET (CN) FOCUS GROUP EVALUATION OF "HANDS NARRATIVES" (HN), AN INNOVATING INQUIRING QUALITATIVE ETHNO-RACIAL METHOD FOR HIV KNOWLEDGE: EXPLORING THE SEXUAL LIFE EXPERIENCES OF SPANISH-SPEAKING GAY MEN (SPPGM) IN CANADA

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**PLAIN LANGUAGE SUMMARY:** Developing new qualitative methods created from communities for communities is a challenging process. HN is a community-based method that was evaluated in a focus group in order to understand the more efficient use of meaningful methodologies for developing HIV ethno-racial prevention efforts.

**ISSUES:** Program Science new approach in HIV requires a better use of resources, methodologies and methods. How to understand emerging community needs and how to better evaluate qualitative efforts has been an issue, particularly where immigration status and language barriers could be in the way of effectively communicating participant's life experiences.

**DESCRIPTION:** 15 HN were conducted within the context of two CN groups (2013-2014). In HN the hands are used as metaphors for understanding intersectionalities, life events and sexual desires, pleasures and passions narratives. In order to gain more information, HN methodology was presented in CN (Oct-Nov 2014 group) for open discussion, themed identification and evaluation. (n=10: 7 Venezuelan, 1 Brazilian, 1 Salvadorian, 1 Colombian). The focus group was audio recorded (41'48").

#### RESULTS:

- HN is an excellent method for sharing experiences related to sexuality, desires, life events-trajectories and intersectionality.
- Allow participants naming and narrating their major issues such as: migration, "coming out", falling in love, HIV infection, sexual pleasures and sexual health practices.

#### LESSONS LEARNED:

- HN is appropriated for depicting personal sexual health narratives using a visual and colourful format.
- The method allows an easy communication tool for ethno-racialized individuals (even the ones who do not speak official Languages) to communicate and inform sexual health policy making, research and programming, assuring the approach to Program Science guidelines.
- As a community-based method in its early stages, many methodological and qualitative issues are related to this new format. However, HN's major value is that the method was developed at the core of a community program, and it requires minimum economical resources.

SS11

### COMPETING DISCOURSES IN THE SEXUAL SUBJECTIVITIES OF GAY MEN: AN EXAMINATION OF BAREBACKING AND HIV PREVENTION FROM ACTIVISTS' PERSPECTIVES IN NOVA SCOTIA

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**BACKGROUND:** In recent years, barebacking has become a popular focal point within the academic literature aimed at HIV prevention among gay men. From a poststructural standpoint, barebacking has come to signify a tension within the subjectivities of gay men because of the desire to both engage in this practice and to avoid HIV transmission. In ad-

dition, barebacking has become a way in which gay men can be classified as "at risk" within the broader HIV-prevention public health discourse.

**METHODS:** This paper will present the findings of a qualitative research project in Nova Scotia aimed at examining the perspectives of HIV/AIDS activists on the way barebacking is conceptualized and discussed across various sectors including public health, ASOs, physicians and within the gay men's communities. This research employed a Foucauldian discourse analysis to investigate how 17 HIV/AIDS activists experienced living and working in Nova Scotia during the HIV/AIDS movement.

**FINDINGS:** Activists' perspective on barebacking conceptually shifts the practice from an individual, isolated act to a discursive production. Specifically, what emerges in this interpretation is the normalizing effects of both silence and rendering visible barebacking practices and subjectivities in public and private spaces. The effect of silence is to draw the boundaries of discourse, while at the same time, rendering visible the discursive, prevention-focused spaces public health occupies.

**CONCLUSION:** Barebacking discourse is not a completely stable concept and cannot simply be reduced to convincing gay men to wear condoms. The depth of meaning associated with raw sex has evolved significantly during the decades of HIV/AIDS and, as barebacking discourse evolves within the gay male community, the public health and health promotion response must become more nuanced. This nuance involves understanding barebacking as the site where the competing discourses of condomless sex and HIV prevention play out in the lives of gay men.

SS12

### HIV/AIDS AND RISK: APPLYING THEORETICAL CONCEPTS WHEN EXPLORING HOW AND WHY NEWCOMER COMMUNITIES COME TO BE LABELLED "AT-RISK" IN THE CONTEXT OF SEXUAL EDUCATION

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As an Anthropology Master's student, I am interested in how sexual health, HIV/AIDS, and risk discourses are constructed and circulated. I recently attended a World AIDS Day talk at a sexual health organization located in downtown Winnipeg, Manitoba; this event focused on the sexual education of newcomer adults and youth. I am interested in how the connection was drawn between a World AIDS Day talk and newcomer families. In particular, how are newcomer communities explicitly and implicitly linked to HIV/AIDS and risk discourses in sexual education settings? Throughout the various presentations I noticed the language of bureaucracy and bio-pedagogy (revealing the entanglement of citizenship and health); the context of this event was tailoring sexual education programs for particular "clienteles". Even when programs seek to be culturally-appropriate, there is still a sense of rigid institutionalization. This can be gleaned from the way in which sexual education is presented, as unquestionable; there is a right answer and a wrong answer. This was readily apparent in a game called "Risk Rater" that was introduced to the group, which the programmers play with the youth. Every participant is given three pieces of construction paper (one red, one yellow and one green). The presenter would give a scenario, for example kissing, and then everyone had to raise the card that they thought represented the risk level of contracting HIV/AIDS/STI's (respectively high, low, and no). This clearly illustrated how risk is conceptualized in a sexual education setting. There is no room for discussion and the answers are not up for debate. I propose that efforts aimed at the promotion of sexual health and HIV/AIDS prevention can be strengthened by critically reflecting on how these messages are enacted and how they come to target particular communities.

SS13

### MARGINALITY, ILLICIT DRUG USERS AND BLOOD-BORNE INFECTION: A CRITICAL ANALYSIS OF THE HARM REDUCTION PARADIGM IN CANADA

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**BACKGROUND:** Globally, HIV and HCV associated with illicit drug use remain significant health and social care consequences. While harm reduction approaches are well established in Canada, research has begun to question whether current harm reduction practices are sufficient to ad-

dress the ongoing HCV and HIV epidemics among people who use illicit drugs (PWUID), in particular, injecting drug users.

**METHODS:** Applying a Foucauldian interpretation of policy and practice, this paper aims to: i) present an analysis of the developments surrounding harm reduction policies and practices in Canada; ii) articulate connections between elements of Canada's harm reduction paradigm, and the marginalization of PWUID. To accomplish this, we outline the epidemiological context of HIV and HCV relative to a historical analysis of the development of harm reduction efforts in Canada. We examine national debates on harm reduction policy, and point out how particular features of Canada's public policy context are based on attitudes towards harm reduction knowledge, as well as diverse cultural and socio-political contingencies (social movements, institutional interests, legislation, community practices, and anti-pleasure stigma).

**RESULTS:** We find that multiple historical junctures, rather than single causes of social exclusion engender the processes of marginalization of PWUID in Canada. While rhetorics of harm reduction are widespread, a bias towards abstinence and a failure to account for pleasure as a meaningful component of illicit drug use are evident within this discourse. Recommendations for individual, meso, and structural-level intervention strategies to counter the marginalization of PWUID within Canada's harm reduction efforts are proposed.

**CONCLUSION:** Researchers, policy-makers and practitioners are encouraged to consider the utility of a critical Foucauldian stance when reflecting on the elements of a harm reduction approach. Doing so can translate to a renewed attention on the structural context and pragmatics of drug use in Canada, and its intersection with blood-borne infections like HIV and HCV.

## Social Sciences: Engaging (with) Communities in HIV Research

## Sciences sociales : Participation des collectivités à la recherche sur le VIH

### SS14

#### CHICOS NET (CN) FOCUS GROUP PROGRAM EVALUATION OF THE HIV PREVENTION VIDEO TUTURUTU

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**PLAIN LANGUAGE SUMMARY:** A focus group evaluation was conducted as part of the HIV prevention program CN. The process was recorded. A home-made video was developed as an educational effort to depict a "puppet" show, which was presented to the CN group with the idea of collecting individuals feedback and ideas for future prevention efforts. **ISSUES:** Spanish-speaking MSM continue to get infected with HIV in Canada due to the effect of the negative social determinants of health that increase personal vulnerabilities to infection. In Toronto, CN a Canadian HIV prevention intervention, evaluated the video that intended to involve communities, raise HIV prevention awareness (particularly promoting condom use during intercourse) and to adopt social media as health promotion tools.

**DESCRIPTION:** An educational video called Tuteurutu created with the idea of generating condom use promotion among MSM, gay and bisexual communities. Although, created for Spanish-speaking men, the video use a non-specific language allowing increase its impact by communicating the message to individuals from any language background. The video's length is 1:03". The video also promotes the different services available at HPP-CSSP. This project was evaluated using a focus group method with a cohort of CN, an HIV behavioural intervention. (n=10, 7 Venezuelan, 1 Brazilian, 1 from El Salvador, and 1 Colombian).

**RESULTS:** Participants had a 23' conversation. They expressed what they understood the message from the video to be, and they discerned the rationales of what they considered plausible from the video. Finally, they discussed things they would have done differently for increasing clarity and message scope.

### LESSONS LEARNED:

- All participants agreed that using social media, particularly "funny" videos depicting puppets is a good educational strategy to create opportunities for community dialogue.
- Some participants talked about the need to put more emphasis in showing condoms and the benefits of using condoms to reduce HIV/STI's infections.

The video was posted on different social media networks on December 1st. World's Aids Day.

### SS15

#### USING THE MEDICINE WHEEL IN SYMBOL-BASED INQUIRY: AN INDIGENIZING APPROACH USED IN THE TWO-SPIRIT HIV/AIDS WELLNESS AND LONGEVITY STUDY (2SHAWLS)

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**BACKGROUND:** Community-based research with Canadian Aboriginal communities seeks to map Indigenous worldviews and develop anti-colonial research approaches. However, less attention has focused on how Indigenous knowledges might influence data collection and analysis. The Medicine Wheel (MW), a common North American Aboriginal symbol, represents an individual's healing journey in balancing the four aspects of self (physical, emotional, mental and spiritual) with the interconnection to all things. This presentation focuses on how MW teachings were used for data collection, analysis, and knowledge translation to understand the resiliency perspectives of two-spirit males living long-term with HIV/AIDS in Ontario, Canada.

**METHOD:** Aboriginal sharing circles (i.e., focus groups) were used to gather data in three locations (Hamilton, Toronto and Ottawa, Ontario, Canada). Here, the MW was used to solicit stories of participants' healing journeys living with HIV/AIDS (n=14). Data analysis involved several stages: (1) Cross-cultural training on MW teachings and qualitative data analysis were provided; (2) once transcribed, all data expressing similar patterns were coded using NVivo 10; (3) using participatory analysis, selected key quotes were mapped to the MW in areas expressing similar meaning; (4) codes that expressed a relationship to one another were grouped and then labelled consistent with the teachings of the MW; and (5) data visualization was used to present findings using the MW. Validity was established by independently verifying coding work and utilizing member-checking of the tentative findings with our community advisory committee.

**RESULTS:** Culturally-bound symbols potentially provide attuned and structured ways to interpret and understand data and to develop knowledge consistent with Aboriginal worldviews. This potentially facilitates the goal of knowledge translation, exchange and uptake of research findings in communities of interest.

**CONCLUSIONS:** The analytic process described above potentially shifts the way researchers come to understand, write, speak about and present scholarly work focused on Aboriginal HIV/AIDS resiliency through the world views of those most directly affected.

### SS16

#### THE IMPACT OF FOOD SECURITY ON HEALTH OUTCOMES IN PEOPLE LIVING WITH HIV/AIDS IN BRITISH COLUMBIA: PEER RESEARCH ASSOCIATES EXPERIENCE

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**BACKGROUND:** Food insecurity has been associated with increased risk of HIV transmission, delayed treatment access, suboptimal adherence and poor responses to antiretroviral therapy. In order to better understand the prevalence and correlates of food insecurity in British Columbia (BC), we led a pioneering community based research (CBR) study involving AIDS Service Organizations (ASOs) and Peer Research Associates (PRAs). We



describe the philosophy, operational process and lessons learned of this project for knowledge transfer to other CBR initiatives across Canada.

**METHODS:** This study was implemented with the meaningful participation of community members affected by HIV and began in 2009 involving nine ASOs and ten PRAs who coordinated participant recruitment, administered questionnaires, managed honoraria and conducted interviews. Research processes aligned with scientific best practice and ethic approval was obtained from UBC/PHC and SFU.

**RESULTS:** This was the first national HIV CBR study to utilize highly trained PRAs. The study had many successes including: building strong capacity in a team of PRAs, gaining more honest and accurate information from respondents, and shifting the community's perception of the value of research. One major challenge was with PRAs' isolation given the large geographic area covered. The team had many key learnings, including the importance of: engaging PRAs at the beginning of the research process and building a strong and ongoing communication structure between all team members.

**CONCLUSION:** This study demonstrates the invaluable contribution PRAs provide to the research process as well as the many issues that have to be taken into consideration when utilizing peers in research. This study provided the PRAs opportunities to learn new skills interact with their peers in different ways, cross education and de-stigmatization as well as opened up new career opportunities. The lessons collectively learned have informed other CBR projects such as CHIWOS and the Positive Living Positive Homes study.

## SS17

### TAKING THE PULSE: MEASURING PARTICIPANTS' CONFIDENCE FOR RESPONDING TO LOCAL COMMUNITY NEEDS

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**OBJECTIVES:** Through ABRPO's on-going community development initiative 'Turning to One Another' (TTOA), agency staff and peer facilitators from 13 Ontario ASOs continue to increase the capacity of ASOs to build effective working relationships between ASO staff and PHA in multiple roles through the development of training and organizational tools.

**METHODS:** At the February 2014 Provincial Collaborative Practice Development Consultation, both PHA Peer Facilitator trainees and ASO frontline staff (N=37) responded to a two-page needs assessment survey entitled, "Taking the Pulse: TTOA 2014 Pilot Site Check-in". Participants were asked to: describe one-three issues that they perceive are impacting PHAs; how their agency is dealing with these issues; rate their confidence in their ability to respond; and to rate their perception of their agency's ability to respond.

**RESULTS:** The majority of respondents (N=25, 68%) were PHAs who were peer facilitators or employed at ASOs. The most common issue perceived as "impacting HIV+ people in your community" was aging, followed by equal listing of housing, stigma, and medication access issues. In total, 84 descriptions of how their agency is dealing with issues were provided, with a small number identifying a gap in local response. Next, respondents indicated that they were moderately, mostly or highly confident (N= 80, 88%) in their ability to respond to most issues that they identified. Lastly, for most issues identified respondents were moderately, mostly or highly confident (N= 68, 77%) in their agency's ability to respond.

**CONCLUSIONS:** From the high levels of respondents' confidence to address many issues, a strong affirmation of the success of local collaborations and responsiveness can be inferred. Further examination is warranted of areas of challenge identified by respondents who had little or no confidence (N= 20, 23%) in their agencies' ability in addressing community/peer/MSM/PHA involvement, addictions/harm reduction, burnout of peers or leaders, isolation/loneliness, and housing.

## SS18

### SCANNING FOR SILOS: CREATIVE PATHWAYS TO PARTNERSHIPS AND WELLNESS

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The purpose of this presentation is to provide insights into how environmental scans can be used to identify community needs and develop systems

pathways. Northern Health's Blood Borne Pathogens Team has implemented the use of pre-visit environmental scans to gain insight into the broader context of how HIV program integration occurs at the community level. Environmental scans are completed in each community with stakeholders, community members, health care staff, First Nations organizations and peers. Environmental scans are then coded for common themes that identify existing services and supports, identify gaps and challenges, and suggestions for potential solutions. This information is then wrapped in a quality improvement workshop presented in each community with the intended outcome of community led and driven partnerships that work towards integrated sustainable health solutions. This quality improvement initiative highlights the interconnectedness between health care services and the community agencies that foster social cohesion and good health as healthy community partnerships are developed.

The primary objectives of the environmental scans are to:

1. Examine existing services and supports
2. Map existing services in communities
3. Identify gaps and challenges
4. Implement potential solutions

To date the results provide a review system of HIV care and care pathways to ensure all healthcare providers and community partners are supported and have a clearly articulated process as they access services for those living with and affected by HIV. In particular, key trends, such as stigma and the relationship between environmental factors that impact the community, the clients and their families have been identified along the pathway. By the end of the presentation, participants will:

1. Understand how environmental scans are an effective quality improvement tool;
2. Recognize community engagement and relationship building are essential to program integration and partnerships;

## SS19

### HEADS UP! A COMMUNITY-BASED RESEARCH APPROACH TO EXPLORING THE LIVED EXPERIENCE OF HIV-ASSOCIATED NEUROCOGNITIVE DISORDER

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**BACKGROUND:** Despite the high prevalence of HIV-associated neurocognitive disorder (HAND) and many clinical assessment tools, limited qualitative information exists on how people with HAND view, cope with, and speak about cognitive impairments. HEADS UP! is investigating the lived experience of HAND using participatory ethnographic methods at Casey House and St. Michael's Hospital in Ontario and at The Dr. Peter Centre in BC. This study is funded by a CIHR catalyst grant and a REACH grant.

**METHODS:** We audited the steps to bringing experience and expertise together in an interdisciplinary team and the implementation of a CBR strategy that is inclusive of people living with HIV and sensitive to the ecology of community-based organizations. These steps included a) a critical reading of the HAND and qualitative methods literature informed by community, clinical, and academic perspectives; b) the design of an in-depth interview schedule; c) recruitment and training of Peer Research Associates (PRAs); d) the inclusion of clinical screening for HAND; and e) an ongoing KTE strategy.

**RESULTS:** A critical reading of the literature has softened the disciplinary edges of the research team and allowed people with HIV to challenge the boundaries of clinical assessments and practices regarding cognitive difficulties. It has positively impacted the collaborative construction of a) a recruitment strategy that includes clinical screening for HAND but remains flexible to the organizational environment (e.g., increases awareness but not alarm amongst clinicians and participants); b) an open-ended interview schedule that incorporates the constructs regarding memory, attention and thought processes of people living with HIV; c) the training of six peer researchers from Ontario and BC led by a PRA with lived experience of HAND; and d) multimedia HIV/HAND information resources and café scientifique.

**DISCUSSION:** We expect that these CBR steps will effectively engage communities in several aspects of the study to maximize results and sharp-

en the grounded theory analysis of 24 in-depth interviews with participants living with HIV and HAND.

## SS20

### PRACTICING GIPA THROUGH PRA-LED SURVEY ADMINISTRATION

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**BACKGROUND:** There is a paucity of literature exploring the role of Peer-Research Associates (PRAs) in survey administration in the context of Community-Based Research (CBR) studies. As part of a multi-year CBR study evaluating the Dr. Peter Centre (DPC), an integrated health care facility in Vancouver, BC for people living with HIV, two PRAs were hired to administer baseline and follow-up quantitative surveys to study participants.

**OUR CBR APPROACH:** Two PRAs (one DPC client, one external) were hired as DPC staff members to administer a quantitative survey as part of the DPC study. The PRAs are people living with HIV who identify as having shared backgrounds with DPC clients, including current and past experience with mental health challenges, homelessness, and illicit substance use.

**PROGRESS:** Following hiring, PRAs participated in a comprehensive 3-day training program led by a Peer Mentor in collaboration with the DPC on-site PRA supervisor and the study coordinator. Over a 12-month period, the PRAs received ongoing support from this team to effectively administer the survey. They also became acquainted with: principles of CBR; confidentiality and privacy; organizational culture as an employee of an HIV health care organization; and strategies around personal boundaries when living the dual role of an employee and a peer.

**OUTCOMES & LESSONS LEARNED:** The peer-led survey administration process improved the quality of participant responses, and PRAs were able to develop diverse skills through the PRA-led interview process. Participants gained by being able to talk openly with another peer about their experiences outside of the typical power structures inherent in researcher/subject relationships. This approach also fostered connections between PRAs and a diverse range of stakeholders working in the area of HIV/AIDS, potentially leading to future paid employment and/or volunteer opportunities. This process may be useful to academics and organizations looking to promote the Greater Involvement of People Living with HIV/AIDS (GIPA) in research.

## SS21

### ONE SIZE FITS ALL? EVALUATION OF AN ALTERNATIVE APPROACH TO ENGAGE PEOPLE LIVING WITH HIV WHO USE SUBSTANCES IN HIV COMMUNITY-BASED RESEARCH

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HIV community-based research (CBR) in Canada involves engaging people living with HIV (PLHIV) and affected communities. CBR targeted funding often requires formal engagement, such as community advisory committees (CAC) and "peer research assistants/associates". However, scholarship that evaluates community engagement is lacking, and current models may not be suitable or desirable for all PLHIV, particularly those with complex medical and social needs, those who experience poverty, have psychosocial challenges or use substances. This study compares two models for engaging PLHIV who use substances – a traditional CAC and an activity-based series called "Research Rec(reation)" (RR), a flexible drop-in approach that uses creative and participatory methods to promote inclusion. We used mixed methods to compare approaches with participants who were recruited and self-selected into Research Rec or traditional CAC. Intake interviews and participant evaluation surveys were administered at three sessions to assess motives for joining, level of participation and enjoyment of each session. Data were analyzed from 21 Research Rec and 11 CAC evaluations (from 13 RR and 5 CAC participants). Most participants were male (72.2%), White (77.8%) and rated their health as 'fair' or 'poor' (61.1%). Fewer than 50% of each group were

employed in the past 12 months (23.1% RR, 40% CAC) and many rated their mental health as 'fair' or 'poor' (38.9% RR, 40% CAC). Less than half of the Research Rec participants had advised on research previously, compared to 80% of the CAC participants. Across all three sessions of both groups, most participants rated session productivity as 'good' or 'excellent' (66.7%-100% RR, 75%-100% CAC). Research Rec participants consistently rated their participation level as 'good' or 'excellent' (80-100%) and most (66.7%-100%) rated their enjoyment of each session as 'good' or 'excellent'. Across all three unique activity-based sessions, more than 80% of Research Rec participants said the activity format was 'good' or 'excellent' for discussing the topic. Our preliminary results support the development and implementation of flexible activity-based methods to engage a wider group of PLHIV in CBR.

## SS22

### ETHICS IN COMMUNITY-BASED RESEARCH WITH PEOPLE WHO USE DRUGS: A SCOPING REVIEW AND COMMUNITY RESOURCE

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**BACKGROUND:** Community-based research (CBR) has become a prominent form of HIV/AIDS research across key populations, and there has been a proliferation of guidelines for ethical conduct of CBR. However, few publications address CBR research ethics with people who use drugs. Our aims were (a) to describe the best practices and challenges when conducting CBR with people who use drugs and (b) to produce a print resource for people who use drugs regarding their rights as participants in CBR studies.

**METHODS:** Searching for peer-reviewed and grey literature focused on substance use, CBR, and ethics, we identified 884 English-language articles published from 1985 to 2013. Employing a two-level screening process, 25 references met inclusion criteria and were summarized for main themes relating to ethical issues. Thematic summaries and three group consultations with people who use drugs informed the development of a resource for community members.

**RESULTS:** Five overarching themes were most commonly raised in reviewed publications: participant compensation; the perspectives of people who use drugs on CBR; responsible conduct of CBR; capacity building; and pragmatic issues regarding inclusion within CBR projects. These themes were reflected in the community resource, which aims to both provide basic information about participant rights (e.g., regarding payment, participation while intoxicated, and confidentiality) and to empower potential participants to raise ethical questions with research teams.

**CONCLUSION:** This scoping review and community resource complement recent academic and community-based work focused on the experiences of peer researchers in CBR. Incorporating a scoping review and community consultations, we were able to identify themes in CBR ethics for people who use drugs from multiple perspectives, including those of CBR-experienced and less-experienced community members. We recommend the development of pragmatic ethical guidelines for researchers conducting CBR with diverse communities of people who use drugs.

## SS23

### THE ROLE OF PEOPLE LIVING WITH HIV AS INSTRUCTORS – REDUCING STIGMA AND IMPROVING INTEREST AROUND HIV CARE AMONG MEDICAL STUDENTS

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**BACKGROUND:** People living with HIV (PHAs) are increasingly recognized as experts in their own health and in HIV. In addition, patients are being engaged in medical education to provide experiential learning opportunities for students. Joining these concepts, we developed a Simulated Clinical Encounter (SCE) in which medical students provided pre- and post-test counselling and a point-of-care HIV test for trained PHA-Patient Instructors (PHA-PIs). Our primary objectives were to decrease

HIV-related stigma among medical students and to increase interest and comfort in providing HIV-related medical care.

**METHODS:** 67 second-year medical students were recruited from the University of Toronto to participate in 10 SCEs from September 2012 to March 2013 facilitated by 16 PHA-PIs and 22 Clinical Preceptors. Students completed the Healthcare Provider HIV/AIDS Stigma Scale (HPASS) before and after the SCE. This scale has been previously validated in Canadian trainees. It contains thirty 6-level Likert-scale questions around the themes of stigma, stereotyping, discrimination and prejudice. Higher scores represented higher levels of stigma. An additional 5-level Likert item assessed interest in providing HIV-related care. Results of paired t-tests are presented.

**RESULTS:** 62 of 67 medical students completed paired pre- and post-SCE surveys. Following the SCE, students demonstrated a decrease in overall stigma (68.74 vs. 61.81,  $p<0.0001$ ), stereotyping (27.61 vs. 26.15,  $p=0.0456$ ), discrimination (13.65 vs. 12.37,  $p=0.0007$ ) and prejudice (27.48 vs. 23.29,  $p<0.0001$ ). Participants also reported increased interest (4.01 vs. 4.25,  $p=0.0052$ ) in providing HIV-related care.

**CONCLUSIONS:** Involving PHAs as patient instructors for HIV counselling and testing significantly reduced HIV-related stigma and increased interest in HIV-related care among medical students. Actively engaging PHAs in the delivery of HIV-related medical education can have beneficial outcomes for both learners and PHAs. Additional studies on the potential for improved HIV care are warranted.

## SS24

### THE PATIENT INSTRUCTOR STEERING COMMITTEE – EMPLOYING COMMUNITY-BASED PARTICIPATORY METHODS IN MEDICAL EDUCATION

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**BACKGROUND:** Involving people living with HIV (PHAs) in clinical research has been an essential facet of the response to HIV since the declaration of the Greater Involvement of People with HIV/AIDS (GIPA) Principles in 1994. In undergraduate medical education, PHAs are increasingly being recognized for their HIV expertise grounded in lived experience. We employed community-based participatory research (CBPR) methodology to develop a Simulated Clinical Encounter (SCE) in which medical students provided pre- and post-test counselling and a point-of-care HIV test for trained PHA-Patient Instructors (PHA-PIs). Here, we describe the formation and processes of an innovative Patient Instructor Steering Committee (PISC), formed to guide SCE design, development and implementation.

**METHODS:** The PISC's primary goals were to ensure that the SCE was relevant, acceptable, and effective in reducing stigma and increasing interest in HIV-care among medical trainees, but also relevant, acceptable, and empowering for PHA-PIs. PISC membership drew from research team members, PHAs, standardized patient educators, patient advocates, and medical educators. The PISC met to collectively address PHA-PIs training and support needs, develop recruitment strategies, and clarify SCE logistics and critique and improve our research processes. Decisions were reached through consensus, with quorum defined as two-thirds of PISC members.

**RESULTS:** The PISC evolved from a purely advisory committee to a participatory means of fostering community ownership and empowerment through power sharing, capacity-building, mentoring, and learning exchanges, throughout each phase of the research project. All members of the PISC were involved in co-creating knowledge and teaching one another, with considerable time spent on developing common understandings of the broader determinants of health for PHAs.

**CONCLUSION:** The PISC is a robust model of CBPR methodology for involving PHAs in medical education and HIV research, and can provide useful insights for other educational initiatives involving patient groups.

## SS25

### SUCCESSFUL COMMUNITY HIV STIGMA REDUCTION AND COLLECTIVE EMPOWERMENT: A METHODOLOGICAL ANALYSIS OF CHAMP

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**BACKGROUND:** HIV stigma impedes effective HIV responses. It creates fear that discourages HIV disclosure, testing, and care, resulting in silence and denial. Community Champions HIV Advocates Mobilization Project (CHAMP) is a community-based intervention study undertaken to promote HIV championship among PHAs and non-PHA faith-based, media, and social justice leaders in Toronto's African, Caribbean, Asian, and Latino communities.

**METHODOLOGY:** CHAMP drew on the strengths of mixed methods and health promotion evaluation strategies. It piloted two interventions: Acceptance Commitment Training (ACT) to promote psychological flexibility and Social Justice Capacity Building (SJC) to promote collective empowerment. CHAMP engaged both PHAs and non-PHAs from diverse community sectors. Pre-, Immediate-Post, and 9-month-Post surveys, focus groups, and individual interviews were used to assess the impact of the interventions. Post-intervention monthly activity logs over 9 months and two structured networking sessions were used to document collective empowerment.

**RESULTS:** A total of 31 non-PHA and 35 PHA participated in CHAMP. Results showed significant reduction in internalized and enacted stigma in all intervention groups. Participants reported 1090 HIV championship activities over 9 months post-intervention. This presentation will specifically focus on an analysis of the unique impact of each of the three key design elements in CHAMP: (1) the combination of psychological interventions with collective empowerment strategies to reduce stigma; (2) the promotion of empathy and collaboration among PHA and non-PHA leader across sectors to advance championship; and (3) the embedding of a collective sustainable process to identify next-step strategies to further promote resilience and advance social justice.

**CONCLUSION:** CHAMP has demonstrated the positive impact of community-campus partnership that taps into grassroots knowledge and scientific evidence to address stigma, promote community resilience and advance social change. Expanded partnerships and evaluation of scale-up adaptation of CHAMP interventions in real-life setting are needed to assess sustainable impact.

## Social Sciences: Everyday Actualities of Living with HIV

## Sciences sociales : Vivre avec le VIH au quotidien

## SS26

### A QUALITATIVE ANALYSIS OF FOOD INSECURITY AMONG HIV-HCV CO-INFECTED PERSONS (CTN264) – A SUB-STUDY OF THE CANADIAN CO-INFECTION COHORT (CCC; CTN222)

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**BACKGROUND:** This study aimed to explore the social factors associated with the experience of food insecurity (FI) among those with HIV-HCV co-infection.

**METHODS:** Qualitative interviews were conducted with a convenience sample of 40 food insecure persons of the CCC attending clinics in Vancouver, Toronto, and Windsor in 2014. A mixed-methods approach to coding interviews was applied. Participants' experience of FI (lack of access to food) was examined based on a framework of vulnerability to FI



in which the physical, social, and livelihood aspects of a person's life are organized along three categories of factors (structural, contextual, proximal) that are more or less amenable to modification.

**RESULTS:** Multiple vulnerabilities were associated with participants' FI. From a structural perspective, participants appeared vulnerable by both their physical characteristics (e.g., co-infected and living with addiction) and livelihood (e.g., dependence on supplementary sources of income). Drugs including cannabis (n=25) were a major expense. In addition to disability pensions, wages and odd jobs (n=11) and hustling (selling sex, drugs; n=11) were key contributors to income. Among the contextual factors, availability of food sources (n=37) when money runs out and food buying strategies and preparation skills (n=35) were a concern to participants. The majority of them cared about having good food (n=28). Social factors (n=25) were also closely linked to their experience. For example, being in a relationship was positive for food security (FS) while the street drug environment influenced FS positively (supplementary income to buy food) or negatively (facilitating continued drug use). Proximally, the loss of a partner and effects of new medications could precipitate FI.

**CONCLUSIONS:** The perspective of those who experience FI and co-infection showed that access to food is a complex problem. Measures to improve FS in this population must consider competing financial priorities (e.g., drug use), risky social environments, and health concerns.

## SS27

### TALKING ABOUT SEX IN HIV-AFFECTED FAMILIES

**Fernet, Mylène; Proulx-Boucher, Karène; Blais, Martin; Lapointe, Normand; Otis, Joanne; Samson, Johanne; Racicot, Caroline**  
Montréal, QC

**INTRODUCTION:** Sexual education in families with mothers living with HIV (MLHIV) is often focused on unplanned pregnancy and HIV prevention, with limited discussion of emotional, social and legal issues. This paper aims to examine 1) the prevalence of mother-child communication about sexuality, from the youth perspective and 2) the ease of mothers to talk about sexuality.

**METHOD:** A mixed-method, which combine quantitative and qualitative methods, was used. First, 55 youth (12-28 years; M = 16.2 years) and their mothers (n = 33; 33-49 years; M = 40.9 years) completed a face-to-face questionnaire. A total of 35 youth knew their mother's diagnosis and 11 were infected through vertical transmission. Descriptive analyses and a multivariate regression model (MRM) were performed controlling for gender and age of children, ethno-cultural origin, country of birth, and mothers' religiosity. Eleven mothers also took part in a semi-structured interview.

**RESULTS:** Prevention and contraception are the most common themes discussed. Children who are aware of their mother's diagnosis are more likely to have talked about contraception, condoms and STIs, and consider their mothers as being comfortable, informed and empowered to discuss sexuality. The MRM indicates that knowing the mother's diagnosis plays a significant role only when it comes to talking about STIs. Data analysis indicates that mothers feel responsible to protect their children from STIs and unwanted pregnancies. However, several barriers to sex education are raised by these women like a lack of knowledge about sex.

**CONCLUSIONS:** The results highlight the importance of targeting parental attitudes regarding discussions about sexuality, in respect for cultural values and beliefs. Interventions should consider the HIV status of the child and the willingness of the mother to disclose their HIV status.

## SS30

### AN ENVIRONMENTAL SCAN OF THE ADOPTION AGENCIES THAT SERVE POTENTIAL ADOPTIVE PARENTS WITH HIV

**Underhill, Angela A; Kennedy, V; Lewis, Johanna; Loutfy, Mona**  
Toronto, ON

Reports from the United States indicate that HIV discrimination is a barrier to adoption. This study aimed to address the gap in academic documentation regarding organizational level policies and to identify structural and social facilitators and barriers for people with HIV who are navigating the adoption system. A list of adoption service providers recognized by the Ontario government was compiled using online searches (total of 181, including agencies, practitioners, and licensees). Services

were pre-scanned using available websites, and all were then contacted via telephone to address missing data.

Telephone surveys were completed with 75 adoption service providers and online data collection was possible for an additional 2. Most providers did not have formal policies prohibiting individuals with HIV from adopting (n=68/77). International adoption agencies (n=6/53 total agencies) had the most detailed policies regarding eligibility criteria for prospective parents, ranging from full prohibition of people with HIV adopting to some restrictions apply. Domestic private adoptions were also noted as problematic as health status is disclosed at the request of the birth parents (noted by 7 service providers). Private adoptions (international and domestic) posed significant, if not insurmountable, barriers to adoption for prospective parents with HIV. Some of the domestic adoption service providers (n=17) lacked clarity in terms of admissibility, admitting they were unsure if people with HIV were eligible to adopt. However, a small portion (n=6) of service providers confirmed they were aware of successful adoptions to people with HIV. Incidental findings during the telephone surveys included that some service providers were unaware of the medical advances in the field of HIV and believed that HIV was a terminal illness that hastens death. People with HIV are exploring various ways to become parents. Although less commonly considered, adoption may be a viable option for individuals living with HIV.

## Social Sciences: Gay, Bisexual and other Homosexually Active Men

## Sciences sociales : Guais, bisexuels et autres hommes homosexuels actifs

## SS31

### WHAT'S THE "RISK"? ASSOCIATIONS BETWEEN DEPRESSION, SUBSTANCE USE AND SEXUAL RISK BEHAVIORS AMONG HIV-NEGATIVE GAY, BISEXUAL, AND OTHER MEN WHO HAVE SEX WITH MEN IN TORONTO

**Ablona, Aidan; Noor, Syed; Vernon, Julia; Hart, Trevor**  
Toronto, ON

**BACKGROUND:** Depression has been linked with both substance use and sexual risk behaviours among gay, bisexual, and other men who have sex with men (GBM). However, less is known about how depression affects unprotected anal intercourse (UAI) when conducted in the context of substance use among HIV-negative GBM.

**METHODS:** Using baseline data from the Protective Factors Study (n=470), we examined three separate HIV risk behaviors: number of casual sex partners, UAI with a casual partner, and UAI with HIV-positive or unknown partners in the last 90 days. We fit a zero-inflated negative binomial model for count data and log binomial models for binary outcomes.

**RESULTS:** Most of the sample was younger ( $\leq 35$  years), White, well-educated and Canadian-born. Around 22% reported having UAI with a casual partner and 45% reported depressive symptoms (a score  $\geq 16$  on CES-D). Higher self-reported mean depression scores were associated with any substance use (RR=1.26, 95% CI:1.05-1.51) and substance use before or during sex (RR=1.42, 95% CI:1.17-1.70) in the last 90 days, but not with alcohol use. In addition, when substance use measures were controlled, depression was associated with UAI with a casual partner (RR=1.39, 95% CI:1.07-1.83) and UAI with a casual partner whose HIV status was HIV-positive or unknown (RR=1.68, 95% CI:1.28-2.22). Depression was not associated with more sexual partners in multivariable analyses.

**CONCLUSION:** In this sample of HIV-negative GBM, depression and substance use were associated with UAI with casual partners, including partners who were HIV-positive. Though temporality between depression and substance use and reasons for substance use during sex are unknown, there was high substance use in sexual contexts and engagement in risky sexual behaviors by GBM with depressive symptoms. HIV prevention interventions for HIV-negative GBM should also consider syndemic psychosocial problems that may increase risk of HIV contraction in this key population.

## SS32

**CONFLICTING AND CONFLICTED: HOW GAY MEN IN CANADA ARE MAKING SENSE OF AND APPLYING NEW BIOMEDICAL KNOWLEDGE OF HIV RISK, TRANSMISSION AND PREVENTION**Adam, Barry<sup>1,2</sup>; Jackson, Ed<sup>1</sup>; Patten, San<sup>3</sup>; LeBlanc, Marc-Andre<sup>4</sup>; Girard, Gabriel<sup>5</sup><sup>1</sup>Toronto; <sup>2</sup>Windsor, ON; <sup>3</sup>Halifax, NS; <sup>4</sup>Gatineau; <sup>5</sup>Montreal, QC

**BACKGROUND:** Biomedical knowledge of HIV transmission, risk, and prevention has greatly evolved over the last 10 years. *The Resonance Project: Emerging Biomedical Discourses and Decisions within Gay Men's Knowledge Networks* is a collaboration between 4 Canadian HIV NGOs, 3 gay men's health organizations and the University of Windsor, with the objectives to critically examine: if/how gay men are taking up biomedical knowledge of HIV; if/how biomedical knowledge of HIV has resonance for their everyday lives; the discourses used to make sense of risk, and inform sexual decision-making and practices; and, the roles and responsibilities of institutions and service providers in shaping these discourses.

**METHODS:** We conducted focus groups and interviews in Vancouver, Toronto and Montreal with 4 subgroups of gay men (n=87), including those: connected to the HIV sector; in serodiscordant relationships; sexually active and HIV-positive; and, HIV-negative and 'at risk'. We used mock online dating/hook-up profiles and scenarios, and real media headlines to elicit their reactions and understandings. Using an interpretive description approach, we conducted thematic analysis of the data, supplemented by field and debrief notes, and a quantitative intake survey.

**RESULTS:** The biomedical concepts discussed in the focus groups (e.g., undetectable viral load, PrEP, condoms, seroadaptive behaviours) resonated differently among gay men, ranging from enthusiastic uptake (e.g., "undetectable is the new negative"), misconstrued or partial integration (e.g., "you can't get it if you only top"), to resistance and suspicion of any prevention messages/strategies other than condom use (e.g., "Truvada whores" and "condoms are non negotiable").

**CONCLUSIONS:** The Resonance Project has uncovered diverse ways in which gay men in Canada – individually and as communities – are making sense of, incorporating into their understanding, and modifying their behaviours based on the new biomedical knowledge of HIV. The next phase of the Project will identify the main messages, precautions and caveats which must be incorporated into communication about biomedical knowledge of HIV to be sensitive to the lived realities of gay men.

## SS33

**ASSOCIATIONS BETWEEN MOTIVATIONS, ONLINE PARTNER-SEEKING TECHNOLOGIES AND HIV RISK BEHAVIOURS AMONG YOUNG MEN WHO HAVE SEX WITH MEN**Claybo, Dominique; Allman, Dan  
Toronto, ON

**BACKGROUND:** In Canada, young men who have sex with men (YMSM) are an under-researched population. They are also early adopters of new media technologies, including websites and GPS-based applications for seeking sexual partners. This research explores the motivations, experiences, and HIV risk behaviours of YMSM seeking sexual partners with these new technologies.

**METHODS:** This is a descriptive cross-sectional study using data collected from self-completed questionnaires and one-on-one interviews. Self-identified YMSM participants between the ages of 16-28 were recruited from the area surrounding one of Canada's largest universities. Ethical review was obtained. Interviews were audio-recorded and transcribed. Data analysis focuses on qualitative themes and quantitative associations.

**RESULTS:** While data collection is ongoing, this unique study of YMSM explores 1) the motivations participants have when using partner-seeking websites and applications; 2) the experiences and attitudes towards misrepresentation, both self-reported and perceived; and 3) the reported risk behaviours that occur during exchanges with partners met online compared to partners met offline. Results describe the interplay between motivation, HIV vulnerability and resilience, and online partner-seeking technologies among YMSM.

**CONCLUSION:** New web- and GPS-based partner-seeking technologies may facilitate a greater number of sexual partners, often between men

who might not have otherwise encountered each other. Yet, the literature suggests that men's motivations, behaviours, and interactions, rather than the technologies themselves, are more accurate indicators of the relationship between HIV risk and the online partner-seeking technologies. Understanding YMSM's motivations in tandem with their experiences with these technologies informs key actors working within HIV prevention and influences the development of HIV prevention programs specifically targeted to YMSM.

## SS34

**TALK SEX WITH A NURSE**Fenik, Jillian<sup>1</sup>; Lee, Colin<sup>1,2</sup><sup>1</sup>Barrie; <sup>2</sup>Toronto, ON

The Simcoe Muskoka District Health Unit (SMDHU) uses social media to reach the hidden and hard to reach population of men having sex with men (MSM). The SMDHU INFOurseX profile went live on www.squirt.org in May 2012. A public health nurse is available online for a total of five hours per week; Monday to Friday from 2:30pm to 3:30pm, to engage users in sexual health discussions and respond to questions. Users can interact with the PHN via instant messaging/email or the message board. Message boards are also used to communicate clinics offered by the health unit such as the Men only Drop-In clinic and the Anonymous Rapid HIV Drop-In clinic.

A large percentage of MSM in Simcoe Muskoka are still not out publicly regarding their sexual orientation or practices and having a nurse online provides a discreet way for MSM to access information from a credible source. Our goal is to raise awareness among MSM about risk factors for STIs, the signs and symptoms of sexually transmitted infections, the importance of testing, and to encourage safer sex practices.

E-blast messages are another tool used to engage the online population. Approximately 2000 men receive our messages in Simcoe Muskoka and on average 300-400 people open and read our eblast message.

This is a new outreach environment for public health and we have seen a steady increase in the number of MSM accessing our clinic services since May 2012. This unique initiative provides an on-going, discreet opportunity for men to ask questions and receive information in a confidential online environment.

In 2014, SMDHU received the Judges Award for Innovation as part of Canada Health Infoway's Public Health Social Media Challenge for this initiative.

## SS35

**BLOOMING LOTUSES: USING COMMUNITY-BASED RESEARCH TO UNEARTH RESILIENCE AMONG EAST/SOUTHEAST ASIAN GAY/BI MEN LIVING WITH HIV IN TORONTO**Hui, Christian<sup>1</sup>; Utama, Richard<sup>1</sup>; Poon, Maurice<sup>1</sup>; Chen, YY<sup>1</sup>; Sutthibhasilp, Noulmook<sup>1</sup>; Wong, Josephine<sup>1</sup>; Cabarios, Constantine<sup>1</sup>; Murray, James<sup>1</sup>; Adam, Barry<sup>1,2</sup>; Li, Alan<sup>1</sup><sup>1</sup>Toronto, ON; <sup>2</sup>Windsor, ON

**BACKGROUND:** Asian gay/bi men often face multiple forms of discrimination including racism, homophobia, and xenophobia. Those living with HIV face additional stigma and social exclusion. Existing research on related issues seldom adopts a strength-based approach. To bridge this knowledge gap, Asian Community AIDS Services undertook the Asian MSM Pathways to Resiliency (AMP2R) study to identify facilitating conditions and resilience strategies that helped Asian MSM address their life challenges.

**METHODS:** Employing a community-based research methodology, a partnership of Asian gay/bi men, PHAs, service providers, policy-maker and researchers made up the investigative team. Six focus groups were conducted, including five groups of Asian gay/bi men (N=51) plus one group of service providers (N=13). One of the focus groups was PHA-specific and attended by 12 participants. Average age of PHA participants was 45 (range 29-60), and 8 were first generation immigrants who had been in Canada for an average of 20.6 years. Participants discussed their major life challenges, and their strategies for addressing them. Transcribed data were thematically coded and preliminary findings were presented back to participants to engage them to co-develop recommendations.

**RESULTS:** Participants identified key challenges with: managing health complications relating to long-term medication side effects and aging;

social isolation relating to multiple losses; and, sexual exclusion due to criminalization of HIV non-disclosure. Positive moderators include access to culturally-appropriate services, supportive social network, intimate relationships, and stable income. Key resilience strategies include prioritizing and practicing self-care; drawing strengths from past challenges; overcoming self-blame for contracting HIV; accessing cultural strengths; and engaging in capacity building.

**CONCLUSIONS:** The study generates fresh insights into facilitating factors and resilience responses that help HIV-positive Asian gay/bi men overcome complex life challenges. Intervention seeking to promote their resilience should focus on helping them access cultural strength, engage in cross-generational mentorship, and apply resilience strategies across life challenges.

### SS36

#### **"COMMUNICATING THE COMPLEXITIES": HOW SERVICE PROVIDERS ARE MEETING THE CHALLENGE OF INTEGRATING BIOMEDICAL KNOWLEDGE OF HIV INTO THEIR PREVENTION EFFORTS WITH GAY MEN**

**Jackson, Ed<sup>1</sup>; Adam, Barry<sup>1</sup>; Patten, San<sup>2</sup>; LeBlanc, Marc-Andre<sup>3</sup>; Girard, Gabriel<sup>4</sup>**

<sup>1</sup>Toronto, ON; <sup>2</sup>Halifax, NS; <sup>3</sup>Gatineau; <sup>4</sup>Montreal, QC

**BACKGROUND:** Biomedical knowledge of HIV transmission, risk, and prevention has greatly evolved over the last 10 years. *The Resonance Project: Emerging Biomedical Discourses and Decisions within Gay Men's Knowledge Networks* is a collaboration between 4 Canadian HIV NGOs, 3 gay men's health organizations and the University of Windsor, with the objectives to critically examine: if/how gay men are taking up biomedical knowledge of HIV; if/how biomedical knowledge of HIV has resonance for their everyday lives; the discourses used to make sense of risk, and inform sexual decision-making and practices; and, the roles and responsibilities of institutions and service providers in shaping these discourses.

**METHODS:** We conducted focus groups and interviews in Vancouver, Toronto and Montreal with 30 service providers who provide sexual health, counseling and HIV prevention services to gay men. Using an interpretive description approach, we conducted thematic analysis of the data, supplemented by field and debrief notes, and a quantitative intake survey.

**RESULTS:** Service providers face complex challenges in providing HIV prevention information, advice and counseling to their gay men clients/patients. They must handle: basic knowledge levels of HIV among some gay men; prevention in the context of the coming out process; difficult questions; feeling the need to err on the side of caution in prevention messages; diverse needs within ethnocultural communities; the complexity of research translation; silences around HIV in the community; the variety of physical and virtual spaces within which gay men connect; and lack of consensus within organizations and among service providers of the level of biomedical complexity that is appropriate.

**CONCLUSIONS:** The Resonance Project has uncovered the major challenges experienced by service providers and the key strategies they use to communicate biomedical aspects of HIV risk, transmission and prevention. Next steps for the Resonance Project are to develop KTE tools and messages that incorporate main messages, precautions and caveats that are sensitive to the lived realities of gay and bisexual men.

### SS37

#### **HIV SELF-TESTING FOR MSM: ACCEPTABILITY AMONG COMMUNITY MEMBERS AND SERVICE PROVIDERS IN VANCOUVER, TORONTO, AND MONTREAL**

**Haig, Thomas A<sup>1</sup>; Otis, Joanne<sup>1,2</sup>; Veillette-Bourbeau, Ludivine<sup>1</sup>; Caruso, Jessica<sup>1</sup>; Jolimore, Jody<sup>2</sup>; Ferlatte, Olivier<sup>2</sup>; Maxwell, John<sup>3</sup>; Rousseau, Robert<sup>1</sup>**

<sup>1</sup>Montreal, QC; <sup>2</sup>Vancouver, BC; <sup>3</sup>Toronto, ON

**BACKGROUND:** Although not currently approved in Canada, HIV self-testing could facilitate better access to testing, in particular for MSM who test frequently or experience barriers to testing. The acceptability of different types of self-tests (oral vs. fingerstick) and approaches to making self-testing available (supervised, community-based vs. unsupervised, over-the-counter) needs to be assessed.

**OBJECTIVE:** Evaluate the acceptability of HIV self-testing (in terms of various factors including beliefs, preferences, concerns, facilitators / barriers to access) among MSM and service providers in Vancouver, Toronto, and Montreal.

**METHOD:** In October and November 2014, focus groups were held in each city for community members who identify as MSM (n=16) and service providers (n=20). Participants also completed a questionnaire. Descriptive analyses of means and proportions were generated. Transcripts of the focus groups discussions were analyzed thematically.

**RESULTS:** Qualitative analysis showed that key concerns include accuracy of test result, cost, confidentiality, and ease of access. Among community members, 87.5% would be willing to use a self-test at home. All service providers (100%) were in favour of making self-testing available to MSM in Canada. A majority of both community members and service providers preferred the fingerstick self-test, respectively 68.8% and 60%. Half of community members and one third of service providers preferred a supervised, community-based approach to making self-testing available and learning how to use the test, compared to unsupervised, over-the-counter purchase in a pharmacy. However, a proportion of community members (18.9%) and service providers (25%) preferred a mixed approach.

**CONCLUSION:** HIV self-testing appears to be highly acceptable and could increase testing rates among MSM. A fingerstick test may be the best choice for introducing self-testing in Canada. These findings highlight the need to provide MSM with various options for accessing and learning how to do HIV self-testing, adapted to a range of personal profiles and contexts.

### SS38

#### **FROM ACUTE PALLIATION TO CHRONIC CARE: USING THE NARRATIVES OF TWO GAY CARE-GIVERS TO EXPLORE EXPERIENCES OF PROVIDING HIV SUPPORT ACROSS SOCIOHISTORICAL CONTEXTS**

**Kia, Hossein**

**Toronto, ON**

Despite the longstanding shift in conceptualizing HIV/AIDS as a site of chronic care, versus one of acute palliation (Seigel & Lekas, 2002), few attempts have been made to examine care-giving in the context of this change. The poster presented at this conference outlines a paper aimed at exploring the evolving nature of HIV/AIDS care-giving among sexual minorities. This paper, whose empirical analysis was based on a study originally designed to examine the care-giving experiences of gay men more broadly, compared the narratives of two partnered care-givers of HIV-positive gay men whose stories were located in disparate sociohistorical contexts. Whereas one care-giver provided support during an era in which HIV/AIDS was primarily conceptualized as acutely life-limiting, the other did so in the contemporary period of chronic HIV care. Although similarities were noted across the stories, distinctions were also apparent in how the care-givers encountered expressions of homophobia and HIV stigma, and negotiated these realities distinctly as functions of sociohistorical context. In particular, despite the salience of these systemic barriers across the two narratives, experiences with homophobia and HIV stigma appeared to occur more routinely and indefinitely in the context of chronic care. The poster lists implications of the presented paper's analysis on theory, research, policy and practice, including importantly the need for programs that address and mitigate homophobia and HIV stigma across a range of professional contexts associated with the provision of practical and emotional support to carers of those living chronically with HIV.

Reference: Siegel K, Lekas H. AIDS as a chronic illness: Psychosocial implications. *AIDS* 2002;16(4):S69-S76.



## SS40

**WHAT DOES HIV RISK MEAN TO RURAL-SUBURBAN GAY MEN? QUALITATIVE FINDINGS FROM THE HEALTH IN MIDDLESEX MEN MATTERS (HIMMM) PROJECT**

**Pugh, Daniel<sup>1</sup>; Bauer, Greta R<sup>2</sup>; Coleman, Todd A<sup>1,2</sup>; Aykroyd, Gloria<sup>2</sup>; Fraser, Meredith<sup>2</sup>; Powell, Leanne<sup>2</sup>; McIntosh, Martin<sup>2</sup>; Newman, Rob<sup>2</sup>; Giblon, Rachel<sup>2</sup>**

<sup>1</sup>Toronto; <sup>2</sup>London, ON

**BACKGROUND:** The HiMMM Project is a community-based study of factors identified within the LGBT2SQ community of London-Middlesex, Ontario and their impact on HIV-related risk, HIV testing, and health services access. Canadian information on the health of gay, bisexual and other men who have sex with men (GB-MSM) and information on HIV are lacking outside of major metropolitan areas.

**METHODS:** Over a six month period, 20 individual, in-depth interviews were completed with participants between the ages of 17 and 76. Using Nvivo 10 software, the data collected from these interviews were coded based on identified research themes (communication, homophobia, and isolation/social exclusion). Additional themes were identified by the team from the data. One of the predominant themes was 'risk' and how it impacted participants' understanding of sexual health.

**RESULTS:** In general, participants felt that sex was an important component of their overall health, linked to mental and emotional health. Participants' understandings of 'risk' and risk reduction strategies generally reflected the strong adoption of traditional messages about HIV prevention. Condom use and monogamous relationships were identified as risk reduction strategies for HIV. Participants frequently defined 'risk' in relation to sex and HIV transmission. Risk activity was identified as: multiple partners, physical abuse, condomless sex, and substance use. Participants associated specific spaces with these practices, including bathhouses and clubs. Often, participants reported the frequency of their HIV testing was related to their perceived level of risk.

**DISCUSSION:** Findings from this study highlight that participants engage with traditional HIV prevention strategies. However, the field of HIV prevention continues to evolve to include new prevention strategies and technologies that were not observed in this sample. Further data analysis will explore whether risk assessment differs according to select age cohorts. These results will be helpful in building targeted HIV prevention and testing efforts in London, Ontario.

## SS41

**MAKING SENSE OF THE INCLUSION OF TRANSGENDER MEN AND THEIR HIV RISK PROFILE WITHIN A BIO-BEHAVIOURAL POPULATION STUDY OF GAY AND OTHER MEN WHO HAVE SEX WITH MEN (MSM) IN VANCOUVER, BRITISH COLUMBIA**

**Rich, Ashleigh<sup>1</sup>; Lachowsky, Nathan J<sup>1</sup>; Blackwell, Everett D<sup>1</sup>; Scott, Kai<sup>1</sup>; Johnston, Caitlin<sup>1,2</sup>; Zhang, Wendy<sup>1</sup>; Sereda, Paul<sup>1</sup>; Moore, David M<sup>1</sup>; Hogg, Robert S<sup>1,2</sup>; Roth, Eric A<sup>3</sup>**

<sup>1</sup>Vancouver; <sup>2</sup>Burnaby; <sup>3</sup>Victoria, BC

**BACKGROUND:** We conducted a mixed-method analysis to explore HIV risk for transgender men in the Momentum Health Study, a bio-behavioural study of gay and other MSM.

**METHODS:** We conducted bivariate analysis comparing trans-MSM (TMSM) with cisgender participants and performed semi-structured qualitative interviews with 11 of these participants. Interview transcripts were catalogued in the qualitative analysis software NVIVO and systematically reviewed to identify emergent themes within the data; individual accounts were grouped into discrete categories describing common themes of experience.

**RESULTS:** Of the 14 gay or queer transgender-identified men that met Momentum eligibility criterion "male-identified", median age was 26 years [IQR:24-28], 86% identified as White and all were HIV uninfected. In bivariate analyses, compared with cisgender peers, TMSM engaged in fewer HIV sexual risk behaviours (e.g. anal sex) and greater use of some HIV risk reduction strategies (e.g. consistent condom use). Qualitatively, participants described engaging in a range of sexual activities, with transgender and cisgender partners. While some participants described participation in largely cisgender gay men's communities, others perceived exclusion and lack of access to health education and services for gay

men. Substance use, specifically alcohol, was presented as a facilitator of sex and dating. The ability to control trans-status disclosure encouraged seeking sexual partners online. Though less familiar with other forms of anti-retroviral therapy based HIV prevention, participants were largely familiar with PEP and several had considered using or used PEP.

**CONCLUSION:** While interview accounts uncovered the multi-faceted potential vulnerability of evolution for these TMSM into a socio-sexual arena with unique sexual health needs and risks, both qualitative and quantitative results framed HIV risk for these TMSM as low, consistent with participant perceptions. These findings inform trans-inclusive MSM research and highlight the need for tailored health services for TMSM not reached by existing gay men's health promotion.

## Social Sciences: Organizational Strategies in the Context of Policy and Funding Shifts

### Sciences sociales : Stratégies organisationnelles dans le contexte des changements dans la politique et le financement

## SS42

**DEVELOPING AN EDUCATION AND TRAINING MODULE FOR THE ONTARIO ASSOCIATION OF CHILD AND FAMILY SERVICE WORKERS: LESSONS LEARNED FROM THE POSITIVE PARENTING PILOT PROJECT**

**Greene, Saara<sup>1</sup>; O'Brien Teengs, Doris<sup>2</sup>; Dumbrill, Gary<sup>1</sup>; Ion, Allyson<sup>1</sup>; Shindler, Simone<sup>3</sup>; Porter, Megan<sup>3</sup>; Beaver, Kerrigan<sup>1</sup>**

<sup>1</sup>Hamilton; <sup>2</sup>Thunder Bay; <sup>3</sup>Toronto, ON

**INTRODUCTION:** Research suggests that there is a dearth of updated HIV education and training materials and opportunities for social workers and students, particularly within the field of child welfare. This is important given that parents living with HIV perceive their relationships with child and family service workers (CAS) to be underpinned by HIV-related stigma and a lack of knowledge and understanding of the clinical, social and legal aspects of living with HIV. Drawing on findings from the Positive Parenting Pilot Project, this paper will present the HIV education and training needs of CAS workers and social work students in Ontario.

**METHODS:** Focus groups were conducted with social workers from three Ontario Child and Family Services agencies (N=19) and students enrolled in child welfare and case management courses from three social work/social service worker programs in Ontario (N=44). Focus group questions explored HIV related knowledge and attitudes, and critical areas of training and skill development for supporting families affected by HIV.

**FINDINGS:** CAS workers and students require training on HIV transmission, prevention and treatment; HIV related stigma and social and emotional health; and the criminalization of HIV and its impact on individuals and families. CAS workers expressed their need for agency based policies and resources that will guide their practice with parents living with HIV, while students view HIV education as an integral component of their social work training.

**CONCLUSIONS:** Providing HIV education and training for CAS workers and social work students has the potential to result in developing appropriate policies, practices and strategies for supporting parents living with HIV. These components must be viewed as an integral aspect of the Ontario Association of Child and Family Service commitment to anti-oppressive education and integrated into existing policies and compulsory professional development modules that social workers and social work students currently access.

# SS43

## THE ROLE OF THE NURSE PRACTITIONER IN AN INTEGRATED HIV/AIDS HEALTH CARE SETTING AT THE DR PETER CENTRE

MacHattie, Alana<sup>1</sup>; Payne, H Martin<sup>2</sup>; McDougall, Patrick<sup>2</sup>; Baltzer Turje, Rosalind<sup>2</sup>

<sup>1</sup>N/A; <sup>2</sup>Vancouver, BC

The Dr. Peter Centre (DPC) is an HIV health care facility that provides support to some of Vancouver's most vulnerable citizens who face poverty, homelessness, and mental health and addiction issues, in addition to HIV/AIDS. DPC services are designed to engage individuals in their health care with a specific goal of improved adherence to HIV treatment and overall improved health care. In 2008, the DPC introduced a nurse practitioner (NP) role to its programs, creating a unique care context in which the role of the NP has rarely been documented.

In 2013, following a scoping review, an MPH student developed a case study on the role of the NP at the DPC and identified six broad role elements of the NP in relation to harm reduction services (facilitation of access to services, case management, clinical services, patient education and support, support for multidisciplinary teams, and use of evidence-based practice). The six role elements complement each other effectively to form a complex and integrated approach to NP care, allowing the NP to address many significant barriers to care for DPC clients.

As care providers face evolving roles and contexts for prevention, treatment, and care of individuals with substance use disorders and comorbid complex illnesses, the NP role offers a promising contribution to future HIV/AIDS management. Particularly in the stable and chronic phases of illness, the NP role enables the delivery of effective, efficient, and consistently engaged care. Optimizing the use of the NP role is fundamental to creating sustainable solutions and increasing access to care for high-need priority populations in Canada.

While empirical evidence points to the positive impacts of integrating the NP role at the DPC, there is a need to identify end point goals through a robust evaluation to demonstrate the impacts that the NP's role facilitates for clients.

# SS44

## LIVING WITH HIV: WOMEN'S ACCESS TO HEALTH AND SOCIAL SERVICES IN THE MARITIME PROVINCES, CANADA

Medeiros, Priscilla

Hamilton, ON

AIDS Service Organizations (ASOs) play an important role in providing services to people living with HIV worldwide. Changes to the HIV service paradigm in Canada, such as the broadening mandate to address sexually transmitted and blood-borne infections and the shift towards service integration, will affect people living with HIV. These changes are significant and may end essential disease-specific programming that people living with HIV regularly access, including transportation support or support groups. My research uses qualitative data from semi-structured interviews with women living with HIV to document their experiences accessing health and social services in the Maritime Provinces. This study is part of a larger project that will conclude in 2015.

In total 71,300 people are living currently live with HIV in Canada; Atlantic Provinces account for the lowest HIV prevalence rate (2%). As a result of this low incidence, especially among women, provincial ASOs receive governmental funding that is only sufficient in covering management and administration expenses. Fundraising campaigns are necessary to fund priorities not covered by the government. My research uses grounded theory-based methodology to interpret the interviews of women living with HIV to assess the landscape of services women are accessing in their communities for maintaining their well-being. Preliminary results indicate a need for women HIV-centered care focusing on issues of reproduction, childcare, and food security. More effective service delivery strategies, such as online networks and the availability of mobile health clinic outreach, may help to meet the needs of women living with HIV. This paper aims to increase knowledge about health and social service usage among women living with HIV, the role ASOs currently play in their lives, and concludes with women's views on the future direction of service delivery for ASOs in Canada.

# SS45

## BUILDING CAPACITY FOR REHABILITATIVE CARE: AN EVALUATION OF THE USE OF OCCUPATIONAL THERAPY STUDENT PRACTICUMS IN CANADA'S COMMUNITY-BASED HIV ORGANIZATIONS

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Reliable access to combined antiretroviral therapy has turned HIV into a chronic, episodic illness for many in Canada. Since 1998, The Canadian Working Group on HIV and Rehabilitation (CWGHR) has been promoting access to rehabilitation services for people living with HIV (PLWHIV) to ensure that their quality of life is also sustained. CWGHR's work has become increasingly challenging, and vital, in an environment of funding cutbacks which have limited access to rehabilitation services outside inpatient settings. This presentation will introduce a novel initiative which successfully situated occupational therapy (OT) practicum students in community-based HIV organizations (CBHOs) and highlight some of the lessons learned during the project pilot.

The objectives of this program are: 1) to increase access to OT by PLWHIV who access CBHOs; and 2) to familiarize OT students with the role of OT in the care of PLWHIV. During the pilot, nine students from three Canadian universities completed practicums in six CBHOs. Their activities included: resource and program development; program implementation; raising awareness about the role of OT, and clinical support for PLWHIV. These placements were considered "role-emerging" by the universities as students were placed in environments which did not have Occupational Therapists (OTs) on staff nor established roles for OTs.

During the pilot, project stakeholders (CWGHR staff, academic fieldwork coordinators, OT clinical supervisors, CBHO staff and students) engaged in ongoing dialogue and debriefing to clarify their roles in this cross-sectoral approach to training and service provision. When the pilot practicum placements were complete, an online survey conducted with students and their CBHO supervisors showed that working together had increased knowledge and capacity to deliver care for PLWHIV among both groups. This project exemplifies how a catalyst organization can foster intersectoral partnership-building between organizations and institutions with seemingly different goals and mandates, to their mutual benefit.

# SS46

## RURAL AND REMOTE NEEDS ASSESSMENT

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Ottawa, ON

In 2013 the Canadian AIDS Society undertook a needs assessment of community-based organizations serving communities that are rural and remote in nature. Approximately 20% of Canadians live in rural and remote communities. While HIV is often perceived as a urban issue, there is an increasing amount of qualitative and anecdotal evidence that demonstrates that HIV strongly affects rural and remote populations in Canada. An advisory committee developed a series of questions to capture a glimpse of the realities of service provision in these communities and launched a national survey in the fall of 2013. In total we received 28 completed responses. Fluid Survey was used to disseminate the findings and conduct the analysis.

The findings of this survey are divided into the following categories: Characteristics of organizations. What makes Rural and Remote Communities Unique? Services and Gaps. Organizational needs. Barriers and Challenges. Stigma and Discrimination. Unmet needs. Partnerships. Funding. Two of the biggest challenges raised in this research are the impacts of transportation and of stigma and discrimination. Challenges related to transportation include the impact that having access to transport has on the daily life of a person living with or at risk for HIV, while stigma is cited as a problem that impacts confidentiality, housing, employment and access to services and programs.

A series of recommendations follow from the findings of this survey. These recommendations include the need for targeted anti-stigma campaigns, the need for peer-based programs, flexibility in funding, particularly when it comes to transportation (of clients as well as staff supports) and improved services for people who use drugs.

## SS47

**EXCEPTIONAL NARRATIVES OF RESISTANCE: (RE) TELLING THE HISTORY OF THE HIV/AIDS MOVEMENT**

**Wilson, Ciann; Flicker, Sarah; Restoule, Jean-Paul**  
**Toronto, ON**

Over thirty years after the dawn of the HIV epidemic, arguments against the need for an exceptional response to HIV have gained popularity. Once widely regarded as a “death sentence,” bio-medical advances and great strides in the visibility and voices of people infected and affected by HIV have since made HIV a chronic disease in specific contexts and for specific populations. Proponents for arguments against HIV exceptionalism ignore the fact that HIV is a harbinger of social inequality and continues to disproportionately impact many marginalized communities around the world who do not have the political power and money needed to keep the issue a high priority on the public agenda. This oversight is also informed by a narrow recount of the history of the epidemic and the HIV movement, which is often thought to be historically and politically located in and synonymous with the White, gay men’s liberation movement in the west. However, this problematic meta-narrative that links advances in HIV to a singular victory for one community wrecks of the operations of power and invisibility of identities at the intersections of race, gender, sexual orientation, class, ability, geography and so on. It contributes to the erasure of less popularized acts of resistance from Indigenous communities, women and communities of colour around the world, deeming them agentless victims and passive recipients of HIV advances. This paper argues that locating the HIV movement in the struggles for Black liberation, Indigenous sovereignty, feminism and LGBT rights helps to legitimate the histories, narratives and make space for the voices of marginalized communities; legitimates the relevance of an exceptional response to HIV, which continues to have a devastating impact on disenfranchised communities; and sheds light on the fact that HIV thrives in environments prone to human rights violations and inequality along intersectional identities.

## SS48

**SURVEY OF HEALTHCARE PROFESSIONALS ON THE ROLE OF PHARMACISTS IN AN OUTPATIENT HIV CLINIC SETTING**

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 Martel, Dominic<sup>1</sup>; Toy, Junine<sup>4</sup>; Sulz, Linda<sup>5</sup>; Sheehan, Nancy<sup>1</sup>;  
 Lemire, Benoît<sup>1</sup>; Foisy, Michelle<sup>6</sup>**  
<sup>1</sup>Montreal, QC; <sup>2</sup>Ottawa; <sup>3</sup>Windsor, ON; <sup>4</sup>Vancouver, BC;  
<sup>5</sup>Regina, SK; <sup>6</sup>Edmonton, AB

**BACKGROUND:** Pharmacists play a variety of roles in the interdisciplinary care of HIV-infected patients. The objective of this study was to describe how HIV healthcare professionals perceive the relative importance of pharmacist activities and compare pharmacists’ perception to the other disciplines.

**METHODS:** A descriptive cross-sectional survey was developed and sent to Canadian HIV practitioners involved in interdisciplinary teams, including pharmacists, physicians, nurses, etc. Data was collected anonymously in Fluid Survey™, a secure online survey tool, using a snowball sampling technique.

**RESULTS:** Of the estimated 335 emails requesting participation, 95 participants completed the survey (response rate of 28%). Of the 53 criteria, 19 (36%) were characterized as “very important” by more than 50% of respondents. There was a high level of agreement between pharmacists, physicians and nurses on the top 5 most important pharmacist activities requiring patient referral: evaluation of patients on complex treatments, counselling for initiation in ARV therapy, assessment of drug interactions, counselling for change in ARV therapy and patient assessment for recommendations to change ARV therapy; the latter was considered less important by physicians (ranked 8th), whereas assistance in securing drug coverage was rated higher (ranked 3rd). When examining important patient characteristics, both pharmacists and nurses ranked compromised organ function, peri-organ transplant, malignancies requiring therapy and pregnancy as highest priority; pharmacists also identified paediatrics (ranked 1st) whereas nurses added the presence of multiple co-morbidities (ranked 4th). Physicians rated paediatrics, pregnancy, no legal status in Canada, refugee status and hospitalization as the 5 most important criteria.

**CONCLUSION:** A large variety of pharmacist activities were considered “very important” by the majority of participants. The different per-

ceptions of the role of a pharmacist in the care of HIV patients warrants the development of a short, simple screening or referral tool to identify patients most likely to benefit from a pharmacist consult.

**Social Sciences: Sex, Sexuality and Gender:  
 Populations across Diverse Contexts and  
 Axes of Inequity**

**Sciences sociales : Sexe, sexualité et genre :  
 Populations dans les contextes et axes  
 divers d’inégalité**

## SS49

**EXPOSURE TO INTERPERSONAL VICTIMIZATION AND SEXUAL RISK PROFILES OF MALE ADOLESCENTS AGED 14 TO 22 YEARS-OLD IN THE PROVINCE OF QUEBEC (CANADA)**

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<sup>1</sup>Montréal; <sup>2</sup>Quebec, QC

**OBJECTIVES:** The objectives were to identify sexual risk profiles of male adolescents aged 14 to 22 years-old in the province of Quebec and to explore correlates of profile membership in terms of interpersonal victimization.

**METHOD:** Participants were 3461 male adolescents aged 14 to 22 years-old, living in the province of Quebec and interviewed in school settings as part of the first wave of the Youths’ Romantic Relationships Survey. We used a person-centered approach to model sexual risk taking indicators (age at first sex, number of sexual partners, systematic condom use for anal or vaginal sex, non-relational sex, transactional sex, and events of pregnancy among partners) and compared profile membership according to exposure to various forms of interpersonal violence.

**RESULTS:** Four profiles were identified: Abstinent (64%), Normative debut-few sexual partners (15%), Early debut-Multiple partners (13%), and High risk (8%). The High risk profile showed the highest number of sexual partners combined with non-systematic condom use (59%), non-relational sex (33%), transactional sex (16%), and events of pregnancy among partners (9%). The High risk profile also involved the highest proportion of non-exclusively heterosexual participants. Membership in profiles with greater at-risk sexual behaviors was associated with a history childhood sexual abuse and dating victimization experiences (emotional, sexual and threats). Experience of physical dating violence, childhood physical abuse in the family or witnessing interparental violence failed to distinguish profiles.

**CONCLUSION:** The results show correlational evidence supporting a relationship between interpersonal violence and sexual risk-taking in male adolescents. STIs and HIV prevention programs should not assume a homogeneous population with respect to sexual risk taking among male youths. The psychosocial sequelae of interpersonal victimization among adolescent male need to be efficiently addressed to decrease their engagement in at-risk sexual behaviors. Potential mediators such as posttraumatic stress symptoms, substance use and sense of hopelessness need to be explored in future investigations.

## SS50

**STORYTELLING FOR SEXUAL HEALTH: A CULTURALLY RELEVANT MODEL TO BUILD HIV KNOWLEDGE AND CAPACITY AMONG SOUTH ASIAN WOMEN**

**Chikermane, Vijaya; Wong, Josephine; Hawa, Roula; Chambers, Lori; Vahabi, Mandana; Hari, Shriya**  
**Toronto, ON**

**BACKGROUND:** ASAAP is leading a Community-Based Research study to explore the effectiveness of storytelling as a culturally relevant and gender based model of HIV prevention and support among South Asian women. Funded by the Women’s College Hospital Research Institute, the study uses a mixed methods approach to assess storytelling tools and approaches developed and used in ASAAP’s current women’s programs.



**DESIGN:** The study design employs qualitative and quantitative tools to structure data collection and analysis. 12 focus groups are conducted with South Asian women across the GTA in which six (6) groups are provided with currently used storytelling tools and six (6) with traditional sexual health and HIV educational fact sheets. The benefits and limitations of storytelling and fact sheets are compared and explored through analysis of pre and post sessions questionnaires and recorded discussion.

**KNOWLEDGE EXCHANGE AND CAPACITY:** As a community based and community driven research project, a large emphasis of the study is on sharing results, findings and on building community capacity so peers can meaningfully participate and lead research. The project employs eight (8) peer leaders who have been trained to deliver and conduct focus groups. To build capacity, peers have key roles in sharing sexual health knowledge and study results in multiple mediums through print, online and through video.

**IMPLICATIONS:** The results of the study are situated on key findings around the potential of storytelling to increase community uptake of sexual health and HIV/AIDS information, and to change attitudes and perceptions of people living with HIV/AIDS, thus tackling stigma. Consequently, these findings have significant implications for sexual health and HIV service provision among South Asian women. The tools assessed in the study are also easily available for scale-up or application within comparable communities of women or ethno-racial populations.

## SS51

### HARD-FOUGHT GAY LIBERATION: “THE BODY POLITIC” IN THE EARLY AGE OF AIDS

McKenzie, Cameron  
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Considered the “house organ of the Canadian gay movement”, The Body Politic is a rich source of the history of activism during the emergence of the AIDS epidemic. Through a Foucauldian-informed content analysis of The Body Politic magazine’s coverage of HIV/AIDS from 1981 to 1987, this paper explores the idea that this serious health issue constituted a defining moment for the Canadian gay rights movement. It uses current, in-depth interviews with activists from the magazine to consider notions of health “from above” and “from below” by examining relations between the community and various levels of government, as well as confrontations with medicalization and the medical profession. The early struggle against the health inequities created by a deadly virus that disproportionately affected a marginalized community in Canada illuminates the intricate and complex power dynamics of the development of a community identity. The movement rose to the challenge of addressing health inequities based on homophobia through advocacy, political action, and even early service provision. I also examine how The Body Politic reported and negotiated issues of the community’s self-policing and “self-managed oppression” through efforts to promote “safer sex” and risk reduction, including the struggle over mandatory versus anonymous testing. Interviewees reflect on the scope of the movement as broader than a struggle for rights or identity, but rather as a liberation movement that sought to embrace feminism, alternative education, anti-racism, and alternative culture and human relations. Ultimately, this paper reflects on the impact of the AIDS era and neoliberalism on a “hard-fought gay liberation”.

## SS52

### INSIDE AND OUT: CHALLENGING STIGMA EXPERIENCED BY WOMEN WITH HIV

Medjuck, Melissa; Seatter, Erin; Summers, Marcie; G, Sangam  
Vancouver, BC

**ISSUES:** Though we have learned a great deal about how to medically manage the progression of HIV, social stigma remains a challenge. It can compromise access to health and supportive community care and significantly influence the lives of women living with HIV (WLHIV). HIV-related stigma is intensified in women because they are women. Research has shown that for WLHIV, receiving and providing peer-driven services results in a range of benefits associated with care and positive effects on their overall health and well-being.

**DESCRIPTION:** Positive Women’s Network (PWN) is the longest running women-specific HIV support and education organization in Canada. Since 2010, PWN has offered 5 annual peer support trainings with 48

WLHIV participants. The training includes a focus on experiences of stigma and how to cope with stigma.

**LESSONS LEARNED:** Participants report that discussion helps distinguish between internal and external sources of stigma; internalized stigma can affect whether they see themselves as even deserving of care and external stigma in health care and community services can limit how and when women seek ongoing access to treatment and support. Participants developed a resource sheet on coping with stigma, written by WLHIV for WLHIV, including tips for physical wellness, psychological wellness, and steps women can take if they feel they are experiencing discrimination.

**CHALLENGES:** Personalized coping strategies do not address the larger systemic forces that cause HIV stigma to persist.

**NEXT STEPS:** Supporting women to identify internal and external stigma messages/ experiences can help women improve self-care, access to health care, and community involvement. Education and campaigns addressing HIV stigma and gendered social and structural violence are proposed.

## SS53

### MAKING ASOS MORE WOMEN-FRIENDLY: MEETING WOMEN WHERE THEY ARE AT

Medjuck, Melissa; Summers, Marcie; G, Sangam; Seatter, Erin  
Vancouver, BC

In Canada, there are 16,600 women living with HIV (WLHIV), 23% of the national total. There is a lack of women-specific HIV services available. WLHIV face specific challenges: biological vulnerability to infection; the invisibility of women with HIV; sexual stigma; power imbalances in relationship; women acting as caregivers with little time for themselves; the dangers of disclosure. Since 1991, Positive Women’s Network (PWN), a partnership of WLHIV and women affected by HIV, has provided a range of leadership, support, and health education. PWN is the only women-specific HIV organization in BC and the longest standing women-specific HIV organization in Canada. As demand grows for gender-specific approaches to HIV support, how can existing ASOs ensure physical safety, emotional safety, validation and connection for women living with HIV? In 2010, PWN conducted a needs assessment. 34 WLHIV from throughout the province were interviewed about their experiences seeking services; staff at ASOs were interviewed about providing services for WLHIV. In 2014, PWN conducted a member engagement survey; topics included: access to and evaluation of PWN programs and resources, feedback on program development. Survey was mailed/mailed to 301 members with a 12% return rate. Drawing on feedback provided from these 2 projects regarding improving services for WLHIV, suggestions for ASOs include: having a childcare policy and subsidies, offering individualized support, engaging WLHIV as peer workers, staff training, women-only safe spaces, developing a best practices procedure for supporting WLHIV. ASOs may be challenged to adopt these suggestions because of: apathy to engaging in gender-specific approaches because of sexism, lack of funding, lack of female clients, the under-representation of WLHIV at all organizational levels of HIV services. Promoting strategies to navigate and overcome the barriers WLHIV face to seeking and engaging with HIV support services is proposed.

## SS54

### TRANSGENDER INDIVIDUALS’ EXPERIENCES IN RESIDENTIAL ADDICTION TREATMENT: NEGOTIATING GENDER AND STIGMA

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<sup>1</sup>Vancouver; <sup>2</sup>Burnaby, BC

**OBJECTIVES:** Transgender individuals who use drugs often have higher rates of HIV infection compared to cisgender populations. Addiction treatment programs can act as an HIV prevention tool by contributing to reductions in drug use and by encouraging adherence to antiretroviral treatment. However, little information is available on the experiences of transgender individuals in addiction treatment. Therefore, we sought to qualitatively investigate the residential treatment experiences of transgender individuals who use illicit drugs in a Canadian setting.

**METHODS:** In-depth semi-structured interviews were conducted with 34 transgender individuals in Vancouver, Canada between June 2012 and May 2013. Participants were recruited from three open prospective

cohorts of individuals who use drugs, an open prospective cohort of sex workers, and through snowball sampling. Theory-driven and data-driven approaches were used to analyze the data and two transgender researchers aided with the coding and the interpretation of data.

**RESULTS:** Among the 34 participants in this study, 16 (47%) reported attending residential treatment in the past and their experiences varied according to whether their gender identity was accepted in the treatment programs. Participants reported a range of challenges associated with accessing and remaining in addiction treatment. Specifically, three themes emerged from the data that characterized individuals' experiences in treatment settings: (1) gender-based barriers to entering treatment, (2) incidents of transphobia and stigmatization perpetuated by staff and clients, and (3) participants leaving treatment prematurely after negative encounters.

**DISCUSSION:** Participants reported a range of challenges associated with accessing and remaining in addiction treatment, which disrupted opportunities for HIV prevention. These findings illustrate the need for gender-based, anti-stigma policies and programs to be established within addiction treatment programs. Additionally, it is vital to expand treatment to include access to medications (e.g., buprenorphine) for transgender individuals who are not comfortable engaging with residential treatment.

## Social Sciences: Social, Structural and Systemic Drivers of HIV

## Sciences sociales : Moteurs sociaux, structurels et systémiques du VIH

### SS55

#### AT THE TABLE WITH PEOPLE WHO USE DRUGS: HOW IS POWER IN DECISION-MAKING BEING SHARED?

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**BACKGROUND:** People who use drugs (PUD) are increasingly included in committees related to policy, service delivery or research. Compared to the general population, PUD are disproportionately affected by HIV and hepatitis C, stigmatization and social exclusion. Such inequity is due in part to current drug policy of criminalization which thwarts harm reduction and health promotion efforts and creates barriers to access to services. The practice of inclusion aims to address these inequities by sharing power in decision-making. There is a gap in understanding whether this strategy works, and if so, how. This study sought to better understand power relations in committees where PUD are at the table.

**METHOD:** In partnership with the Drug Users Advocacy League and the Society of Living Illicit Drugs Users, this participatory critical ethnographic inquiry explored power relations in four committees in Ontario and BC. Data were collected in 2013 through observations of meetings, individual interviews, demographics surveys and document reviews. Power relations were analysed using a framework which combined critical theory and transformative learning to identify factors that contribute to or hinder shared decision-making power.

**FINDINGS:** Shared decision-making power was enabled by opportunities for PUD to be at the table, which were enhanced by the international movement of PUD, policies of inclusion, and leadership. Membership, number of seats for PUD and organizations' commitment to inclusion enhanced shared power while limited organizational capacity and challenges with representation of PUD hindered it. Accommodating PUD's economic realities, including remuneration, contributed to equitable participation. Negative views of PUD were still present. Power relations were improved when stigma was addressed both critically and with sensitivity. Social activities, negotiated relationships, democratic practices and skilled facilitation nurtured shared decision-making power.

**CONCLUSION:** Practice implications for more equitable inclusion and future research directions are offered.

### SS56

#### A SAFER INDOOR WORK ENVIRONMENT SCALE: THE IMPACT OF COMMUNITY ORGANIZATION, POLICY AND PHYSICAL FEATURES OF INDOOR SEX WORK VENUES ON CONDOM USE AMONG INDOOR SEX WORKERS IN VANCOUVER, CANADA

**Duff, Putu; Shoveller, Jean; Dobrer, Sabina; Ogilvie, Gina; Montaner, Julio; Chettiar, Jill; Shannon, Kate**  
Vancouver, BC

**OBJECTIVES:** Despite growing evidence on the critical role of sex work venue type on HIV prevention, few studies have sought to disentangle the influence of various workplace features on sex workers (SWs') sexual and reproductive health practices, particularly in industrialized settings. This study therefore examined the associations between social cohesion, physical and policy workplace features on condom use for pregnancy prevention among indoor SWs.

**METHODS:** Data were drawn from the AESHA project (An Evaluation of Sex Workers' Health Access), a prospective open cohort of SWs from Metro Vancouver, aged 14+ years. Using factor analysis, a "Safer Indoor Work Environment Scale" was developed to measure the supportiveness of SWs' venues, by cataloguing a range of indoor work environments including: safety policy and managerial practices (Cronbach alpha= 0.903); sexual/reproductive health services (Cronbach alpha= 0.960), drug harm reduction services (Cronbach alpha= 0.926), security features (Cronbach alpha=0.698), and social cohesion (Cronbach alpha=0.919). Six multi-variable models were built using generalized estimating equations (GEE) to determine the association between indoor venue features and social cohesion on condom use.

**RESULTS:** Of 588 indoor SWs, 63.6% used condoms for pregnancy prevention in the last month. In multivariable GEE analysis, the following venue-based features were significantly correlated with condom use for pregnancy prevention: managerial practices and venue safety policies (Adjusted Odds Ratio (AOR)=1.09; 95% Confidence Interval (95% CI) 1.01-1.17) access to sexual and reproductive health services/supplies (AOR=1.10; 95% CI 1.00-1.20) access to drug harm reduction (AOR=1.13; 95% CI 1.01-1.28), and social cohesion among workers (AOR=1.05; 95% CI 1.03-1.07). Security features access was marginally associated with condom use (AOR=1.13; 95% CI 0.99-1.29).

**DISCUSSION/CONCLUSIONS:** These findings suggest that a range of venue-based features and community interventions may enhance SWs' ability to use condoms. There is a need to further explore the role of such venue- and community-based interventions in mitigating the expected harmful effects of Canada's recently adopted anti-prostitution laws.

### SS57

#### YOUNGER AGE, HOMELESSNESS, AND GENDER DYNAMICS OF INTIMATE PARTNERS AS BARRIERS TO ACHIEVING PLASMA VIRAL LOAD SUPPRESSION AMONG SEX WORKERS ON HAART, INDEPENDENT OF ADHERENCE

**Duff, Putu; Montaner, Julio; Goldenberg, Shira; Nguyen, Paul; Dobrer, Sabina; Shannon, Kate**  
Vancouver, BC

**OBJECTIVES:** Despite global evidence that sex workers (SWs) are disproportionately impacted by HIV infection, data on HIV treatment outcomes among SWs remains sparse. This study therefore aimed to identify correlates of plasma viral load (PVL) suppression among HIV seropositive street- and off-street SWs on HAART in Vancouver, Canada.

**METHODS:** Our analyses drew on 2010-2012 data from a longitudinal cohort of cis- and trans-gendered SWs known as AESHA (An Evaluation of Sex Workers Health Access), linked to the BC Centre for Excellence in HIV/AIDS' Drug Treatment Program (DTP) data for HAART dispensation and disease monitoring. The analytic sample was restricted to 74 HIV seropositive SWs (14+ years) who had initiated HAART prior to baseline. Bivariate and multivariable logistic regression using generalized estimating equations (GEE), were employed to identify longitudinal correlates of PVL suppression, defined as plasma RNA viral load <50 copies/mL3.

**RESULTS:** The baseline median age of the sample was 35 years old (Interquartile range: 29.0-43.0), with 63.5% reporting Aboriginal ancestry. While

60.8% of women achieved PVL suppression, only 27.0% maintained PVL suppression from baseline. In multivariable GEE analyses,  $\geq 95\%$  adherence (AOR= 5.04; 95% CI 2.62-9.73) and older age (AOR=1.07; 95% CI 1.03-1.13) were positively correlated with PVL suppression. Having an intimate partner (AOR=0.46; 95% CI 0.22-0.96) and homelessness (AOR=0.44; 95% CI 0.26-0.74) were negatively correlated with PVL suppression.

**DISCUSSION/CONCLUSIONS:** Even after adjusting for adherence, having an intimate partner reduced the odds of PVL suppression, suggesting a need to more closely consider the gender dynamics surrounding serostatus disclosure with SWs' intimate partners. This research highlights the need for increased attention to the social and structural factors shaping HIV treatment outcomes. Combination interventions, including youth and couple-level strategies remain critical, alongside access to stable housing women-centred approaches to HIV care for SWs.

## SS58

### THE 'QUEER WOMEN CONVERSATIONS' GROUP-BASED HIV AND STI PREVENTION INTERVENTION FOR LESBIAN, BISEXUAL, QUEER AND OTHER WOMEN WHO HAVE SEX WITH WOMEN IN TORONTO AND CALGARY, CANADA: RESULTS FROM A NON-RANDOMIZED COHORT PILOT STUDY

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<sup>1</sup>Toronto, ON; <sup>2</sup>Calgary, AB

**BACKGROUND:** Lesbian, bisexual, queer (LBQ) women and other women who have sex with women (WSW) are vulnerable to sexually transmitted infections (STI), including HIV. Yet structural drivers of HIV/STI among WSW, such as sexual stigma, are underexplored. Scant research has evaluated HIV/STI prevention interventions among this population. The Queer Women Conversations (QWC) study pilot tested a group-based HIV/STI prevention intervention with WSW in Toronto and Calgary, Canada.

**METHODS:** We conducted a multicentre, non-randomised pragmatic cohort pilot study using a pre-test/post-test design with 6-week follow-up. The intervention was developed in collaboration with community-based organizations in Calgary and Toronto, informed by key informant interviews (n=6), and theoretically grounded in the social ecological model. The primary outcome was sexual risk practices, and secondary outcomes included intrapersonal (self-esteem, STI knowledge, resilient coping), interpersonal (safer sex self-efficacy), social (community connectedness, social support) and structural (sexual stigma, healthcare access) factors.

**RESULTS:** Forty-four women (mean age 28.7 years) participated in a weekend retreat consisting of six consecutive sessions tailored for LBQ women. Sessions covered topics addressing social and structural drivers of HIV/STI and sexual risk practices, including STI information, safer sex negotiation, healthcare access, and sexual stigma. Adjusted for socio-demographic characteristics, sexual risk practices ( $\beta_2 = -2.96$ , 95% CI -4.43, -1.50), safer sex self-efficacy ( $\beta_2 = 2.78$ , 95% CI 0.82, 4.78), STI knowledge ( $\beta_2 = 4.41$ , 95% CI 3.52, 5.30) and sexual stigma ( $\beta_2 = -2.62$ , 95% CI -3.48, -1.75) scores showed statistically significant changes 6 weeks post-intervention.

**CONCLUSIONS:** QWC is among the first studies to address social and structural drivers of HIV/STI among WSW. The QWC intervention was effective in impacting several inter/intra personal and structural factors. Initial increases in social support and community connectedness were not sustained, highlighting the need for alternative approaches to influence social factors. Study results may inform HIV/STI prevention interventions tailored for LBQ women.

## SS59

### WHERE EVERYBODY KNOWS YOUR NAME: EXPLORING THE IMPACT OF A HEALTH-EQUITY-ORIENTED APPROACH ON TREATMENT ADHERENCE IN AN INTEGRATED CARE FACILITY FOR PEOPLE LIVING WITH HIV AND AIDS MARGINALIZED BY SOCIAL STRUCTURAL INEQUITY

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**BACKGROUND:** The Dr. Peter Centre (DPC) is a low-threshold care facility for People Living with HIV in Vancouver who experience concurrent barriers to achieving optimal therapeutic outcomes. There is no documented evidence of the impact of the DPC's health-equity approach on the health outcomes of clients. Here we report on the relationship with adherence to antiretroviral treatment (ART).

**METHODS:** A longitudinal cohort of recently enrolled DPC clients provides the data frame for this analysis. Socio-demographic, relevant social determinants of health, and health and social service utilization data are ascertained through an interviewer-administered survey. Clinical variables are obtained through longitudinal linkages with the provincial Drug Treatment Program. The survey adapts a set of eight health-equity indicators (HEI) designed to measure clients' perception of the DPC based on a likert response scale, which were then trichotomized as positive (always/most of the time), neutral (sometimes) and negative (not usually/never). Univariate analyses were conducted to measure the association between optimal ART adherence ( $\geq 95\%$ ) in the 12 months prior to interview date and salient explanatory variables, including positive responses to the HEI.

**RESULTS:** This analysis is based on the 74 out of 99 participants who completed the baseline interview between February 2012 and December 2014, and for whom we have an up-to-date clinical linkage. Median age was 46.5 (IQR 41-51), 18.9% were female, 31.1% identified as Aboriginal and 45.9% were optimally adherent to ART. The three HEI that were most frequently ranked positively were feeling: welcomed by staff (95.9%), respected by staff (95.9%), and cared for by staff (89.2%). In univariate analyses, only higher income was associated with optimal adherence ( $p=0.031$ ). None of the HEI attained statistical significance.

**CONCLUSION:** The HEI fell short in explaining the disparity in ART adherence, potentially a reflection of the adherence measure being taken during a time period when the client was not engaged in DPC services. More in-depth consultation with clients is underway to refine the indicators and isolate the impact of a health-equity oriented approach to care.

## SS60

### PREVENTION OF SEXUALLY TRANSMITTED AND BLOOD BORNE INFECTIONS AMONG OLDER ADULTS

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Ottawa, ON

**ISSUES:** Rates of sexually transmitted and blood borne infections (STBBIs) among older adults in Canada have increased over the past decade due to a variety of interpersonal, community and environmental factors. The number of older adults living with chronic STBBIs such as HIV and hepatitis C also continues to rise. The Public Health Agency of Canada has developed a Questions and Answers resource to address the most commonly asked questions about the prevention of STBBIs among older adults. **METHODS:** This resource was developed through a synthesis of findings from a systematic review of the literature related to the key determinants of STBBI vulnerability among older adults

**FINDINGS:** Individual, interpersonal, and community factors including: knowledge, risk perception and awareness, communication and relationships contribute to increased STBBIs rates among older adults. Ageism and discrimination, social connectedness, mental health, socio-economic status, and the intersection of aging with gender, culture and sexual orientation are key determinants of vulnerability to STBBIs among older adults. Findings suggest that: a) acknowledging the importance of sexual health for older adults; b) recognizing the influence of life events and transitions in people's lives; c) establishing multiple points of service access; d) intersectoral collaboration; e) including



older adults in program development and delivery; and f) incorporating age and culturally appropriate approaches, have the potential to improve health outcomes and prevent STBBIs among older adults.

**RECOMMENDATIONS:** Community organizations, health professionals and service providers are encouraged to use the findings in this resource to help guide the development and implementation of STBBI prevention interventions that address the needs of older adults living with or at risk of STBBIs. Increased inclusion of older adults in research addressing STBBI prevention is needed in order to build evidence on effective interventions among this population.

## SS61

### AN ETHNO-EPIDEMIOLOGICAL STUDY OF THE IMPACTS OF REGULATORY CHANGES TO BRITISH COLUMBIA'S PROVINCIAL METHADONE PROGRAM ON HIV RISK AND TREATMENT AMONG A STRUCTURALLY VULNERABLE DRUG-USING POPULATION

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<sup>1</sup>Vancouver, BC; <sup>2</sup>Sydney, NSW, Australia; <sup>3</sup>Burnaby, BC

**BACKGROUND:** Although methadone maintenance treatment (MMT) has been found to reduce HIV risk behaviours and promote HIV treatment adherence among drug-using populations, little is known regarding how regulatory changes influence MMT engagement and related outcomes. In British Columbia (BC), provincial regulations governing MMT have recently been modified, including: replacing the existing methadone formulation with Methadose® (pre-mixed and 10 times more concentrated); prohibiting pharmacy delivery of methadone; and, prohibiting pharmacies incentives for methadone dispensation. We undertook this study to examine how these changes shaped MMT engagement and HIV risks and treatment adherence among a structurally vulnerable drug-using population enrolled in MMT in Vancouver, BC.

**METHODS:** Qualitative interviews were conducted with 34 people enrolled in MMT and who were recruited from two ongoing observational prospective cohort studies comprised of drug-using individuals in the six-month period following the changes to the provincial methadone program. Interview transcripts were analyzed thematically, and by drawing on the concept of 'structural vulnerability'.

**FINDINGS:** These regulatory changes disrupted MMT treatment engagement, and thereby fostered HIV risks and treatment interruptions. The introduction of Methadose® precipitated increased withdrawal symptoms. The discontinuation of pharmacy delivery services led to interruptions in MMT and co-dispensed HIV medications due to constraints stemming from poverty and housing instability. Meanwhile, the loss of pharmacy incentives limited access to material supports utilized by participants to overcome barriers to MMT. Collectively, these changes functioned to compromise MMT engagement and increased structural vulnerability to HIV treatment interruptions and risks, including re-initiation of injection drug use and participation in high-risk income-generating strategies.

**CONCLUSION:** Greater attention to the impacts of structural inequities on MMT engagement and related HIV outcomes is needed when modifying MMT programs, especially with other provinces moving to introduce similar changes. Comprehensive environmental supports should also be provided to minimize adverse outcomes during transitional periods.

## Social Sciences: Substance Use, Transmission Networks and Local Contexts of HIV Risk

## Sciences sociales : Toxicomanies, réseaux de transmission et contextes locaux du risque concernant le VIH

## SS62

### WHY KIT MOBILE?

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 Montreal, QC

CACTUS Montreal has been offering harm reduction services to the downtown community for several years. While its' fixed needle exchange program is well utilized, the need for another service delivery model was identified. The "Messages de rue" program was put in place in 2010, with the aim of increasing access to harm reduction supplies through street-based peer intervention. Since June 2014 we started a service called Kit Mobile. Kit Mobile was made possible through a prevention grant on HIV, hepatitis and other sexually transmissible infections in the Montreal area from the Director of Public Health at the Agence de la santé et des services sociaux de Montréal.

Kit Mobile is an injection material delivery service for injection drug users (UDI).

According to the SurvUDI 2010 study, sharing injection material is the main cause for the spread of STBBI among injection drug users.

In order to decrease this spread a project involving 8 organizations identified the delivery of sterile injection material in communities as an innovative practice that would help reach injection drug users, whatever their life situation.

The Kit Mobile delivery service aims to reach people who do not use conventional outreach services. Teams from able partner organizations carry out deliveries in the areas needing the service.

CACTUS have the "Messagers de rue" team already in place which constitutes current or former drug users, and/or working in the sex industry. The Messagers are provided with training on a range of issues including HIV, hepatitis C, harm reduction and safe needle disposal. They are supported by a Program Coordinator and a Support Worker, who offers guidance while out on the streets.

In addition to providing clean works, the Messagers also act as harm reduction promotion agents. Meeting people "where they are" in their experience of addiction, the Messagers help their peers to better understand and reduce risks related to drug-use, and encourage them to seek testing and treatment for STBBIs.

## SS63

### THE INTERRELATIONS BETWEEN THE ADDICTION TRAJECTORIES AND THE GAY LIFE COURSE EXPERIENCE AMONG GAY AND BISEXUAL MEN IN MONTREAL

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 Montréal, QC

The problematic consumption of psychoactive substances (PAS) constitutes a health problem for certain gay/bisexual men. The present qualitative descriptive study, inscribed in symbolic interactionist perspective, aims to: 1) describe and understand the interrelations between certain dimensions of the gay life course experience and the consumption trajectories of PAS among gay and bisexual men; 2) document their experience in relation to their use of addiction services; 3) establish links between their experiences and their gay life course experience; and, 4) identify their needs in matter of services. Thirty five semi-structured interviews were conducted with gay/bisexual men, who have a problematic consumption of PAS and have an average age of 46 years. The whole material has been analysed thematically.

The addiction trajectories and the homosexual experience intersect at the time of the discovery and acceptance of homoerotic desires, during sexual

experimentation; when finding a sexual/emotional partner; and as part of the socialization in the gay community, particularly in sexualized spaces. Most participants have used substance abuse services but only about half of them have received a reference to such services. The increase in consumption often emerges when they have problems accepting their sexual orientation, during sexual experimentation or when they receive an HIV diagnosis. The increase of consumption associated to these life events sometimes leads the participants to question their consumption and to demand help from a specialized service. For certain participants their consumption has not been detected in a good moment. Moreover, sexuality is not addressed in the addiction services.

The results show the relevance of considering the different dimensions of the homosexual experience, including sexuality, in the prevention strategies for consumption as well as in the addiction therapies for this population. In addition, the detection of problematic consumption in this population represents a challenge.

## SS64

### ASSESSING THE COMPREHENSIVENESS OF HIV PREVENTION, TREATMENT AND CARE SERVICES FOR PEOPLE WHO INJECT DRUGS IN NORTHERN BC

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Canada has had limited success in addressing HIV/AIDS among People Who Inject Drugs (PWID). This is of growing concern, particularly, in the northern regions of the western Canadian provinces where the rate of new infections has grown in opposition to stabilized or declining trends elsewhere and healthcare systems are struggling to manage the increased number of cases.

The purpose of this study was to determine the comprehensiveness of existing services for HIV prevention, treatment and care for PWID, specifically in northern BC, and recommend targets for additional services, and/or stepping-up or scaling-down of existing services.

This project, using a Community Based Research (CBR) model, was completed in four phases: (1) mapping of existing services in northern BC, based on a Comprehensive Package listed in the 2012 WHO Technical guide for countries to set targets for universal access to HIV prevention, treatment and care for injecting drug users; (2) an adaptation of the WHO Guide to the local northern BC context and the development of interview guides to be used in the next Phase, through individual and/or group discussions with a Community Advisory Committee (CAC); (3) the collection of primary information through key informant interviews with three distinct populations, including service users, frontline staff, and managers/decision-makers; and (4) reconvening with the CAC to discuss the most appropriate and effective way to translate the knowledge gained in this study.

Results from the project included a detailed overview of current services, as well as an assessment of service gaps and needs, based on information gathered through meetings with a 10 person CAC and interviews with 52 participants throughout northern BC. The final outcome of this exercise was a set of recommendations for implementing, monitoring, and stepping-up or scaling-down services for PWID in northern BC.

## SS65

### FACTORS ASSOCIATED WITH NON-FATAL OVERDOSE AMONG YOUTH IN OTTAWA WHO USE DRUGS: EVIDENCE TO DRIVE PREVENTION INTERVENTIONS

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Wilson, Lindsay A; Shurgold, Jayson; Vannice, Sarah E;  
Project Rock Research Team, The  
Ottawa, ON

**BACKGROUND:** Increasing numbers of Ottawa youth who use drugs drove request from community for study to examine the HIV- and HCV-related risk environment experienced to inform the development of age- and gender-fluid harm reduction interventions. This paper uniquely examines factors associated with non-fatal overdose – an all too frequent occurrence among Ottawa youth.

**METHODS:** November 2013 personal structured interviews with 125 young people aged 16-25 who were capable of informed consent

and had either ever injected drugs or smoked crack or had used >2 hard drugs in the past 3 months. Dried blood spot samples collected for HIV and HCV testing.

**RESULTS:** HCV prevalence 16% among women (95% CI 5.3, 34.20) among men 14% (95% CI 8.5, 23.4).

The majority of women (53%) and men (71%) had seen someone else overdose and close to the majority of both women (47%) and men (49%) had themselves overdosed. Mean overdoses among men 3.6, range 1–20; among women 2.9, range 1-10. Youth with history of injecting drugs twice as likely to overdose (OR 2.4, 95% CI: 1.1, 4.8); who binged three or more times a month three times as likely to overdose (OR 3.4, 95% CI: 1.1, 10.5) as were youth who had tried unsuccessfully to get into drug treatment (OR 3.2, 95% CI: 1.2, 8.0); and youth who used opiates were six times as likely to overdose (OR 5.9, 1.9, 18.6).

**CONCLUSION:** Youth who use and inject drugs are an increasing demographic in Ottawa and are a population whose HIV- and HCV-related risk environment and prevention needs are not widely known or understood. Documenting factors associated with non-fatal overdose among this population is key to enabling community agencies to identify youth with substance use disorders at high risk of adverse outcomes and in driving the development of evidence-informed responses; particularly expansion of drug treatment programmes.

## SS66

### AGE RESTRICTIONS FOR SUPERVISED INJECTION FACILITIES: IMPLEMENTATION CONSIDERATIONS

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Toronto, ON

Despite a landmark Supreme Court ruling, Canada has not yet seen new supervised injection facility (SIF) implementation. Developing rules and policies at SIFs that are appropriate for local needs is challenging, and age restrictions represent a topic that is likely to be especially contentious in the Canadian context. People under age 18 who inject drugs represent a population with high needs for health and social services, including education on HIV and hepatitis C prevention. Internationally, age restrictions at harm reduction programs often formally exclude this population. We documented the perspectives of people who use drugs and other stakeholders regarding whether SIFs should have age restrictions. Interviews and focus groups were conducted with a total of 95 people who use drugs and 141 other stakeholders in Toronto and Ottawa. Consensus regarding SIF age restrictions was elusive. Some people who use drugs and other stakeholders did not specify minimum age(s) for SIF access, while others recommended minimums (e.g., 16, 19). For many participants, including people who use drugs, the thought of people under 18 injecting drugs generated great discomfort. This discomfort appeared to contribute to difficulty accepting SIFs as a potential response to injection drug use by young people. Participants invoked notions of vulnerability and recommended that it was more important that youth receive “help” than access to SIFs, suggesting that there is still opportunity to prevent youth from becoming adults who continue to use drugs. At the same time, participants stated that young people make their own decisions and said that those who continue using drugs would benefit from the safer environments that SIFs provide. This study contributes new empirical insights regarding youth access to important HIV prevention and health services. Such considerations may help establish optimal age-related policies for harm reduction programs.

## SS67

### SELF-ASSESSED MENTAL HEALTH AMONG OTTAWA YOUTH WHO USE DRUGS AND ASSOCIATION WITH HIV- AND HCV-RELATED BEHAVIORS AND PRACTICES

Leonard, Lynne E; Germain, Andr  e; Pelude, Linda;  
Wilson, Lindsay A; Shurgold, Jayson; Vannice, Sarah E;  
Project Rock Research Team, The  
Ottawa, ON

**BACKGROUND:** Increasing numbers of Ottawa youth who use drugs drove request from community for study to examine the HIV- and HCV-related risk environment experienced to inform the development of age- and gender-fluid harm reduction interventions. This paper uniquely examines

participant's self-assessment of their mental health and impact on HIV- and HCV-related risk behaviors and practices.

**METHODS:** November 2013 personal structured interviews with 125 young people aged 16-25 who were capable of informed consent and had either ever injected drugs or smoked crack or had used >2 hard drugs in the past 3 months. Dried blood spot samples collected for HIV and HCV testing.

**RESULTS:** HCV prevalence 16% among women (95% CI 5.3, 34.20) among men 14% (95% CI 8.5, 23.4).

The majority of women (65%) and nearly half of the men (46%) self-assessed their mental health as fair or poor.

Youth who reported non-consensual sex were significantly more likely to assess their mental health as poor or fair (OR 2.8 95% CI: 1.2, 6.8) as were: younger participants aged 16-21 (OR 2.9, 95% CI: 1.4, 6.1); those who reported any form of emotional or physical abuse or neglect (OR 3.8 95% CI: 1.3, 11.3); and youth who reported thoughts of suicide or hurting self (OR 5.5 95% CI: 2.5 12.1).

Of concern, among youth who responded to questions about sharing drug injection equipment, those who reported poor mental health were significantly more likely than those who reported better mental health to report sharing needles ( $p=0.004$ ) and sharing other injecting equipment ( $p=0.07$ ).

**CONCLUSION:** Youth who use and inject drugs are an increasing demographic in Canada. Documenting factors associated with self-assessment of poor mental health among this population is key to enabling community agencies to identify youth with substance use disorders at high risk of engagement in HIV- and HCV-related risk behaviors and practices.

## Social Sciences: The Health of African, Caribbean and Black Communities

## Sciences sociales : La santé des collectivités africaines, antillaises et noires

### SS68

#### A NARRATIVE INQUIRY INTO THE EXPERIENCES OF SUB-SAHARAN AFRICAN IMMIGRANTS LIVING WITH HIV IN ALBERTA, CANADA: CONSIDERING SACRED AND MUNDANE STORIES

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<sup>1</sup>Calgary; <sup>2</sup>Edmonton, AB

In this narrative inquiry study, we focused on the lives of three African immigrants living with HIV in Alberta, Canada. Living alongside each participant over a period of a year, we attended to the phenomena of living with HIV as an African immigrant in Canadian society. We discovered that each participant had searched for narrative coherence across geographic, political and social spaces, and lived their lives in the midst of a continuous unfolding life narrative. That is, people's lived experiences were located along the dimensions of time, place, and the personal and social. Participants' lives continued to unfold against and within a familial, cultural, and social particularity that had not been left behind in their home countries. In this presentation, we will make visible the stories that participants carried across different spaces and examine how these stories shaped their experiences of living with HIV in their new host country of Canada. In this presentation we will also discuss notions of sacred and mundane stories, to show how time, context and place interconnect. These interconnections have profound effects on narrative coherence and the (dis)continuity of narratives in the life making of immigrants. We will highlight the social significance of participants' experiences, attending particularly to their sacred and mundane stories, and present key considerations for support and intervention work with the African immigrant community affected by HIV in Canada.

### SS69

#### SOCIAL AND SEXUAL SCRIPTING OF RISKIER SEX AMONG AFRICAN, CARIBBEAN, AND BLACK YOUTH IN WINDSOR, ONTARIO

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<sup>1</sup>Windsor, ON; <sup>2</sup>Louisville, KY, USA; <sup>3</sup>Toronto; <sup>4</sup>Brantford, ON

African, Caribbean and Black (ACB) people carry a disproportionate burden of HIV infection. This CIHR funded study examines the placement of "riskier sex" (RS) in the social and sexual scripts of ACB youth.

**METHOD:** Between April, 2013 and March, 2014, 543 16-25 year old ACB participants living in the Windsor area of Ontario, recruited using Respondent Driven Sampling, completed a survey inquiring about sexual behaviours and social/living situations. Riskier sex (RS) was measured on a 7-point scale combining information about penile-vaginal (PVI) or anal (AI) intercourse, number of lifetime partners, partner concurrency, and condom use. Logistic regression examined social correlates of ever engaging in PVI and/or AI. OLS regression examined sexual and social correlates of level of risk on the RS scale.

**RESULTS:** Ever engaging in PVI or AI was significantly associated with being older, using more sexual health services, spending more leisure time with friends, and spending less leisure time in religious activities. African youth postponed PVI and AI longer than other groups. Riskier sex developed over time with those who were sexually active longer having significantly higher scores on the RS scale. It was embedded in sexual scripts that included non-relational sex. The social profile of youth who engaged in riskier sex included living in distressed neighborhoods, living independent of natal family, birth in Canada, and spending more leisure time playing sports or in gyms. There was no difference in RS scores across the ACB ethno-racial groups and predictors/correlates did not differ by sex.

**CONCLUSION:** Results contribute to knowledge about social and sexual correlates of riskier sex among ACB youth, an area of sparse research. They also provide guidance for prevention programming in terms of important social associated with (e.g., sports teams and gyms; distressed neighborhoods; independent living) and the sexual scripting of riskier sex in this population.

### SS70

#### THE IMPACT OF CRIMINALIZATION OF NON-DISCLOSURE OF HIV POSITIVE STATUS ON RACIALIZED COMMUNITIES

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Toronto, ON

In Canada, since the late 80's, there have been over 70 convictions and more than 90 HIV-positive people have been on trial for having unprotected sex, even when no HIV transmission occurred (Mykhalovskiy, 2010). Notably, the *Cuerrier* decision (1998) by the Supreme Court of Canada became a landmark case that ruled that a person living with HIV who does not disclose his or her HIV-positive status and exposes another person to a "significant risk" of HIV transmission, could be found guilty of aggravated assault (Symington, 2009). The majority of cases of persons convicted under HIV criminalization legislation in Canada were African/Black men (ACCHO, 2010). This presentation will examine the impact of criminalization of non-disclosure of HIV positive African/Black people living with HIV from a historical and contemporary transnational perspective. This presentation utilizes an intersectional anti-oppression, social determinant of health approach to examine African/Black communities affected by HIV/AIDS in the greater Toronto area as well as its international impact. Specifically, this presentation will discuss my research findings on the experiences and responses to the impact of criminalization of non-disclosure of HIV positive status and increased HIV stigma on African Diasporic communities from the perspectives of African/Black women and men living with HIV; service providers (therapist, case workers, social workers) and agency directors working in the HIV Sector; and the legal sector (politicians, lawyers and/or judges). This presentation is relevant to the conference themes as it offers a critical look at an anti-oppression/anti-colonial analysis on criminalization of non-disclosure of HIV positive status and the impact on the health of African/Black communities.



## SS71

# THE CRIMINALIZATION OF HIV NON DISCLOSURE: WHAT DOES IT MEAN FOR POLICY AND PRACTICE FOR A WOMEN-SPECIFIC ASO?

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**ISSUES:** In Canada, the majority of women living with HIV (WLHIV) were infected through heterosexual sex. Over the last decade, prosecutions for nondisclosure of HIV has increased. Many ASOs have developed position statements advocating against HIV criminalization, arguing that criminal law is ineffective and inappropriate to address HIV exposure. Positive Women's Network (PWN), a partnership of WLHIV and women affected by HIV, is the only women-specific HIV organization in BC and currently has over 750 "members" (WLHIV). PWN is in a unique position since it must take into account the use of the criminal law from the perspective of a group with distinct concerns: infected and affected women.

**DESCRIPTION:** From 2010-2014, PWN conducted 6 focus groups with a total of 60 WLHIV participants. Topics included level of knowledge about nondisclosure laws, level of comfort disclosing to sexual partners, family and friends, level of comfort sharing information about nondisclosure laws with peers. Diversity of participants is representative of PWN's membership demographics.

**LESSONS LEARNED:** Drawing on focus group discussions, there are mixed and contentious views: criminalization denounces and deters dishonest men who put women's health at risk; criminalization puts vulnerable women, such as those in abusive relationships, at higher risk; criminalization deters women from reporting sexual assault because the perpetrator could counter with nondisclosure allegations, criminalization perpetuates HIV stigma; criminalization adds another barrier to disclosure and testing. The majority of participants did not know current nondisclosure legislation.

**CHALLENGES:** Emotional distress about the topic, language barriers, literacy issues, the complexity and ever changing nature of the legislation.

**NEXT STEPS:** Our results indicate that women-specific HIV services face challenges to taking a position on the criminalization of HIV non-disclosure because of the complex realities of sexual practice and gender, gendered violence, and HIV stigma. Promoting in-person education about nondisclosure legislation for WLHIV is proposed.

## SS72

# IT TAKES TWO TO TANGO? UNDERSTANDING THE RHETORIC OF RESPONSIBILITY IN THE TIME OF CRIMINALIZING HIV NON-DISCLOSURE

Speakman, Erica R Hamilton, ON

In 2009, Johnson Aziga was found guilty of two counts of first-degree murder, along with multiple counts of aggravated sexual assault, and was subsequently declared a dangerous offender. Using the discussion surrounding this unique case, this paper explores claims about responsibility. This paper shows how the rhetoric of responsibility has shifted from one of mutual responsibility concerning safe sex practices to one that puts the onus on those who are aware of their HIV-positive status. The discussion surrounding the Aziga case has generated a dichotomization between 'victims' and 'non-disclosers', with understandings of responsibility at the core. This paper employs a social constructionist perspective as an analytical tool to better understand the creation and strategic uses of these categorizations. The paper also establishes the relevance of Talcott Parsons' concept of the 'sick-role' in understanding how these categories and typifications work. With the criminalization of HIV non-disclosure on the rise, it becomes important to understand the rhetorical bases and justifications for taking a criminal, rather than solely a public health, approach to dealing with HIV transmission. Understanding this process will shed light not only on how those who do not disclose their HIV-positive status are perceived and treated, but may also provide insights into the repercussions on the HIV/AIDS community as a whole, including the exacerbation of HIV-related stigma.

## Social Sciences: Other

## Sciences sociales : Autres

## SS73

# OPPORTUNITIES AND CHALLENGES OF ORGANIZATIONAL INTEGRATION OF AN HIV-POSITIVE STATUS DISCLOSURE INTERVENTION

Barry, Asiatou<sup>1</sup>; Tharao, Wangari<sup>1</sup>; Muchenje, Marvelous<sup>1</sup>; Ongoiba, Fanta<sup>1</sup>; Walker, Glen<sup>3</sup>; Owino, Maureen<sup>1</sup>; Jose, Murray<sup>1</sup>; Stein, Nicci<sup>1</sup>; Ali, Roxanne<sup>2</sup>; Cameron, Ruth<sup>4</sup>; Ryan, Shannon<sup>1</sup>; Pierre-Pierre, Valérie<sup>1</sup>

<sup>1</sup>Toronto; <sup>2</sup>Hamilton; <sup>3</sup>Niagara; <sup>4</sup>Kitchener, ON

**INTRODUCTION:** Disclosure is linked to reductions in HIV transmission; adherence to medical regimens; access to support services; improved mental health status; and effective adaptation to living with HIV. Yet, it has remained a significant challenge for HIV/AIDS service providers to successfully incorporate into support and treatment programs. The HIV disclosure intervention developed in Ontario provides a systemic way to guide AIDS Service Organizations (ASOs) to support their clients' disclosure efforts through a controlled and managed process. This study explores opportunities and challenges of adopting the intervention within ASOs in Ontario.

**METHODOLOGY:** In 2012/14, we conducted an extensive literature review to identify existing guidelines on intervention integration and facilitators/inhibitors of organizational adoption of HIV disclosure intervention. We reviewed both published and 'grey' literature to ensure inclusion of a broad range of information including from community-based settings. We also conducted 4 focus groups with organizational management; peers/volunteers; support workers; and women living with HIV to identify unique possibilities and challenges of intervention integration.

**FINDINGS:** The key identified facilitators of integration included: the use of focus groups and key informant interviews to guide the process; the incorporation of peers and support groups to implement intervention; identifying roles and responsibilities to allow for efficient and effective application of intervention; creation of supportive learning environments to share knowledge and build capacity; and organizational assessment/review to identify how interventions would impact service delivery.

Identified challenges included: mitigating clients' internalized stigma and ensuring safety; social class contentions in small cities; issues of support for those being disclosed to; and limited resources to train staff and peers implementing intervention.

**CONCLUSION:** Disclosure is an effective HIV prevention strategy and when managed properly, it can be beneficial for both the person disclosing and the person being disclosed to. Our study highlights the significance of strengthening organizational infrastructures to support integration of the HIV disclosure as part of their overall service delivery.

## SS75

# RESULTS OF THE ENGAGEMENT OF NEW PUBLIC HEALTH RESEARCHERS IN INTERDISCIPLINARY HIV COMMUNITIES OF PRACTICE: THE UNIVERSITIES WITHOUT WALLS TRAINING PROGRAM

Hastings, Colin<sup>1</sup>; Ibanez-Carrasco, Francisco<sup>1,2</sup>; Worthington, Catherine<sup>3</sup>; Rourke, Sean<sup>1</sup>; Bacon, Jean<sup>1</sup>; Hatzipantelis, Maria<sup>1</sup>

<sup>1</sup>Toronto, ON; <sup>2</sup>Winnipeg, MB; <sup>3</sup>Victoria, BC

**BACKGROUND:** A recent Canadian Association for HIV Research (CAHR) report calls for training initiatives that will produce trainees who are better equipped for careers in HIV research (Campbell, M., & Bisby, M., 2013). Universities Without Walls (UWW) a CIHR-funded HIV training program, bridges the gap between academic research and "on the ground" work in public health through an online and in-person curriculum of community-based research (CBR), research ethics, interdisciplinarity, and community service learning. Here, we assess the strengths and challenges of UWW through an analysis of the evaluation of five generations

(2009-2014) of Fellows' experience with, and knowledge of, core UWW components using a modified Kolb (1984) experiential learning scale.

**METHODS:** Each UWW fellow completes a "retrospective post-then-pre" evaluation (Lam, T. C. & Bengo, P., 2013) and a brief written reflection of their fellowship. The evaluation team, co-led by UWW fellow and UWW core mentors, conducted thematic analysis on narratives from the 61 fellows and summarized the results according emerging themes.

**RESULTS:** Forty-six (75%) were graduate students, 8 (13%) were community fellows, 7 (12%) were health professionals and 9 (15%) disclosed they were HIV positive. Overall, 63% of fellows were in the top 10% of their previous cohort and nearly 75% of fellows had a multi-disciplinary background. Four key results emerged: 1) developed a "community of practice" with other researchers and mentors that break down geographic, disciplinary and academic-community barriers; 2) increased confidence in conducting inclusive, community-driven CBR; 3) enhanced professional skills to link research with community practice; 4) increased self-reported knowledge, skills and experience along the core UWW components from "novice/advance beginner" to "competent/proficient", and 5) published 52 peer-reviewed articles of which 22 (42%) were in the top 5 journals in their field.

**DISCUSSION:** UWW encourages fellows' participation in HIV research communities of practice, builds confidence in new researchers, encourages the retention of promising researchers in HIV and related research fields, and promotes the greater and meaningful inclusion of people living with HIV in research.

## SS76

### A PREVALENCE STUDY OF CHILDHOOD TRAUMA (SEXUAL AND/OR PHYSICAL ABUSE) AMONG HIV POSITIVE WOMEN ADMITTED TO THE HIV SERVICE AT ST. PAUL'S HOSPITAL

McCall, Jane; Kille, Julie; Lauridsen-Hoegh, Patricia; Unger, Dave  
Vancouver, BC

**BACKGROUND:** There is a growing body of empirical evidence that shows extremely high rates of childhood sexual and physical abuse among HIV positive adults. For women, the situation is particularly dire. Women are disproportionately affected by trauma and post traumatic stress disorder (PTSD). Research reveals that the rate of PTSD among HIV infected women is 30%, which is five times higher than the general female population. Rates of childhood sexual abuse are 39.35%, which is double that of the general population.

**METHOD:** A total of 42 female patients with HIV on an inpatient unit have been asked to complete the Binghamton Childhood Sexual Abuse Survey as well as a demographic tool that looked at a number of variables including housing, drug and alcohol use, history of sex trade work, CD4 and viral load. The expected sample is 50.

**RESULTS:** An overwhelming majority of the women who have participated so far have screened positive for childhood sexual abuse and had a history of illicit drug use. Research is ongoing at this time although we anticipate a complete sample of 50 within the month. It appears that childhood sexual abuse is significantly associated with illicit drug use and non-adherence. Will need final results to confirm.

## SS77

### "IT IS AN EYE-OPENER THAT THERE'S A RELATIONSHIP BETWEEN REHAB AND HIV": PERSPECTIVES OF PTS AND OTS IN KENYA AND ZAMBIA

Nixon, Stephanie<sup>1</sup>; Cameron, Cathy<sup>1</sup>; Mweshi, Margaret<sup>2</sup>;  
Nkandu, Esther M<sup>2</sup>; Okidi, Carilus<sup>3</sup>; Tattle, Stephen<sup>1</sup>;  
Yates, Tammy<sup>1</sup>

<sup>1</sup>Toronto, ON; <sup>2</sup>Lusaka, Zambia; <sup>3</sup>Opapo, Kenya

**OBJECTIVE:** To explore the perspectives of rehabilitation providers (PTs and OTs) in Nyanza Province, Kenya, and Lusaka, Zambia, regarding their role in the care of people living with HIV (PHAs).

**RATIONALE:** HIV prevalence is greater than 20% in both Nyanza Province and Lusaka. ART access is growing in these settings, resulting in many people living longer with HIV and the resulting comorbidities and disablement. Therefore, the need is great for HIV training across the health care continuum, including rehabilitation.

**METHODS:** Pilot testing was conducted to assess an HIV teaching tool for rehabilitation providers in Sub-Saharan Africa in October-November, 2014. The tool was adapted from the Canadian "E-Module on Evidence-Informed HIV Rehabilitation" developed by CWGHR. Pilot testing was conducted in Kenya (n=32, 21 PT/11 OT) and Zambia (n=31, all PT) and included a demographic questionnaire, a survey on knowledge of HIV and rehabilitation, and focus groups (5 in Kenya, 5 in Zambia) to discuss the teaching tool. We present an interpretive analysis of focus group data regarding participants' perspectives on rehabilitation for PHAs. Ethics approval was received from University of Toronto, University of Zambia, and KEMRI (Kenya).

**RESULTS:** This was the first exposure to the role of rehabilitation with PHAs for many participants, despite the high local HIV prevalence. Participants described rehabilitation as largely excluded from HIV trainings, policy meetings, and care (except end-of-life). They emphasized that rehabilitation will require engagement of community-based, non-professional providers. Participants noted that their new insights regarding HIV also broadened their perspectives on rehabilitation for other conditions.

**DISCUSSION:** Formal HIV policies (e.g., national strategic plans) in Sub-Saharan Africa now frequently recognize disability within the HIV continuum, yet rehabilitation providers remain marginalized if not excluded from the HIV response in many settings. Incorporating HIV training into undergraduate and continuing rehabilitation education is a crucial next step for the HIV response in Africa.

## SS80

### TREATMENT ACCESS MAP

Santoso, Barbara

Toronto, ON

**PLAIN LANGUAGE SUMMARY:** First of its kind in the country, the Treatment Access Map is a comprehensive online tool that will be available on the CTAC website. The Treatment Access Map will allow community members and service providers to interactively access information on:

- Publicly funded provincial and territorial HIV and hepatitis C treatment information, including formularies, dates, prices, and treatment eligibility criteria
- Treatments covered under the six federal public drug plans
- Treatments currently under development
- Cross-provincial list of relocation-related legislation and processes linked to treatment access
- Links to tools for access specific barriers
- Links to individual and community resources to ease transition when moving between provinces
- "Take Action" section with proposed recommendations of what could be done at different systemic levels to improve access to treatment

**RESULTS:** Access to treatment is critical for the best possible health outcomes of people living with HIV and/or hepatitis C in Canada. Currently, a map of Canada demonstrating available HIV and hepatitis C treatments per province/territory and cross-provincial list of relocation-related legislation and processes linked to treatment access does not exist.

**CONCLUSIONS:** The Treatment Access Map will empower people living with HIV and hepatitis C by equipping them with information, resources and tools in order to better navigate structural barriers, as well as clearly identify national and provincial and territorial barriers (and non-barriers) which in turn would stimulate national discussion on treatment access issues.

## SS81

### A NOVEL INSTRUMENT TO ASSESS CAPACITY TO CONSENT FOR HEALTHCARE AMONG INDIVIDUALS WITH PROBLEMATIC SUBSTANCE USE AND WHO ARE HOMELESS OR UNSTABLY HOUSED

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Patterson, Michelle<sup>3</sup>; Mâsse, Louise C<sup>1</sup>; Ho, Anita<sup>1</sup>; Ogilvie, Gina<sup>1</sup>;  
Buxton, Jane<sup>1</sup>

<sup>1</sup>Vancouver, BC; <sup>2</sup>Hamilton, ON; <sup>3</sup>Burnaby, BC

**INTRODUCTION:** Individuals who misuse substances and who are homeless (IMSH) are at higher risk of acquiring HIV, sexually transmitted infections and bloodborne infections and have greater medical needs than the general population; however, providing healthcare with

informed consent is challenging as many IMSH have impaired cognition due to substance use. A Capacity Assessment Instrument for People who misuse Substances (CAIPS) has been developed to assist clinicians in deciding if clients lack capacity to consent to healthcare (CTC-HC).

**METHODS:** Eleven items were identified by examining existing capacity assessment instruments and by interviewing nurses who deliver services to IMSH. A panel of experts assessed the items for construct and content validity and the items were revised as needed. A validation study was conducted that compared the CAIPS instrument to two gold standards: 1) a clinical assessment by a psychiatrist and 2) assessment with the MacArthur Assessment Tool for Treatment (MacCAT-T). Reliability was examined by calculating a Chronbach's alpha. A confirmatory factor analysis was conducted to determine dimensionality. Sensitivity and specificity were determined using the composite CAIPS score compared to each gold standard.

**RESULTS:** The final instrument consists of items that address understanding, voluntariness, orientation, ability to communicate, sustained attention, distorted reality, appreciation, reasoning, expression of choice, decision making demands, and physical indication of substance use. A total of 302 individuals (182 [60.3%] male; 124 [41.1%] Caucasian) participated in the validation phase. The CAIPS instrument demonstrated good internal reliability (Cronbach's alpha: 0.861 – 0.893) and inter-observer reliability (weighted kappa statistic of 0.657). Unidimensionality was confirmed. Sensitivity was 0.75 – 0.81 and a specificity was 0.63 – 0.51.

**CONCLUSION:** The CAIPS instrument is a reliable instrument with moderate validity and is the first validated capacity assessment instrument available to assess CTC-HC among IMSH. We hope that this new instrument will enable nurses to make informed decisions surrounding the capacity of their clients and, in turn, will result in increased health equity for IMSH. Future research is required to validate the instrument with other healthcare professionals.

## SS83

### CULTURE, STIGMA, AND AGENCY: TELLING AND RE-TELLING THE STORIES ABOUT HIV/AIDS

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<sup>1</sup>Hamilton; <sup>2</sup>Brampton, ON

The tradition of storytelling not only reflects a distinct cognitive framework; it also represents a fluid and open knowledge system in which storytellers as well as their audience can actively participate. In the context of HIV/AIDS, storytelling has been used as culturally viable and effective strategies to both manage HIV-related stigma and carry out HIV education, especially in non-western societies (e.g., Galavotti, 2005; Tafoya, 2000; Zeelen et al., 2010). Using a narrative approach, this paper examines the contents, storylines, perspectives, and meanings of some stories about HIV/AIDS selected from a CIHR-funded qualitative study of HIV risk faced by Indian immigrants in Canada.

Many participants in this study told stories – stories of other people whom they personally know or heard of – about this disease in response to our interview questions about their own knowledge about HIV/AIDS. Despite the diversity of the storylines, their stories represent some common understanding of this disease, such as perceived “risk groups” (e.g., drug drivers), transmission routes (e.g., extramarital heterosexual sex) and consequences (e.g., discrimination, further transmission, and death). While such understanding illustrates the overarching influence of the cultural notions of marriage, family, and morality on their story constructions, several specific gender dimensions are also identified. For some women, for instance, storytelling also played a role in giving voice to their silenced concerns about their spouses' infidelity and related health risks, both of which they perceived to have little control over.

We contend that storytelling enabled these participants to somewhat transcend the heavy stigma associated with HIV/AIDS and thus to speak about some culturally taboo topics (e.g., sex and HIV/AIDS) that are otherwise unspeakable in the community. The disjuncture between their stories and sound HIV knowledge also suggests the urgent need for the development of culturally comprehensible and gender-sensitive approaches to HIV prevention for this community, however.

## Community Practice Research

### Recherche en pratique communautaire

#### CPR01

#### ASSOCIATION BETWEEN FOOD INSECURITY AND FOOD PROCUREMENT METHODS AMONG PEOPLE LIVING WITH HIV/AIDS IN BRITISH COLUMBIA

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<sup>1</sup>Vancouver, BC; <sup>2</sup>Montreal, QC; <sup>3</sup>Toronto, ON

**BACKGROUND:** Studies suggest that people living with HIV/AIDS in high-income settings suffer high levels of food insecurity. However, limited evidence exists regarding the dietary intake of this population and sub-components driving food insecurity (i.e. food quantity, quality, safety or procurement). We therefore examined the prevalence and characteristics of food insecurity among HIV-positive people across British Columbia (BC), Canada.

**METHODS:** This analysis was conducted within a national community-based research initiative involving 30 AIDS service organizations and four universities across Canada. Peer research associates led participant recruitment and survey / dietary recall administration. Food security was measured using the Health Canada Household Food Security Scale Module. Logistic regression was used to determine key factors associated with food insecurity, controlling for potential confounders.

**RESULTS:** Of 262 participants deemed eligible for analysis, 192 (73%) reported being food insecure. Sub-components associated with food insecurity in bivariate analysis included below daily recommended intake consumption of protein ( $p = 0.046$ ); being sick from spoiled/unsafe food in the past six months ( $p=0.010$ ); and using non-traditional means of food procurement ( $p<0.05$ ). In multivariable analyses, factors significantly associated with food security included: procurement of food in using non-traditional means of food procurement [adjusted odds ratio (AOR)=11.11, 95% confidence interval (CI): 4.79-25.68,  $p<0.001$ ]; younger age [AOR=0.92, 95% CI: 0.86-0.96,  $p<0.001$ ]; unstable housing [AOR=4.46, 95% CI: 1.15-17.36,  $p=0.031$ ]; household gross annual income [AOR=4.49, 95% CI: 1.74-11.60,  $p=0.002$ ]; and symptoms of depression [AOR=2.73, 95% CI: 1.25-5.96,  $p=0.012$ ].

**CONCLUSION:** Food insecurity among people living with HIV in BC appears to be defined by poor dietary diversity and food procurement methods. Notably, participants who reported using non-traditional means of food procurement were over 10 times more likely to be food insecure. These findings suggest a need for tailored food security and social support interventions in this setting.

#### CPR02

#### CHALLENGES, ISSUES AND GAPS IN PROVIDING MENTAL HEALTH SERVICES AND COUNSELLING TO SPANISH-SPEAKING PEOPLES (CSSP)

Bilbao-Joseph, Celeste

Toronto, ON

**PLAIN LANGUAGE SUMMARY:** Empirical research has pointed out the relationship of mental health issues, adequate access to cultural sensitive services and HIV Prevention. On the ground, providing a marginalized community such as Spanish-speaking MSM with one-on-one counselling services can be challenging due to lack of adequate number of staff.

**ISSUES:** In 7 years I have provided counselling related to homophobia, lack of support, family rejection, underemployment/unemployment, trauma, violence, immigration issues, difficulties in understanding self sexual desires, sexual orientation, and how to deal in a Spanish-speaking marginalized environment in Toronto.

**DESCRIPTION:**

- An innovating strategy of working off traditional hours from 9-5 was developed along with Skype and new technologies for hard to reach



clients, allowing people who work on that schedule, having flexibility for accessing counselling.

- Due to the diversity of issues that CSSP HIV/AIDS's clients have, the role of the Counsellor has to be more flexible since clients need proper case managing and proper social work diligence.
- Having an independent program's office that is conveniently located and away from the other services that CSSP provides, helps to keep clients' confidentiality and reduces stress, while promotes seeking for help.

#### RESULTS:

- Over time the program has provided counselling to over 7,000 clients.
- Some clients require a longer treatment and different and deeper Counselling approaches.
- Accessing services with referrals is also challenging for our clients due to long waiting list procedures, economic factors (too poor to access private services), and language barriers.

#### LESSONS LEARNED:

- By comparing other HIV/AIDS services that are cultural specific for other groups, CSSP's counselling services realizes the need of increasing the number of qualified staff that can take in the area of case management and social work.
- Mental Health services should be an integral part of any HIV/AIDS structural intervention effort.

### CPR03

#### THREE YEARS FOLLOW UP FOR THE "365 DAYS OF PREVENTION CALENDAR"; A NEW WAY TO ENGAGE LATINOS PHA'S AND NON-PHA'S TO INCREASE AWARENESS AND PROVIDE REAL FACTS ABOUT THE EPIDEMIC IN OUR SPECIFIC POPULATION

**Lopez Torres, Rene**  
Toronto, ON

**PLAIN LANGUAGE SUMMARY:** The epidemic and number of new HIV infections in Latino MSM has had a dramatically increase in the last 5 years.

Bringing together Latino PHA's and non-PHA's to encourage them to get more informed and transfer that knowledge into new prevention practices to peers and reduce the infection numbers went into practice with a new project.

**ISSUES:** Being and Outreach Worker providing services for Latino PHA's and non-PHA's, has been a challenge within the last 5 years. I can see guys getting infected almost every week because there's a lack of communication, information in specific language or even specific cultural approach that can help them to understand the way of how sexual health plays the big role into their life.

#### DESCRIPTION:

- We created a new graphic tool to provide information and address issues that Latino PHA's and non-PHA's were facing.
- Discrimination and stigma between participants was an unfortunate factor to get them to participate in the project, as they were concerned about to disclose to the general Latino population because of cultural/social taboos.
- 4 focus groups were facilitated to get the sense of the most important issues among the participants including the confidentiality part.

**RESULTS:** There're three "365 Days of Prevention Calendars" developed since 2010.

More than 95 Latino PHA's and non PHA's participated on the project either as advisory committee members or as a volunteer models.

Notorious learning and best sexual health practices were implemented by each of one of the participants.

There's still collaboration with Hassle Free Clinic with same and new Latino MSM clients to evaluate the success of the project.

### CPR04

#### ENGAGING ABORIGINAL COMMUNITIES AND ORGANIZATIONS IN RESEARCH: LESSONS LEARNED FROM STABLE HOMES, STRONG FAMILIES

**Amirault, Marni<sup>2</sup>; Anaquod, Jaqueline<sup>2</sup>; Brownlee, Patrick<sup>2</sup>; Greene, Saara<sup>1</sup>; Hill, Charlie<sup>2</sup>; Ion, Allyson<sup>1</sup>; Jackson, Randy<sup>1</sup>; Masching, Renee<sup>2</sup>; Nyman, Sheila<sup>2</sup>; Paul, Pam<sup>2</sup>; Stonechild, September<sup>2</sup>**

<sup>1</sup>Hamilton, ON; <sup>2</sup>Dartmouth, NS

**BACKGROUND:** Conducting research with Aboriginal communities necessitates developing positive relationships within the community long before data collection begins. This process is important to maximize leadership within communities and organizations that are critical to supporting the research process. Stable Homes, Strong Families (SHSF) demonstrates the successes and challenges of relationship building in community-based research (CBR). SHSF is a national project that aims to develop cultural understandings of housing and home amongst Aboriginal peoples living with and affected by HIV and AIDS in order to influence housing policy and programs.

**OUR APPROACH:** Relationships were developed between Aboriginal HIV service organizations, academic researchers and community leaders prior to grant submission. Following receipt of funding, a strategy to hire, train and support local Peer Research Associates (PRAs) to plan and lead digital storytelling (DS) workshops along with the research team was developed. Five workshops were held with 22 participants across Canada from June 2013 to November 2014.

**FINDINGS:** Our CBR approach highlighted a number of important lessons for working in partnership with diverse Aboriginal communities across Canada and conducting research with PRAs who also bring diverse identities and experiences. Time must be invested to develop partnerships even before the grant is finalized and submitted. PRAs should be trained and supported in all aspects of the research. Early engagement with Elders, community supports and organizations is critical to understanding the needs of participants, to creating a safe space where the research will be conducted and ensuring local Aboriginal cultural protocols are respected.

**IMPLICATIONS:** Community engagement and partnership development are as important as generating data and are essential to effective, community-driven knowledge translation activities. Lessons learned regarding key considerations for partnerships between Aboriginal communities and researchers will critically inform our analysis of data from the DS workshops.

### CPR05

#### SEXUAL BEHAVIOURS AND HIV KNOWLEDGE OF ASIAN MIGRANT FARM WORKERS (AMFWs) IN ONTARIO

**Sutdhibhasilp, Noulmook<sup>1</sup>; Cabarios, Constantine<sup>1</sup>; Tangsubutra, Romyen<sup>1</sup>; Ramsaroop, Chris<sup>1</sup>; Vankoevenden, Piyarat<sup>2</sup>; Narushima, Miya<sup>1</sup>; Poon, Maurice<sup>1</sup>; Vahabi, Mandana<sup>1</sup>; Wong, Josephine Pui-Hing<sup>1</sup>**

<sup>1</sup>Toronto; <sup>2</sup>Chatham, ON

**BACKGROUND:** In 2012-2013, Asian Community AIDS Service (ACAS) conducted a community-based research to assess and identify contributing factors to HIV vulnerability of Asian Migrant Farm Workers (AMFWs) in Ontario by exploring their HIV/AIDS knowledge and sexual behaviours, personal and structural determinants of HIV/STI vulnerabilities, and resilience factors.

**METHODS:** A Purposive Sampling was used to recruit 80 Thai and 20 Filipino MFWs to complete a written questionnaire. Twenty-four participants completing the survey component were invited to participate in one of the three follow-up focus groups to further explore the studied issues. Trained peer research assistants assisted with participants' recruitment, survey and focus group administration.

**RESULTS:** Participants' average age was 38 years with 53% male and 47% female. Overall, participants had a moderate knowledge about HIV/AIDS. 62% were sexually active in the past year and 55% of them had sex with a regular partner. Use of condoms was relatively low, with over 76% indicating they rarely or never used condoms with regular partners. 23% reported having difficulty negotiating safe-sex practices with partners. 4% were tested for HIV, 3% for STIs and 4% for both HIV and STIs. Structural issues: limited English proficiency and social support; transportation

problems; long working hours etc., contribute greatly to their inadequate use of health services.

In the focus groups, participants discussed perceived risks and fear of being infected with HIV/STIs, particularly with a casual partner. The majority assumed sexual partners from the same country were free from HIV because they passed a work visa's medical screening prior arriving Canada. Condom use is mainly for preventing pregnancy. All considered sexual health issues were private and did not necessary discuss the matters with co-workers.

**CONCLUSIONS:** Access to culturally and linguistically appropriate health, HIV, and labour rights, and how to use health and sexual health services information would increase their overall health and well being. AMFWs also recommended such activities as having a sexual health discussion among peers and an annual physical check up for all workers.

## **CPR06**

### **ACCESS, IDENTITY AND MEN: A STUDY EXPLORING SEXUAL HEALTH AMONG SOUTH ASIAN MSM**

**Sharvendiran, Ramraj; Hart, Trevor; Chikermane, Vijaya**  
**Toronto, ON**

**BACKGROUND:** Given the significant gap in knowledge surrounding sexual behaviour patterns among South Asian MSM populations in Canada, ASAAP's Gay men's program initiated a Community-Based Research titled AIM (Access, Identity and Men), supported by a strong, community driven research team and funded by the Ontario HIV Treatment Network (OHTN). The AIM Study has generated critical data on risk factors, health access and support practices among South Asian MSM that meaningfully informs the development of HIV prevention and sexual health programming.

**METHODS:** Qualitative and quantitative tools we employed as part of a mixed method approach of data collection. 39 South Asian MSM across the Greater Toronto Area (GTA) participated in seven (7) focus groups and two (2) one-on-one interviews where they completed surveys tracking demographic information and personal sexual behavior patterns. Participants also engaged in recorded group discussion broadly categorized within three major themes: identity, access/barriers, and risk/support which were identified by the community-led research and advisory team. Recorded sessions were transcribed and coded by the research and community advisory groups for analysis.

**FINDINGS:** The 39 participants represented a highly diverse sample covering various religions, languages, socio-economic status, migratory experiences, HIV status and age. Coding of the qualitative data revealed the following key themes or findings were integral to how men viewed their sexual health within an intersectional framework:

- Isolation and loneliness
- Shame
- Mental Health
- Violence
- Risk and Disclosure
- Race
- Stigma and Homophobia
- Religion
- Family and Cultural Community
- Marriage

**IMPLICATIONS:** Findings will significantly support South Asian ethno-racial organizations as well as mainstream agencies who are looking to strengthen services to both queer communities and South Asian populations respectively. Further implications include the potential for more focused areas of study and intervention models. Impacts of knowledge translation on participants and the broad MSM community isolated from each other's experiences are also significant.

## **CPR07**

### **HIV PERCEPTION AND RISKS FOR A LOW-INCOME COMMUNITY: AN IMPACT ASSESSMENT OF COMMUNITY-BASED HIV MESSAGING**

**Meili, Ryan; Calvez, Stryker S**  
**Saskatoon, SK**

In order to effectively assess prevention and treatment of a communicable disease, we need to understand the perceptions that community members hold about that illness. Saskatchewan has had an disproportionately high

incidence HIV rate for the last ten years, which the health sector has reduced from more than three times higher than the national average to two times higher (i.e., 16.2/100,000 vs. 5.9/100,000 nationally; SK Ministry of Health, 2012). In Saskatoon, which provides health support to northern SK communities, the incidence rate is slightly higher (i.e., 17.0/100,000) and accounts for more than 40% of new diagnoses (compared to Regina at 24% and Prince Albert at 12%; SHR, 2014). One could question the effectiveness of local HIV primary prevention practices and interventions methods, but many barriers contributed to the local HIV epidemic (e.g. limited access/engagement, service deficiencies, discrimination; Lang et al., 2013a). Community organizations have struggled to provide support, with HIV education as the minimum level of intervention. Health education is a common prevention strategy, which relies on the hypothesis that the right knowledge will lead individuals to make rationale choices to reduce risk (Younge et al., 2010). However, research with Saskatoon's low-income communities most at risk for HIV has found that many of these community members possess atypical beliefs about health. This helps explain the low engagement in health behaviours, higher risk taking, and poorer health outcomes (Lang et al., 2013b). Given the health education hypothesis and the high HIV incidence rates found in these communities, one could deduce that these community members possess low factual knowledge about HIV. Working with community organizations to examine the impact of their organizational HIV intervention messaging, our study indicated that community members possess a relatively accurate knowledge of HIV. These results and the impact for HIV programming for low-income communities will be discussed.

## **CPR09**

### **MOVING MOUNTAINS TO ADDRESS HIV/AIDS IN NORTHERN BC THROUGH COMMUNITY BASED RESEARCH**

**Daniels, Tiegan<sup>1</sup>; Reschny, Jamie A<sup>2</sup>; Langlois, Andrea<sup>1</sup>; Duddy, Janice<sup>1</sup>**

**<sup>1</sup>Vancouver; <sup>2</sup>Prince George, BC**

Northern British Columbia is a region that comprises more than half the province – at approximately 500,000 km sq, it is twice the size of the United Kingdom. The Northern Health Authority (NHA), the northernmost regional health authority in BC, is tasked with providing healthcare services, including HIV prevention, treatment and care to 285,300 residents, dispersed in a range of urban centres, rural areas, and in some instances very remote locations. The challenges associated with healthcare delivery within such an expansive and diverse geographic area are multiple, including, for example, travel distances and costs and the limited number of healthcare professionals working on HIV/AIDS in BC's North.

The purpose of this presentation is to share some of the key findings of the Moving Mountains project. The Moving Mountains HIV/AIDS Community Based Research (CBR) Conference held in Prince George, BC, in June, 2014, was born out of a desire to bring people together to review HIV/AIDS research underway, build the capacity to participate in CBR, and to identify gaps in information and priorities for future research – all with the goal of strengthening the regional response to HIV/AIDS.

The conference participants identified three intersecting priorities: (1) the impact of the natural resource development industries on the regional HIV/AIDS epidemic; and, (2) methods to reduce stigma and discrimination; (3) and improve HIV prevention, treatment and care.

Following the release of a community report and using the substantial interest generated by the event, the core research group sent an open call to participants of the conference to become part of a Research Working Group (RWG). This RWG has since convened with the purpose to further develop a research project(s) based on one or more of the identified research priority themes, and to design, develop and submit a grant application or applications to continue this work.

**CPR10****SEX WORKERS SPEAK OUT ON HOUSING, SAFETY & SEXUAL RISK REDUCTION: RECOMMENDATIONS FROM A COMMUNITY-BASED RESEARCH STUDY****Dilley, Laura; Murphy, Alka; Hernandez, Andrea**  
**Vancouver, BC**

**BACKGROUND:** Sex Workers encounter social-structural barriers to accessing affordable housing (e.g., stigma, legal concerns), which compromise their capacity to negotiate safety when exchanging sex and enact sexual risk reduction. Meanwhile, social housing programs often perpetuate similar risks by requiring compliance with policies (e.g., curfews, guest policies) that undermine access to environmental supports, including indoor environments in which to exchange sex. Improvements to housing policies and interventions for sex workers are urgently needed. To this end, we undertook this community-based study to generate housing recommendations aligned with the lived experiences of sex workers.

**METHODS:** We conducted a focus group with twenty-five sex workers using a modified World Café approach, focusing on the development of housing recommendations. Participants were recruited from among the membership of a peer-driven sex worker organization operating in Vancouver, BC. Recommendations were documented by the focus group facilitator, and other team members recorded field notes documenting the focus group discussion.

**FINDINGS:** Participants underscored the need for increased availability of safe and affordable housing, and housing policies and interventions accounting for the lived experiences of sex workers. Participant emphasized the urgent need to: (1) reorient social housing policies to facilitate low-threshold access to housing (e.g., removing curfews) and indoor sex work environments (e.g., changing guest policies); (2) promote cultural safety within social housing for sex workers, including the adoption of peer-driven and cooperative housing models; and, (3) provide housing as part of integrated and peer-driven service delivery models that include comprehensive environmental supports (e.g., safer sex work spaces). Participants emphasized how the implementation of these recommendations would likely foster conditions that promote safety, sexual risk reduction, and well-being.

**CONCLUSION:** In addition to highlighting the urgent need for increased investment in affordable housing, this study demonstrates the need to align social housing models with the lived experience of sex workers in order to promote safety and sexual risk reduction.

**CPR11****BUILDING A COMMUNITY-BASED HIV/HCV SHARED MEASUREMENT SYSTEM: SUCCESSSES AND LESSONS LEARNED FROM THE COMMUNITY HIV/HCV EVALUATION AND REPORTING TOOL (CHERT) IN BRITISH COLUMBIA****Duddy, Janice; Vlahaki, Elayne**  
**Vancouver, BC**

Shared measurement systems require all programs or initiatives operating within a field to report on the same measures, using identical indicators and methodologies (Kramer, Vaidyanathan, & Parkhurst, 2009). Such systems have the potential to increase efficiency, learning and impact within any given field by accurately documenting the work that is collectively being conducted.

Led by the Pacific AIDS Network (PAN) – a network of over 50 community-based member organizations in British Columbia – and funded by the Provincial Health Services Authority, the Community HIV/HCV Evaluation and Reporting Tool (CHERT) is an online survey that collects annual data from community-based HIV/AIDS and/or Hepatitis C (HCV) organizations operating in BC. CHERT questions explore both process and outcome level indicators related to the programs' prevention, testing, treatment and support services. One of the central objectives of the CHERT is to demonstrate the collective contribution community programs are making to the success of the provincial HIV/AIDS strategy. This presentation will explore the successes, challenges and lessons learned from the process of establishing this shared measurement system in BC. The CHERT has had many successes, for example to-date the CHERT has collected three years of data, with approximately 70% of PAN member organizations participating each year. This allows the sector to monitor performance and to track progress towards common goals.

But there have also been some challenges and lessons learned. For instance, while CHERT respondents have a shared vision for change their approaches and structures are different, which makes the establishment of shared measures (i.e. indicators) challenging. It is also challenging to integrate different perspectives and needs into this type of tool – i.e. a community-based organization vs. a funding body such as a health authority. *References: Kramer, Vaidyanathan, & Parkhurst. (2009). Breakthroughs in shared measurement and social impact. Retrieved from: [http://www.fsg.org/Portals/0/Uploads/Documents/PDF/Breakthroughs\\_in\\_Shared\\_Measurement\\_complete.pdf](http://www.fsg.org/Portals/0/Uploads/Documents/PDF/Breakthroughs_in_Shared_Measurement_complete.pdf)*

**CPR12****HEPATITIS C OUTREACH, EDUCATION AND MEDIA FOR ETHNORACIAL COMMUNITIES IN ONTARIO****Tuscano, Hywel J; Jackson, Ed; Tanveer, Fozia; Pollock, Jim; Rice, Jeff**  
**Toronto, ON**

**BACKGROUND:** From 2011-2014 CATIE developed an Ethnocultural Hepatitis C Outreach project that produced in-language hepatitis C resources and a media campaign for four major immigrant communities living in Ontario: Pakistani, Punjabi, Chinese and Filipino.

**PURPOSE:** Of all the hepatitis C infections reported in Canada, 35 per cent are estimated to be among immigrants (PHAC, 2014). Immigrants also face cultural and linguistic barriers to healthcare, and in Canada immigrant health is shown to decline over time. In-language resources and community development are required to engage these communities in health issues.

**METHOD:** The project was developed through partnership and community consultation including community advisory councils. The project implemented a multi-level strategy including education, outreach and social marketing. The education component included facilitator training, a multilingual website, in-language workshops and brochures. Educational tools developed include puzzles, case studies and curriculum. The outreach component included community partnerships and event outreach. The social marketing component included a media campaign across four communities, in print, radio and online. Evaluation activities included collecting key performance indicators (to measure the type and quantity of work performed) and in-person evaluation forms for workshops.

**RESULT(S):**

Education: yourlanguage.hepcinfo.ca has hepatitis C information in 9 languages and receives over 1000 visits monthly. Between 2012-2014 43 in-language workshops reached 877 people. Multilingual brochures are available in 6 languages and 16621 have been distributed.

Outreach: The project has partnered with 20 organizations. Event outreach each year reaches over 2000 people.

Social Marketing: Three waves of a hepatitis C awareness campaign have run in up to 26 ethnocultural print, radio and online outlets. Editorial content was also produced including articles, radio interviews and tv programs.

**CONCLUSION(S):** Meaningful partnership, community engagement and a strong interest to raise awareness of hepatitis C within immigrant communities facilitated the project's success and reach.

*Funder: The Hepatitis C Secretariat, AIDS Bureau, Ontario Ministry of Health and Long Term Care.*

**CPR13****HEPATITIS C INFORMATION NEEDS OF PATIENTS IN CARE IN CANADA****Challacombe, Laurel A; Jackson, Ed; Plant, Barry; Rogers, Tim; Anderson, Scot**  
**Toronto, ON**

**BACKGROUND:** An estimated 332,414 people in Canada are anti-HCV positive, some people will/ have cleared the infection while others will go onto chronic infection. Without treatment, chronic infection can lead to severe liver damage, liver cancer and liver failure. There is a lack of Canadian data on the information needs of people living with hepatitis C in order to help them manage their health.

**PURPOSE:** CATIE developed a national needs assessment of patients engaged in hepatitis C care to inform the development of educational resources and services.



**OBJECTIVES:** Through this national needs assessment we will learn about the types of information people with hepatitis C need and how they would like to receive it.

**METHODS:** Twenty medical clinics across Canada serving people living with hepatitis C have been approached to request their help in recruiting people with hepatitis C who are receiving care to complete an online needs assessment. The needs assessment is available in both English and French through Fluid Survey. To date, eight clinics have agreed and 226 participants have been recruited. The aim is to recruit 250 participants by February 2015.

**RESULTS:** An analysis will be presented that includes information on demographics (age, gender, family background/place or origin) health and care (year of diagnosis, discussion of hepatitis C treatment options with physician; current hepatitis C treatment experience, involvement in decision making around hepatitis C care), knowledge needs (rating of current knowledge of hepatitis C, rating of need for hepatitis C information, importance of certain topic areas for hepatitis C information), and preferred formats to receive information on hepatitis C.

**CONCLUSIONS:** The information will be shared broadly through various knowledge exchange mechanisms in order to help strengthen programming for people with hepatitis C. The information will also be used to inform CATIE's work in hepatitis C.

## **CPR14**

### **USING KNOWLEDGE EXCHANGE TO STRENGTHEN HIV AND HEPATITIS C PROGRAMMING IN CANADA**

**Challacombe, Laurel A; Rogers, Tim; Edmiston, Laurie**  
**Toronto, ON**

**BACKGROUND:** CATIE champions and supports innovation and excellence in knowledge exchange (KE) by collaborating with and building the capacity of front line organizations to use knowledge effectively to respond to HIV and hepatitis C. CATIE uses a variety of KE activities to strengthen the frontline response which are tailored according to the target audience, the content of the knowledge and the purpose of the knowledge for the target audience. Many of these approaches have been evaluated and provide important information and insight regarding effective KE strategies

**METHODS:** Various approaches to evaluation of KE activities included online surveys and in-person evaluation forms. Standard evaluation indicators were used to assess key knowledge exchange outcomes, including relevance, usefulness, increased knowledge, and application of knowledge.

**RESULTS:** The evaluation results of five different methods of knowledge exchange were analyzed and compared. These methods were: 1) a deliberative dialogue on policy and programming implications of emerging biomedical research; 2) an online bulletin highlighting new prevention research and demonstrating how research findings can be integrated into frontline programming; 3) learning institutes that support frontline workers to learn from research conferences and share findings with their communities; 4) a health magazine written by and for people living with HIV and 5) a website providing comprehensive information on HIV and hepatitis C.

Based on the participant/user evaluations, these methods of knowledge exchange were relevant (96% to 100%) and useful (87% to 100%). They resulted in increased knowledge (94% to 98%) that was applied to the frontline response (94% to 100%). The evaluations also provided insight into the factors that contribute to successful knowledge exchange.

**CONCLUSIONS:** KE methods that are tailored to the audience, content and purpose for KE, can strengthen the frontline response to HIV and hepatitis C.

## **CPR15**

### **IMPLEMENTATION AND EVALUATION OF A MULTI-METHOD KNOWLEDGE EXCHANGE INITIATIVE TO IMPROVE THE UPTAKE OF BIOMEDICAL RESEARCH INTO THE FRONTLINE RESPONSE TO HIV IN CANADA**

**Challacombe, Laurel A; Rogers, Tim; Edmiston, Laurie**  
**Toronto, ON**

**PURPOSE:** Emerging biomedical and programming research has the potential to significantly strengthen the HIV response in Canada. This research includes: the health and prevention benefits of treatment, PrEP, new testing technologies and the HIV treatment cascade. Since 2010,

CATIE has implemented a series of knowledge exchange (KE) activities under the rubric of program science to improve the uptake of this research into the frontline HIV response in Canada.

**METHODS:** The KE activities involved different approaches working together to catalyze program development. They involved: 1) engagement of leaders who represent a range of stakeholders; 2) building on existing promising practices and regional strengths; and 3) engagement with over 100 organizations across Canada.

**RESULTS:** The activities can be categorized into four KE objectives to strengthen programming.

Objective 1: Increase knowledge of new developments in HIV research (biomedical and program research). Activities included plain language summaries of emerging research, workshops and webinars.

Objective 2: Increase knowledge of the implementation and adaptation of new programs that are informed by program science. Activities included an online collection of program case studies and partnered interactive workshops and training.

Objective 3: Increase knowledge, networking and dialogue about new regional directions in programming. Activities included a national deliberative dialogue on integrated approaches to programming and national KE forums to share promising, evidence-informed models of prevention and treatment service integration and program collaboration.

Objective 4: Increase capacity of frontline workers to use new evidence-based approaches. Activities included support for the development and dissemination of evidence-based practice guidelines and other programming resources and tools.

Formal evaluations provided evidence of increased knowledge, increased use of new knowledge, and changes in programming and practice as a result of new knowledge.

**CONCLUSIONS:** A multi-method approach to KE can result in improved uptake and use of biomedical research by people working in HIV.

## **CPR16**

### **MOVING KNOWLEDGE INTO ACTION – EVALUATING THE SERVICES AND RESOURCES OF CATIE, A NATIONAL KNOWLEDGE BROKER**

**Challacombe, Laurel A; Rogers, Tim; Edmiston, Laurie**  
**Toronto, ON**

**BACKGROUND:** CATIE champions and supports innovation and excellence in HIV knowledge exchange by collaborating with and building the capacity of front line organizations to use knowledge effectively to respond to the HIV epidemic; supporting and connecting people with HIV, other individuals, and organizations to develop, synthesize, share and apply HIV knowledge; and acting as a central contact point for the flow of comprehensive, accurate, unbiased, timely and accessible HIV information and community-based knowledge.

**METHODS:** In 2014, a national survey of frontline workers was conducted to assess the impact of CATIE's complement of programs and services. Frequency descriptives from the 369 front-line workers who responded to the survey have been compiled.

**RESULTS:** Based on the responses, CATIE is doing a good job at reaching its intended audiences. Respondents came from the diverse array of frontline organizations working in HIV, hepatitis C and sexually transmitted infections (STIs) – most of whom (>83%) work from an integrated STBBI approach. Collectively, these organizations provide a full range of HIV and HCV services; target a diversity of populations; and provide services across Canada.

The information provided by CATIE is useful to frontline workers (95%) and their clients (91%). The diverse channels used by CATIE for information dissemination (web, print, email, in-person) were all highly rated, indicating the strength of CATIE's model for accessible knowledge exchange. CATIE's work is having a significant impact on the national response to HIV and hepatitis C. CATIE has been successful at building frontline workers' knowledge of HIV (96%) and hepatitis C (97%). Frontline workers report they can use this knowledge in their work (97%). Almost all respondents (94%) reported using information from CATIE to educate or inform others. In addition, 76% of frontline workers had used information from CATIE to change work practices and/or to change programming.

**CONCLUSIONS:** According to front line workers, CATIE's services and resources are effective vehicles for knowledge exchange.

**CPR17****HIV POINT-OF-CARE-TESTING: RESULTS OF A NOVA SCOTIA-BASED PILOT PROJECT**

**Gahagan, Jacqueline; Hatchette, Todd; Proctor-Simms, Michelle; Sharma, Sowmya; Atkinson, Jacqueline; MacIsaac, Cindy**  
Halifax, NS

**BACKGROUND:** Despite decades of HIV prevention efforts, new infections continue in Canada. Access to and ease of uptake of HIV testing remains an important element in both HIV prevention and treatment. As it currently stands, HIV testing in Nova Scotia requires access to a health care provider for a testing requisition or accessing 1 of 2 anonymous HIV testing sites in the province. Although HIV point-of-care-testing (HIV POCT) was first introduced in Canada in 2000, and now available in most jurisdictions, it is not available in Nova Scotia.

**METHODS:** This 8-month pilot project sought to determine both the acceptability and uptake of rapid HIV point-of-care testing (POCT) among a sample of hard-to-access populations in Halifax who may be insecurely housed, street-involved, currently using injection drugs, or involved in methadone maintenance therapy. Four currently established mobile (n=2) and fixed (n=2) outreach services in Halifax were used to offer HIV POCT in partnership with a street outreach nurse.

**RESULTS:** A total of 305 individuals accessing these various outreach services were offered HIV POCT, and of these, 67 individuals accepted. The majority of those offered HIV POCT asked for HCV POCT and declined HIV POCT when told HCV POCT testing was not offered as part of the pilot project. All HIV POCT tests were found nonreactive, and were confirmed through laboratory testing.

**CONCLUSION:** The overall low uptake rate found among the participants of this HIV POCT pilot project reflects, in part, the need to continue to address the basic determinants of health and related social needs of hard-to-access populations, including the need for stable housing and access to nutritious food. As evidenced by the low uptake of stand-alone HIV POCT among this population, greater emphasis on testing innovation such as HCV/HIV multiplex POCT in both fixed and mobile outreach settings, and increased awareness of testing options is warranted.

**CPR18****GROUNDING PREVENTION PRACTICE IN THE REAL NEEDS AND INTERESTS OF RURAL AND URBAN MSM IN SIMCOE-MUSKOKA, ONTARIO**

**Lachowsky, Nathan J<sup>1</sup>; Green, Colin<sup>2</sup>; Banks, Phillip<sup>3</sup>; Fenik, Jillian<sup>2</sup>; Hammann, Mark<sup>4</sup>; Trussler, Terry<sup>1</sup>; Yorke, Jan<sup>2</sup>**  
<sup>1</sup>Vancouver, BC; <sup>2</sup>Barrie; <sup>3</sup>Mississauga; <sup>4</sup>Oshawa, ON

**INTRODUCTION:** Our community-based research study sought to investigate the needs and interests of gay, bisexual, and other men who have sex with men (MSM) in Ontario's Simcoe-Muskoka region.

**METHOD:** MSM aged 18+ were recruited via online sociosexual websites (e.g., Squirt) and in-person LGTBQ-targeted events/services from June-November 2014 to complete an anonymous 20-30 minute online questionnaire detailing their community and sexual health wellness as well as their demographics. Multivariable logistic regression (p<0.05 significant) was used to identify factors associated with particular interests, service use, and characteristics of our sample.

**RESULTS:** A total of 230 eligible participants at least partially completed the questionnaire (57.8% completion rate). Our sample was 61.0% gay-identified, 58.7% raised locally in Simcoe-Muskoka, median age 43 (range 18-82), and predominantly HIV-negative (73.1%) or unsure of their status (23.4%). Locally-raised men were less likely to travel to Toronto for sex with other men (OR=0.42, 95% CI:0.24-0.72) and HIV-positive men were more likely to travel to Toronto for care (OR=19.4, 95% CI:2.17-173.61). Interest in a coming out support group was less likely for men who didn't know their HIV status compared with those who were HIV-negative (AOR=0.26, 95% CI:0.08-0.79), but more likely for younger men (AOR=0.95, 95% CI:0.93-0.98). Younger men were also more likely to want an LGBTQ sports teams (OR=0.97, 95% CI:0.94-0.99). Men who were partnered with a woman were significantly less likely to participate in local LGTBQ-identified events (OR=0.17, 95% CI:0.06-0.47); one-quarter of these participants were out to their female partner (23.3%, n=7/30). Half of participants were out to their doctor (48.9%), which was negatively associated with being a parent (AOR=0.18, 95% CI:0.04-0.92)

and being unsure of their HIV status versus identifying as HIV-negative (AOR=0.19, 95% CI:0.07-0.50). Participants were most comfortable getting an HIV test from sexual health clinics (37.7%) or their family doctor (30.5%) although some felt most comfortable with home testing (12.0%). Men partnered with a women were less likely to have ever been tested for HIV (OR=0.41, 95% CI:0.17-0.96).

**CONCLUSION:** Community-grounded, culturally-sensitive approaches to HIV prevention, care, and support benefit from these diverse individuals' involvement.

**CPR19****THE LEARNING PLACE IN COMMUNITY BASED RESEARCH IN HIV/AIDS: ORGANIZING A NATIONAL PRIMER FOR TRAINING CBR TEAMS**

**Ibanez-Carrasco, Francisco<sup>1</sup>; Watson, James<sup>1</sup>; Harris, Mitch<sup>1</sup>; Hatzipantelis, Maria<sup>1</sup>; Rourke, Sean<sup>1</sup>; Matejcic, Andrew<sup>2</sup>; Dos Santos, Suzete<sup>2</sup>**

<sup>1</sup>Toronto; <sup>2</sup>Ottawa, ON

**BACKGROUND:** The training of community based research (CBR) teams from the ground up including the GIPA based participation of people living with HIV is done piecemeal in Canada. Current literature on peer training evidences a lack of consensus on what a HIV CBR curriculum should include, what the goals are and how learning can be evaluated. To meet this need, a partnership was formed in 2011 between the Ontario HIV Treatment Network (OHTN), the Canadian Association for HIV Research (CAHR) and the Canadian Institutes of Health Research (CIHR) to create The Learning Place for Community Based Research in HIV/AIDS (TLP - <http://tlp.ohtn.on.ca>) with partial Public Health Agency of Canada funding. Its centrepiece is an instructional multimedia website that promotes blended learning for all CBR practitioners. Additionally, TLP hosts frequent educational events for peer research associates (PRAs).

**METHODS:** We use a) qualitative reports of the application of the Modules contained in TLP and the effectiveness of its educational approach, b) aggregates of individual Module use, and c) audited the process of forming the TLP partnership and of incorporating the academic, policy and community perspectives into the learning components of TLP.

**RESULTS:** Since 2011, over 50 collaborators across HIV research sectors and disciplines contributed with over 100 hours of work toward building the TLP curriculum. 10 CBR teams provided positive qualitative and quantitative reports of having integrated TLP materials into their team training; the online TLP Modules were used 70 times in the 2014 period; and over 100 persons attended the events sponsored by TLP (e.g. online program "What's Hot with PRAs in Canada!"). TLP users highlight the plain language, appeal, and adaptability features of the materials.

**DISCUSSION:** Further educational research is needed to evaluate the experiential and specific content learning of all those involved in HIV CBR, especially of PRAs. Interdisciplinary collaboration and in-kind contribution from all stakeholders have been significant in designing and implementing the TLP curriculum on HIV CBR.

**CPR20****INVALUABLE LESSONS: COMPENSATING PEER RESEARCH ASSOCIATES IN HIV COMMUNITY-BASED RESEARCH IN CANADA**

**Langlois, Andrea<sup>1</sup>; Tatham, Christopher<sup>2</sup>; Carter, Allison<sup>1</sup>; Chittock, Brian<sup>1</sup>; Parashar, Surita<sup>1</sup>; Lauscher, Darren<sup>1</sup>; McDougall, Patrick<sup>1</sup>; Osborne, Charles<sup>1</sup>**

<sup>1</sup>Vancouver, BC; <sup>2</sup>Toronto, ON

**THE ISSUES:** In HIV community-based research (CBR), compensating people with lived experience to participate actively in the research process is a common practice. Peer research associates (PRAs) can take on diverse roles within CBR studies, and compensating PRAs for their time, skills, and expertise is critical; these types of payments are intended to support inclusion and the effective and equitable participation in research processes. Further, having clear compensation policies and procedures can be helpful in clarifying expectations and responsibilities relating to people's involvement. Yet, few resources exist to provide guidance on developing compensation structures.

Our CBR Approach: Based on consultation with members of the British Columbia HIV CBR Quarterly Working Group (comprised of PRAs, research coordinators, community-based organization representatives, and academics collectively involved in numerous studies) we captured tips, best practices, and guidelines to consider when developing compensation plans for PRAs. Additionally, we captured and analyzed case examples of practices implemented within existing studies and conducted a brief review of regional social assistance earning exemption policies.

**PROGRESS:** We found that developing a compensation plan with PRAs can be a complex task and many factors should be considered, such as the financial administration rules of your institution and funders and the potential impact that receiving financial compensation may have on a PRA, including their eligibility for other forms of social assistance, such as disability benefits. Findings were used to develop a “CBR Tips” knowledge translation document, which outlines important considerations to take into account when developing compensation procedures.

**LESSONS LEARNED:** “CBR Tips” is a valuable toolkit for informing compensation plans for CBR studies. Importantly though, every research project is unique, as are the financial realities of PRAs, therefore, while “CBR Tips” offers important lessons, we recommend that each study team develop their own approach to compensation in consultation with involved PRAs.

## **CPR21**

### **EXAMINING HEALTH AND HEALTH SERVICE UTILIZATION OF HETEROSEXUAL MEN WITH HIV: A SCOPING REVIEW**

**Kou, Nancy; Djioetio, Joseph N; Agha, Ayda; Tynan, Anne-Marie; Antoniou, Tony**  
Toronto, ON

**BACKGROUND:** The prevalence of HIV infection among heterosexual men has increased over the past two decades. Consequently, the need for health and support services for this group is likely to increase. The purpose of this scoping review is to provide an overview of the evidence related to the health and health service use of heterosexual men with HIV related to domains of interest identified by the community.

**METHODS:** We searched 6 databases from inception to August 2014. We included all English-language qualitative and quantitative studies examining the health and health service use of heterosexual men with HIV. Two reviewers independently screened titles and abstracts for inclusion in the review, and disagreements were settled by a third reviewer. We extracted data regarding study characteristics (i.e. country of study, design, participant demographics, comparison groups, main findings, and limitations), and used content and thematic analysis to summarize the findings.

**RESULTS:** Our search strategy yielded 2344 references, of which 87 were included in the scoping review. We summarized the research into the following domains: treatment of HIV and its complications (n=7), health and social support services utilization (n=20), social determinants of health (n=8), prevention (n=17), family planning (n=8), and psychosocial research (n=29). Key findings include difficulties accessing care, poor mental health-related well-being and self-reported functional health, over-representation among ‘late presenters’ to care, greater fear of disclosure relative to gay men, being recast as violent and monstrous by mainstream media, and a lack of support regarding family planning and fatherhood.

**CONCLUSION:** This is the first comprehensive review of the literature regarding heterosexual men with HIV. The review supports the need for multi-sector collaboration (medical, community) to develop programming and support for these patients.

## **CPR22**

### **SUPPORTING THE SUPPORTERS: DEVELOPING A NATIONAL RESEARCH AGENDA TO ADDRESS THE NEEDS OF PHAS IN SERVICE DELIVERY ROLES**

**Li, Alan T<sup>1</sup>; Peddle, Sarah<sup>1,2</sup>; Muchenje, Marvelous<sup>1</sup>; Huskins, Brian<sup>1</sup>; Harris, Gregory<sup>3</sup>**

<sup>1</sup>Toronto, ON; <sup>2</sup>Halifax, NS; <sup>3</sup>St John's, NL

**BACKGROUND:** Effective HIV treatment and the promotion of greater and meaningful involvement of people living with HIV (PHAs) (GIPA/MIPA) have facilitated increased participation of PHAs in the workforce. Unfortunately, research shows that as PHAs transition into service-provider roles, they experience loss of peer support networks,

barriers in accessing services, and increased work related stress. To address these needs, the CIHR Centre for REACH in HIV/AIDS Interventions Program of Research team organized a national think tank to engage concerned stakeholders to share strategies and co-develop a national research agenda to bridge policy and service gaps.

**METHODS:** Prior to the think tank, a literature review and program scan on interventions used to support peer engagement in service roles in HIV and related sectors were conducted. The two-day think tank included: a presentation of key concerns identified by PHA delegates; presentations of the literature review, program scans and cross country program initiatives; small group work to brainstorm key concerns, review resources and gaps, and identify key priorities for research project development.

**RESULTS/FINDINGS:** Forty-seven delegates participated in the think tank including representatives from all national AIDS organizations. Sixty percent of the delegates were PHAs in varied service provision roles. Five research priority projects were identified: (1) Develop and evaluate a third party counselling support mechanism for PHA service providers; (2) Develop and evaluate a role transition preparedness training resource; (3) Assess the impact of wise practices of informal peer support; (4) Develop a measurable framework to guide GIPA/MIPA practices; and (5) Evaluate ASO implementation of GIPA/MIPA and its resultant impact on PHAs.

**CONCLUSION/IMPLICATIONS:** The think tank facilitated the building of a national research network that has since received official working group status from the CIHR CBR Collaborative to support further stakeholder engagement to advance the identified research agenda. Lessons learned and key outcomes will be highlighted.

## **CPR23**

### **IMPROVING SEXUALLY TRANSMITTED AND BLOOD-BORNE INFECTION (STBBI) PREVENTION AND REDUCING ASSOCIATED STIGMA AND DISCRIMINATION: ANALYSIS OF ENVIRONMENTAL SCAN AND KEY INFORMANT INTERVIEW FINDINGS**

**MacLean, Rachel; Chunduri, Siri; Penney, Greg**  
Ottawa, ON

**BACKGROUND:** In April 2014, CPHA launched a project focused on increasing the capacity of health care, social service and public health professionals, and their organizations, to deliver non-stigmatizing STBBI prevention services in Canada.

#### **OBJECTIVES:**

- 1) Identify the capacity building opportunities currently available to front-line professionals, and their organizations, that increase knowledge and skills and facilitate the provision of non-stigmatizing services for persons living with or at risk of STBBIs in Canada.
- 2) Explore the ways in which stigma impacts STBBI prevention efforts in Canada and identify the promising practice approaches for the development and dissemination of capacity building opportunities.

#### **METHODS:**

- 1) Capacity building opportunities were identified through a search of the grey literature, a scan of the websites of health and social service agencies in Canada as well as the websites of relevant professional associations, and based on suggestions from key informants.
- 2) Twenty semi-structured telephone interviews were conducted with professionals working in sexual health, STBBI prevention and/or harm reduction.

#### **FINDINGS:**

- 1) Over 100 capacity building opportunities were retrieved and several gaps were identified, including limited opportunities in rural areas and limited opportunities with explicit focus on stigma.
- 2) Key informants discussed perceived and enacted stigma, as well as the structural drivers of stigma as problematic to STBBI prevention efforts. With respect to the development and dissemination of capacity building opportunities, several best practices were identified (e.g., self-reflection, inclusion of individuals with lived experience).

**CONCLUSIONS:** The key informant interviews and the environmental scan identified several gaps as well as several promising opportunities. Capacity building opportunities that facilitate self-reflection and that also address the structural drivers of stigma are needed. The findings will be used to inform the development and dissemination of capacity building



opportunities that are responsive to front-line providers' needs and that challenge the drivers of STBBI-related stigma.

## CPR24

### THROUGH MY EYES: MY OWN REFLECTIONS ON THE JOURNEY FROM BEING AN HIV POSITIVE DISABLED INDIVIDUAL TO BECOMING A PEER RESEARCH ASSOCIATE

Von Bischoffshausen, Otto; Safford, Heidi; Kesselring, Sarah; Carter, Allison; Irick, Marina; Fernando, Saranee; Parashar, Surita  
Vancouver, BC

**THE ISSUE:** People living with HIV (PLHIV) who had been disengaged from the workforce for long periods face several personal and structural barriers to re-entry. In addition to more common barriers, including momentum and professional experience and skills, PLHIV experience additional anxiety regarding HIV-related stigma, and bouts of illness and fatigue forcing disclosure to employers and co-workers. Punitive policies that govern social assistance compound these concerns and serve as additional disincentives to work-force re-entry.

**OUR COMMUNITY BASED APPROACH:** At Home At Howe (AHAH) is a community-based study that examines the impact of a supportive housing complex on the health of its residents. We conducted a review of field notes kept since the study's launch to identify the mechanisms and processes through which employment barriers were alleviated in the process of hiring two Peer Research Associates (PRAs) who provide research support for this study.

**PROGRESS:** The study team developed a low-barrier hiring process that included an open information session where interested candidates could ask questions prior to being invited to an interview. No formal CVs were required of candidates. The interviewers were respectful, straightforward and communicated openly.

When the job formally started, the research team was clearly committed to cultivating a fulfilling and low-barrier workplace experience. We participated in a robust and accessible training program and our knowledge and input were clearly valued by the study team. For example, opportunities were provided to contribute to all aspects of the project, meet senior members of the investigative team, and participate in national networking meetings. Involvement in this project has provided a boost in self-esteem, strong sense of belonging and purpose.

**LESSONS LEARNED:** Researchers interested in hiring PRAs must be as low barrier as possible in their approach to recruiting, hiring and training. Even the most low-barrier approaches could exclude people who lack the experience and momentum. Researchers should endeavour to use accessible language, ensure communication is open and honest, and work with peers to cultivate a flexible and empathetic work environment.

## CPR25

### THE MIRROR HAS TWO FACES – EXPLORING THE NEEDS OF FAMILY/FRIEND CAREGIVERS OF PEOPLE LIVING WITH HIV AND OTHER EPISODIC DISABILITIES IN ONTARIO

Yates, Tammy C<sup>1</sup>; Lero, Donna<sup>2</sup>

<sup>1</sup>Toronto; <sup>2</sup>Guelph, ON

**OBJECTIVES:** The Episodic Caregiver Support Initiative was launched in the fall of 2013 to explore the needs of family/friend caregivers of people living with HIV and other episodic disabilities in Ontario. The objective was to answer the question: What is the ideal model of support for family/friend caregivers of persons living with episodic disabilities?

**APPROACH:** Research involved a literature review, a survey of caregivers and persons with episodic disabilities, an environmental scan & an accompanying commentary to the scan, as well as in-person focus groups in order to get a deeper understanding of the challenges that are unique to this subset of family/friend caregivers.

**RESULTS:** Through the research and the stories shared, we learned that there was much that the broader social systems and we as a society could do in order to better demonstrate the value we intrinsically place on caregiving. The results fell within the following categories:

- Unique aspects of caregiving in an episodic disability context
- Impact of episodic disability on different care relationships
- Access to supports
- The ideal system

Drawing on the lessons learned from this project a model was developed to depict how caregivers need to be supported to address the life domains most impacted by their caregiving of a person living with episodic disability: education/information; job security and flexibility; income adequacy and security; health services; emotional wellness; and social supports.

**CONCLUSION:** The onset of episodic disabilities in young adulthood or midlife and the long-term, unpredictable and fluctuating nature of these illnesses yields challenges for caregivers that are both similar and different to those experienced by those who care for a person with a long-term disability or aging-related conditions.

## CPR26

### PHYSICAL AND MENTAL CHALLENGES IN PEOPLE LIVING WITH HIV: A QUALITATIVE STUDY AMONG PEOPLE LIVING WITH HIV (PHA) IN ONTARIO

MacTavish, John K; Rollins, Robert; Alvarado, Beatriz; Martinez Cajas, Jorge; Bachand-Lauko, Chris; Badge, Pride; Ubdegrove, Colin; Babcock, Joseph  
Kingston, ON

**BACKGROUND:** Opportunities for health, social participation and security are requisites to guarantee quality of life as people age. In this study, we document physical and mental health experiences of aging people living with HIV/AIDS (PHAs) in order to inform AIDS service organizations (ASOs) about perceived needs.

**METHODS:** Data was collected through a community-based participatory study with and for PHAs. Qualitative information on physical and mental health challenges over time was collected using in-depth interviews. Twenty two PHAs were interviewed. Nine of the participants were women, 10 came from rural areas, 14 reported previous or current drug addiction, and 8 had experienced previous incarceration. Trained peer-researchers performed the interviews in a local ASO. Analysis focused on finding common themes in the experiences reported by participants (prior and after HIV diagnosis, and changes over time) with special attention to similarities and differences across individual reports.

**RESULTS:** The majority of participants identified shifts in their physical health, from poor health at diagnosis to an improved current health. Antiretroviral medications, support from ASOs and connection with peers were related to those positive changes. As PHAs age, physical challenges were related to mobility problems, heart conditions and cancer rather than the HIV infection itself. In contrast, mental health challenges were common prior to and remained unchanged after HIV diagnosis. Depression, suicide ideation, and isolation were commonly experienced. Drug addiction negatively affects future health expectations. Participants identified lifestyle changes, drug addiction treatment, and more social support as key aspects to be addressed by ASOs.

**CONCLUSIONS:** Our findings highlight the importance of addressing mental health and drug addiction, as specific health issues related to PHAs. However, the experience of aging in PHAs suggests that the response also requires a non-HIV-related approach. Thus, ASO may need to look for linking PHAs to programs available to HIV-negative older adults.

## CPR27

### SOCIAL PARTICIPATION AND SECURITY WHILE AGING WITH HIV: A QUALITATIVE STUDY IN POPULATIONS FROM ONTARIO

MacTavish, John K; Rollins, Robert; Alvarado, Beatriz; Martinez Cajas, Jorge; Bachand-Lauko, Chris; Badge, Pride; Ubdegrove, Colin; Babcock, Joseph  
Kingston, ON

**BACKGROUND:** Opportunities for health, social participation and security are requisites to healthy aging. In this study, we documented the experiences of participation and security of aging PHAs in order to inform AIDS service organizations about perceived needs.

**METHODS:** Data was collected through a community-based participatory study with and for PHAs. Qualitative information on physical and mental health challenges over time was collected using in-depth interviews. Twenty two PHAs were interviewed. Nine of the participants were women, 10 came from rural areas, 14 reported previous or current drug addiction, and 8 had experienced previous incarceration. In-depth interviews asked questions on aspects related to social participation (i.e.

working, education, peer support, spiritual, social inclusion) and security (i.e. physical, financial, social). Analyses were done by researchers and peers, and organized qualitative data in common themes and giving particular attention to similarities and differences across individuals.

**RESULTS:** Most participants consider that social participation (in AIDS and non-AIDS related organizations) and/or networking with family and friends positive experiences. However, for some, stigma and drug addiction continue to hinder social participation. Two key themes emerged in the security topic: fear of disclosure and having a safe place. Again, HIV-related stigma and the “Law” were the main factors related to fear of disclosure and therefore feelings of insecurity. Most participants, especially those who have experienced incarceration, felt that having a stable lodging, support from family, and the support of ASOs are key to keeping their security as they age.

**CONCLUSIONS:** Social participation emerged as a key aspect to promote healthy aging among PHAs. Our findings also highlight the important role of ASOs in helping PHAs manage fear of disclosure, stigma and adequate housing. IDU and people with previous experience of incarceration are special groups to target.

## **CPR28**

### **HIV AND LONG TERM CARE: BARRIERS AND FACILITATORS TO HIV EDUCATION IN LONG TERM CARE HOMES**

**Mahan, Maureen; Siou, Kaitlin; Vijayanathan, Haran; Cartegena, Rod; de Prince, Karen; Chan-Carusone, Soo**  
Toronto, ON

A capacity building video series has been developed in order to prepare long term care (LTC) homes for an aging population of people living with HIV (PLHIV). A program evaluation has been completed to assess barriers and facilitators to HIV education in LTC in order to optimize uptake and foster an environment of inclusion for PLHIV. The HIV and LTC Video Series: Compassionate Care in a Changing Landscape was developed in partnership with a sub-acute HIV hospital (Casey House) and a LTC home (The Reikai Centres).

Four long-term care homes in Toronto were recruited to participate in a study to pilot two different approaches to disseminate video based HIV education and to identify barriers and facilitators to providing HIV education in long-term care. The homes were randomly assigned either as a control group to receive the educational videos in hard and soft copy formats to implement as part of their educational structure, or assigned to receive facilitated video training sessions with a registered nurse and a PLHIV. All four homes were provided with a copy of two 20 minute videos, Bedside Care and Families and Networks of Support. Data were collected from evaluation forms completed (n=147) from LTC staff who viewed the videos and from interviews with LTC home education coordinators (n=4). The consolidated evaluation data from the videos showed that 81% of LTC staff in the control group and 86% in the facilitated training group “somewhat to strongly agreed” they had acquired new information. In over 95% of responses it was indicated that the videos were an effective way of having the information delivered. As well, there was strong agreement that having someone available after the video to answer questions would be very helpful; however, there were no significant differences in the change in staff comfort level providing care for people living with HIV between the two groups.

## **CPR29**

### **BREAKING BARRIERS, ENABLING PEOPLE: EQUITABLE ACCESS TO REHABILITATION FOR PEOPLE LIVING WITH HIV WHEN, WHERE AND HOW THEY NEED IT**

**Murzin, Katherine**  
Toronto, ON

**BACKGROUND:** Through advances in HIV treatment, care and support over the past few decades, HIV is no longer a fatal illness. While we can rightly celebrate this success, our response must adapt to meet the new challenges associated with living with HIV as a chronic and potentially disabling condition. Recognizing the enabling potential of rehabilitation, the Canadian Working Group on HIV and Rehabilitation (CWGHR) is working to ensure equitable access to quality rehabilitation for people living with HIV.

**APPROACH:** Despite the promising potential, rehabilitation in the context of HIV remains under-recognized, undervalued, and underutilized component of the continuum of health care programs and services (CWGHR Discussion Paper, 2012). Cognisant of this, in 2013, CWGHR conducted a series of in-person and phone consultations to engage representatives from sectors which have a high stake in the rehabilitation agenda: HIV community (n=7), the Canadian Association of Occupational Therapy (n=8), the Canadian Physiotherapy Association (n=50). A reflexive iteration process was used to refine and interpret the consultation data which provided clear direction to the “Access to Rehabilitation Project” by identifying the challenges, opportunities and recommendations way forward.

**FINDINGS:** Though participants from the three sectors addressed issues specific to their professions and contexts, they held common opinions about the major barriers and strategies to accessing rehabilitation by PHAs. Some of the key issues identified include the lack of coordination between the traditionally isolated worlds of the chronic illnesses, disability and rehabilitation sectors; little integration for seamless rehabilitation services in the continuum of health and social care; cost and coverage issues; government delisting of services and funding cut; impeding health and social policies; lack of enough research evidence and best practice models; unavailability and lack of awareness on specialized services and stigma.

**CONCLUSION:** Based on the findings and recommendations from these consultations, CWGHR, in collaboration with other partners, is currently coordinating a “Pan-Canadian Rehabilitation Network” to facilitate cross-sectoral collaboration in education, research, policy change and programming initiatives.

## **CPR30**

### **ACT RESEARCH DAY: COMMUNITIES OF PRACTICE AND COMMUNITY-BASED KNOWLEDGE PRODUCTION IN THE RESPONSE TO HIV**

**Greenspan, Nicole R; Makoroka, Lydia; Challacombe, Laurel; McCullagh, John; Larsson, John; Husbands, Winston; Brotman, Mara**  
Toronto, ON

The ‘Community of practice’ concept (coined by Lave and Wenger in 1991) proposes that interaction among practitioners in the context of situated learning can lead to the development of new knowledge that responds to complex work-related issues. In this presentation, we will use community of practice concepts to understand and interpret the evolution, organization and impacts of ACT Research Day (ACTRD) in relation to local HIV service provision, research and policy.

ACTRD is a knowledge transfer and exchange event hosted by the AIDS Committee of Toronto (ACT) annually since 2003. The specific content of ACTRD varies from year to year, but it remains focused on presenting and discussing current research and the implications for HIV programs and policy among service providers, people living with HIV, researchers, policy makers and community members. The event also includes workshop-style segments that promote practical appreciation of emerging or critical issues. The one-day event attracts 80-100 participants annually.

This presentation draws on data collected from annual post-event evaluations, a multi-year review conducted in 2011 that included interviews and focus groups with multiple stakeholders, and our experiences organizing the event over several years. We interpret the ACTRD audience, participants and principal beneficiaries as constituting a community of practice. We then (a) review the extent to which the objectives of ACTRD have been met, (b) describe how features of ACTRD contribute to fostering mutual engagement among the community of practice involved in the response to HIV, (c) examine the role ACTRD plays in developing shared understandings of complex issues across a diverse range of stakeholders, and (d) explore the limitations of using community of practice concepts in relation to ACTRD.

In conclusion, we argue ACTRD demonstrates a community-based process of knowledge production, and illuminates the critical connection between research and practice in the response to HIV.

**CPR32****EXISTENTIAL CRISIS OR EXCITING NEW HORIZONS?  
HOW ASOS IN ATLANTIC CANADA PERCEIVE AND ARE  
PREPARING FOR INTEGRATION****Patten, San; Kirkland, Susan; Peddle, Sarah  
Halifax, NS**

AIDS service organizations (ASOs) have long been the cornerstone of a community response to HIV/AIDS. These ASOs have evolved to respond to complex policy and funding environments, each developing services/programs relevant for their own local environment. With indications that federal funding will integrate HIV, HCV and STIs (collectively known as sexually transmitted infections and blood borne pathogens, STBBIs), service providers and people living with HIV/AIDS in Atlantic Canada and across Canada are abuzz over the implications for organizational structures, service delivery and client engagement.

The Landscapes Project is a collaborative investigation into the current state of communicable diseases, affected populations, and associated service delivery needs in Atlantic Canada. Through document review and extensive consultations with service providers, partner organizations and key client populations in four Atlantic provinces, we identified the various ways in which ASOs are already integrating their services, their anxiety and optimism around integration, and service delivery models and principles that must be preserved. A total of 14 organizations and projects across Atlantic Canada that receive operational or project funding from PHAC participated in this work. Of the 33 in-person interviews, 12 were with Executive Directors or project leads from funded groups, 8 were staff members from partner organizations, and 12 service users or clients who have accesses programs or services.

This presentation will provide both service provider and client perspectives about: 1) how organizations in Atlantic Canada have already been integrating STBBIs; 2) the experienced and anticipated impacts of these shifts in service delivery on both ASOs and people who access their services; 3) the challenges and successes of integration for individual ASOs and their partner organizations; and 4) future forecasting of collaborative models to meet the needs of those living with and those most affected by communicable diseases in the Atlantic region. This project's results will not only guide ASOs and their partners in Atlantic Canada, but will have relevance to others outside of Atlantic Canada.

**CPR35****WHAT'S GLITTER GOT TO DO WITH IT?: EXPLORING  
YOUTH ENGAGEMENT AND HIV PROGRAMMING****Switzer, Sarah; Iyaruu, Tumaini; Manuel-Smith, Carver;  
Hernandez, Lydia; Seidu, Fonna; Apong, Kamilah; Bell, Ocean;  
McWhinney, Proudgodess  
Toronto, ON**

According to national surveillance data (1985-2011), young people, aged 15-29, make up 27% of all HIV nationally recorded HIV diagnoses. Sexual health curriculum is often not tailored to the diverse experiences, needs and identities of young people or the socio-structural and contextual factors (e.g., poverty, racism, homophobia) that influence HIV vulnerability. This may result in education that is often irrelevant and at its worst, detrimental to young peoples' sense of self and identity. One strategy for improving the relevance of HIV programming is to include young people in the design and development of programs and research. But what does meaningful youth engagement look like in practice? While some literature exists on the meaningful involvement of youth in sexual health research, research exploring critical issues of youth participation and engagement in HIV programming is limited, particularly for youth who have experienced marginalization. Similarly, engagement is often discussed but rarely defined or unpacked. This community-based practice session comes out of 10 workshops with young people involved in Empower, a youth-led HIV prevention program housed at Central Toronto Community Health Centre that uses the arts to train youth to develop and deliver workshops in their own community. In partnership with Gendering Adolescent AIDS Prevention (New College, University of Toronto) Empower youth met over 4 months to design presentations for clinicians, researchers and policy makers on what they thought was most important in building sexual health and harm reduction programs. In this session, youth presenters critically reflect on their experiences and understandings of participating

in harm reduction and HIV programming. How do we move beyond the transportation token? What does queer, trans and sex positivity have to do with it? How do we structure spaces so we can work across difference? What does harm reduction programming look like in practice? What does glitter have to do with it?

**CPR36****"RESEARCH SHOULDN'T SIT ON A SHELF" – OPTIMIZING  
THE HEALTH OF ONTARIO WOMEN LIVING WITH HIV  
(WLWH) THROUGH KNOWLEDGE TRANSLATION AND  
EXCHANGE (KTE)****Morshed, Mubnii; Tharao, Wangari; Loutfy, Mona; Logie, Carmen  
Toronto, ON**

**BACKGROUND:** The 2010 CBR project, "Involving Ontario HIV-Positive Women and their Service Providers in Determining their Research Needs and Priorities" collected large amounts of data highlighting the needs and challenges facing WLWH including: barriers to access, intersections with multiple systems of oppression, research priorities to inform services, and strategies to support participation of WLWH as partners in research. Our objective is to highlight the innovative KTE strategy developed to mobilize the findings by utilizing the participants' own stories and voices.

**METHODS:** The main KTE component was a 3-day digital storytelling workshop involving participants and community-based HIV researchers. The 7 videos created illustrate the complex lives of WLWH, while simultaneously sharing the results of the WCBR project. Additional KTE components included:

1. Regional community meetings/forums across Ontario to discuss study results and future steps
2. 40 page community report summarizing project results
3. Manuscript publications in open access journals
4. Interactive website combining all KTE components as a stigma-reduction tool tailored to target audiences.

**RESULTS:** The KTE strategies effectively disseminated study findings and their translation into action, with increased transparency of the research process. They target 5 distinct but overlapping audiences: service users, community leaders/advocates, service providers, researchers and policy makers. Key results of the KTE strategy were:

1. Over 700 views of Digital Storytelling videos on YouTube
2. 11 Community Forums/video screenings across Ontario
3. Community report disseminated via print & online
4. 7 papers published in peer-reviewed journals

The uptake of the KTE strategy was successful, with multiple service providers across Ontario now using the videos in their work with WLWH. Evaluation and feedback from the community also supported the conceptualization and development of an online stigma intervention toolkit launching in 2015.

**CONCLUSIONS:** These KTE strategies utilize multiple mediums, address barriers to knowledge uptake, and emphasize the co-ownership of the research process. These approaches provide insight into the complex lives of WLWH, including intersecting identities, social determinants of health, and the systems through which they navigate and/or provide services.



# AUTHOR INDEX / INDEX DES AUTEURS

## A

Ablona A. ....SS31  
 Abou M. .... O005  
 Adam B. .... EPH25  
 Adam B. .... O023,EPH30,EPH30,  
 .... EPH67,SS32,SS35,SS36  
 Adam BD. .... O098,EPH58  
 Adrien A. .... O042  
 Agbebi AC. .... EPH81  
 Agha A. .... CPR21  
 Ahmed A. .... BS03  
 Ahmed FK. .... BS30  
 Ahmed R. .... CS52  
 Ajamian L. .... BS23  
 Ajaykumar A. .... O096  
 Ajoge H. .... O026  
 Akao J. .... CS15  
 Akello M. .... EPH14,EPH72  
 Akolo M. .... O086  
 Akpoigbe K. .... O097  
 Alary M. .... EPH08,EPH09,EPH19  
 Albert AY. .... O096,BS02  
 Alex T. .... O058  
 Alexander D. .... O082  
 Al-Ghazawi F. .... O003  
 Ali R. .... SS73  
 Alimenti A. .... O089,O090,O091,O096,  
 .... EPH10,EPH11  
 Allam O. .... BS03  
 Allen C. .... O102,CS13  
 Allen VG. .... CS20,EPH06,EPH39  
 Allison J. .... O076  
 Allman D. .... O110,SS13,SS33  
 Alonso M. .... BS33  
 Alos N. .... O091  
 Alvarado B. .... EPH25,EPH30,CPR26,CPR27  
 Alvarado BE. .... EPH31,EPH73  
 Amanda S. .... BS04  
 Amirault M. .... SS01,CPR04  
 Amlani A. .... EPH35  
 Anaquod J. .... CPR04,SS01  
 Ancuta P. .... O002,O009,BS15,BS51  
 Andany N. .... O039  
 Anderson J. .... EPH16  
 Anderson S. .... O105,SS61,CPR13  
 Anema A. .... SS16,CPR01  
 Angel JB. .... O062,BS27,BS49,BS50,BS54  
 Anipindi V. .... O087  
 Anmole G. .... O083  
 Anstett K. .... BS24,BS25  
 Antoniou T. .... O012,O039,O065,O101,O103,  
 .... CS01,CS08,CS09,CS63,  
 .... EPH13,EPH77,EPH83,CPR21  
 Ao Z. .... O030  
 Apellaniz B. .... BS30  
 Apong K. .... CPR35  
 Ara A. .... O061  
 Arbess G. .... O007  
 Archibald C. .... O098,EPH21  
 Argento E. .... O043  
 Arisz A. .... CS41  
 Arkell C. .... EPH46  
 Arneson C. .... CS48,CS50  
 Arnold E. .... O056  
 Arnold K. .... O005,O006  
 Arribas J. .... CS19  
 Arts E. .... O085,CS15

Arts EJ. .... BS52,CS30  
 Asad S. .... BS26  
 Asamoah A. .... EPH54  
 Asbridge M. .... EPH28  
 Asey A. .... O024  
 Asghari S. .... EPH47,EPH82,EPH84  
 Ashkar AA. .... O087  
 Ashraf W. .... O072  
 Askari S. .... EPH48  
 Atkinson J. .... CPR17  
 Atkinson M. .... O007,CS34  
 Austin A. .... O072  
 Avihingsanon A. .... CS19  
 Aydin H. .... BS47  
 Aykroyd G. .... EPH60,SS40  
 Azar I. .... BS39

## B

Babcock J. .... CPR26,CPR27  
 Babusis D. .... BS16  
 Bachand-Lauko C. .... CPR26,CPR27  
 Bacon J. .... O101,CS01,SS75  
 Badge P. .... CPR26,CPR27  
 Baiden P. .... O024  
 Bailey R. .... CS25  
 Baird K. .... SS02  
 Bakhoun AY. .... EPH42  
 Balachandran A. .... O058,O059  
 Balakireva O. .... EPH37,EPH40  
 Balfour L. .... O016  
 Ball TB. .... O006,BS08,BS33  
 Baltzer Turje R. .... O045,O067,O115,  
 .... EPH22,EPH26,EPH49,  
 .... SS19,SS43,SS59,SS20  
 Baluka S. .... CS51  
 Bangsberg DR. .... O084,BS20,CS16  
 Banko N. .... O094,CS44  
 Banko NS. .... CS39  
 Banks P. .... CPR18  
 Bannar-Martin S. .... EPH32  
 Barbeau B. .... BS44  
 Baril J-G. .... CS29  
 Barker B. .... EPH80  
 Barnes M. .... EPH22  
 Barr S. .... O026  
 Barrios R. .... EPH26,EPH50,SS59  
 Barry A. .... SS73  
 Barry C. .... BS33  
 Barry F. .... O095  
 Bauer GR. .... EPH60,EPH62,EPH65,SS40  
 Bayoumi A. .... CS09,CS63,EPH13  
 Bayoumi AM. .... O039,O103,CS08,CS20,  
 .... EPH06,EPH77,EPH83,SS66  
 Bédard M. .... O025  
 Beaver K. .... O066,O113,CS55,CS56,  
 .... EPH04,EPH12,EPH34,  
 .... EPH43,EPH53,SS42  
 Beavis AS. .... O014,O051,EPH36  
 Becker ML. .... EPH37,EPH40,EPH51  
 Beckerman A. .... SS16  
 Bekele T. .... O077  
 Bekele TM. .... O007,CS34  
 Belanger K. .... BS35,BS47  
 Bell B. .... O025,O028  
 Bell O. .... CPR35  
 Belle-Isle L. .... O100,EPH28,SS55  
 Bendayan R. .... BS32,BS57  
 Benko E. .... O008

Benoit A. .... O066,CS01,CS02,EPH04  
 Benoit AC. .... CS55,CS56,EPH43,EPH53  
 Benoit C. .... SS55  
 Benson E. .... CS02,CS55,CS56,EPH53  
 Benz TC. .... O102  
 Berbiche D. .... EPH33  
 Bernard N. .... BS14  
 Bernard NF. .... BS11  
 Bertozzi B. .... CS41  
 Bertrand K. .... EPH33,SS63  
 Betancourt G. .... EPH25,SS09,SS14  
 Betancourt GA. .... SS14  
 Bielawny T. .... BS33  
 Biggin J. .... EPH84  
 Bilbao-Joseph C. .... CPR02  
 Billimoria H. .... EPH68,EPH69,EPH70  
 Birse K. .... O005,O006  
 Biru T. .... CS30  
 Birungi J. .... EPH72  
 Bisignano AC. .... SS25  
 Bitera R. .... O069  
 Bitnun A. .... O089,O090,O091,O096,  
 .... CS48,CS50,EPH10,EPH11  
 Blackwell ED. .... SS41  
 Blair AH. .... O015,O044,O049,EPH05  
 Blais M. .... O019,O078,CS40,SS27,SS49  
 Blanchard J. .... EPH01  
 Blanchard JF. .... EPH37,EPH40  
 Blanchette C. .... EPH08,EPH19  
 Bélanger M. .... O002,BS32  
 Blencowe BJ. .... O058  
 Blitz S. .... O038,CS01,CS09  
 Blouin K. .... EPH08,EPH19  
 Bogoch II. .... CS57  
 Boily-Larouche G. .... O001,O086  
 Boivin J-F. .... EPH33  
 Bond V. .... O080  
 Boodram C. .... SS07,SS60  
 Bottorff JL. .... SS04  
 Boucher M. .... O081,BS07  
 Boum Y. .... BS20  
 Bowes J. .... O091  
 Branch DR. .... BS42,BS59  
 Brander C. .... O083  
 Brassard P. .... O002,BS32  
 Brennan D. .... O072  
 Brennan DJ. .... O021,O022,O023,O050,  
 .... O075,SS15,CS65,  
 .... EPH61,EPH66,EPH67  
 Brenner B. .... O082,BS31  
 Brenner BG. .... O041  
 Brisebois J. .... CS14  
 Brockman MA. .... O060,O083  
 Broliden K. .... O088  
 Brooks J. .... O098  
 Brophy J. .... O089,O090,O096,O114,  
 .... CS47,EPH11  
 Brophy JC. .... EPH10,O091  
 Brotman M. .... CPR30  
 Brouillette MJ. .... CS32  
 Brouillette M-J. .... CS35,CS61,EPH48  
 Brouwer KC. .... EPH71  
 Brown J. .... EPH17  
 Brown M. .... CS61  
 Brownlee P. .... SS01,CPR04  
 Brumme CH. .... CS62  
 Brumme CJ. .... BS20,BS21,CS16

Brumme ZL . . . . . O060,O083,O084,BS19  
 Bruneau J . . . . . BS11  
 Brunetta J . . . . . O007,O037,CS22,CS34,EPH45  
 Buchan S . . . . . O016  
 Buchbinder S . . . . . O084  
 Buchner C . . . . . EPH32,EPH35  
 Buhler S . . . . . O113  
 Building Bridges Research Team, The . . . . . CS55,  
 . . . . . CS56,EPH53  
 Building Bridges Team, The . . . . . CS02  
 Bullard J . . . . . O014  
 Burchell A . . . . . O037,O082,O101,O103,  
 . . . . . CS01,CS02,CS07,CS09,  
 . . . . . CS22,CS55,CS56,CS63,  
 . . . . . EPH15,EPH43,EPH58,EPH79  
 Burchell AN . . . . . O007,O012,O039,O065,  
 . . . . . CS08,CS20,CS34,CS66,  
 . . . . . EPH06,EPH13,EPH39,EPH77,  
 Burgener A . . . . . O005,O006  
 Burke SC . . . . . BS01  
 Burt K . . . . . EPH47,EPH84  
 Buxton J . . . . . EPH35,SS81

# C

Cabarios C . . . . . SS35,CPR05  
 Cabral T . . . . . BS36  
 Cain R . . . . . O056  
 Caine V . . . . . SS68  
 Cali C . . . . . EPH30,EPH31  
 Callaway R . . . . . O100  
 Callebaut C . . . . . BS16,CS14  
 CalveZ SS . . . . . CPR07  
 Calzavara L . . . . . CS22  
 Cameron C . . . . . O080,SS77  
 Cameron R . . . . . SS73  
 Cameron W . . . . . O016  
 Campillo-Guimenez L . . . . . BS38  
 Canadian Co-infection  
 Cohort Investigators, The . . . . . SS26  
 Canadian Pediatric & Perinatal AIDS  
 Research Group (CPARG), The . . . . . O089,  
 . . . . . O090,EPH10,EPH11  
 Cao W . . . . . O064,BS13,CS27,CS29  
 Capina R . . . . . O100,BS33  
 Caprara D . . . . . CS45  
 Carlson JM . . . . . O084  
 Carrasco-Medina L . . . . . BS01,BS04  
 Carrington M . . . . . O084  
 Cartegena R . . . . . CPR28  
 Carter A . . . . . O066,O113,EPH04,EPH12,  
 . . . . . EPH34,EPH63,CPR20,CPR24  
 Caruso J . . . . . SS37  
 Carvalhal A . . . . . O007,CS34,CS41,CS43  
 Caté C . . . . . BS44  
 Cattaneo J . . . . . EPH67,SS45  
 Cavalieri W . . . . . EPH28  
 Cavanagh A . . . . . CS22  
 Cavanagh C . . . . . O029  
 Cavanagh PC . . . . . BS37  
 Cedar Project Partnership, The . . . . . O044,O049,  
 . . . . . EPH29,  
 . . . . . SS04,SS05  
 Cescon A . . . . . O082,CS06,EPH13  
 Challacombe L . . . . . CPR30,EPH46  
 Challacombe LA . . . . . CPR13,CPR14,  
 . . . . . CPR15,CPR16  
 Chambers L . . . . . O117,SS50  
 Chan L . . . . . O052,O053,SS69  
 Chan R . . . . . BS14

Chan-Carusone S . . . . . O067,O075,CS65,  
 . . . . . EPH22,SS19,SS21,CPR28  
 Charest L . . . . . CS04,CS60  
 Charter Group, The . . . . . CS35  
 Chartrand M-C . . . . . EPH24  
 Chau W . . . . . O011,CS21  
 Chen A . . . . . BS36  
 Chen AT . . . . . O058,O059  
 Chen YY . . . . . SS35  
 Cheng SY . . . . . O039  
 Cherid H . . . . . O003  
 Cheruiyot J . . . . . O001,O086  
 Chetchotisakd P . . . . . CS19  
 Chettiar J . . . . . O043,SS56  
 Cheuk E . . . . . EPH01  
 Cheung A . . . . . CS36  
 Chew D . . . . . SS23,SS24  
 Chew M . . . . . O087  
 Chikermane V . . . . . O117,SS50,CPR06  
 Chittock B . . . . . EPH27,CPR01,CPR20  
 Chittock BW . . . . . SS16  
 CHIWOS Research Team, The . . . . . O066,O113,  
 . . . . . EPH04,EPH12  
 Chomont N . . . . . O002,BS32  
 Choudhury D . . . . . O051  
 Chouikh Y . . . . . BS51  
 Chow N . . . . . EPH32  
 Chowdhury F . . . . . CS26  
 Chown S . . . . . O107  
 Christian KW (Chief) . . . . . SS05  
 Chultem M . . . . . EPH38  
 Chun TW . . . . . O008  
 Chunduri S . . . . . CPR23  
 CIHR Team on Cellular Aging and HIV  
 Comorbidities in Women and Children  
 (CARMA), The . . . . . BS07  
 Claybo D . . . . . SS33  
 Cochrane A . . . . . O058,O059,BS36,  
 . . . . . BS45,BS48,BS53  
 Cockerill R . . . . . O048  
 Colas J . . . . . O114  
 Coleman M . . . . . O026  
 Coleman TA . . . . . CS59,EPH60,EPH62,EPH68,  
 . . . . . EPH69,EPH70,SS40  
 Canadian Observational Cohort  
 Collaboration (CANOC) . . . . . O082,CS02,  
 . . . . . CS55,CS56,EPH13  
 Colley G . . . . . O011,O035,O066,O082,O104,  
 . . . . . CS53,CS54,EPH02,EPH03,  
 . . . . . EPH04,EPH12,EPH13,EPH17,  
 . . . . . EPH34,EPH49,EPH50  
 Collins E . . . . . CS07,CS22,CS34  
 Compton M . . . . . EPH27  
 Condran B . . . . . O071,O112,EPH76  
 Condran BR . . . . . EPH23  
 Conway B . . . . . O036,CS11,CS12,CS23  
 Conway T . . . . . O012,O113,EPH43  
 Cooper C . . . . . O012,O017,O033,O034,O082,  
 . . . . . O101,CS01,CS02,CS08,CS25,  
 . . . . . CS26,CS55,CS56,CS66,  
 . . . . . EPH13,EPH39,EPH77,SS21  
 Cooper CL . . . . . BS01  
 Correa D . . . . . EPH30  
 Correia-Pinto J . . . . . BS33  
 Côte HC . . . . . O096,BS02,BS07,BS09,BS10  
 Côte SC . . . . . O062,BS49,BS50  
 Cote H . . . . . O091  
 Cotnam J . . . . . EPH43  
 Cotterchio M . . . . . O039

Cotton LA . . . . . O083,O084  
 Coulombe J . . . . . EPH24  
 Courtemanche Y . . . . . EPH09  
 Coutlee F . . . . . O038  
 Cox J . . . . . O017,O042,CS61,EPH24,SS26  
 Coyte P . . . . . EPH04  
 Craig S . . . . . CS65,O075  
 Craig SL . . . . . O072  
 Crawley AM . . . . . BS01,BS04,BS54  
 Creal L . . . . . SS19,SS21  
 Creighton T . . . . . O097  
 Crofoot G . . . . . CS19  
 Cruising Counts Study Team, The . . . . . O021,  
 . . . . . O022,EPH61  
 Cubillos M . . . . . EPH25,EPH30  
 Cui Z . . . . . O011,O020,O046,CS06,  
 . . . . . EPH03,EPH17,EPH18,  
 . . . . . EPH49,EPH59,EPH63  
 Cupido P . . . . . O012  
 Cutillas V . . . . . BS24,BS25  
 Cysique L . . . . . O007,CS34  
 Czarnecki C . . . . . BS33

# D

D'Souza S . . . . . O072  
 DaFonseca S . . . . . BS11  
 Daher A . . . . . BS39  
 Dalgarno G . . . . . O115  
 Daniels SM . . . . . BS39  
 Daniels T . . . . . CPR09  
 Daniuk C . . . . . BS33  
 Davis M . . . . . O045  
 de Pokomandy A . . . . . O066,O113,  
 . . . . . EPH04,EPH12,EPH34  
 de Prince K . . . . . EPH22,SS21,CPR28  
 DeBeck K . . . . . EPH80  
 Deering KN . . . . . O043  
 DeGrado WF . . . . . BS30  
 dela Cruz A . . . . . SS68  
 Dell C . . . . . EPH28  
 Demerais L . . . . . EPH29  
 Demetrakopoulos AS . . . . . SS17  
 Deshapriya P . . . . . EPH68,EPH69,EPH70  
 Deshiere A . . . . . O087  
 Desjardins E . . . . . SS26  
 Dias Lima V . . . . . CS21  
 Dieterich D . . . . . O033  
 Dikeakos J . . . . . O029  
 Dikeakos JD . . . . . O032,BS37,BS46  
 Dilley L . . . . . CPR10  
 Ding E . . . . . CPR01  
 DirK BS . . . . . BS37  
 Djiometio JN . . . . . CPR21  
 Dobinson C . . . . . O072  
 Dobrer S . . . . . O043,SS56,SS57  
 Donelle L . . . . . O047  
 Dong H . . . . . EPH80  
 Dong W . . . . . BS19,CS16  
 Dos Santos S . . . . . CPR19  
 Doualla-Bell F . . . . . O069  
 Doukas N . . . . . O024  
 Doyle C . . . . . EPH24  
 Drolet M . . . . . CS25  
 Dubé A . . . . . O071,O112,EPH76  
 Dubuc D . . . . . O113,SS62  
 Duddy J . . . . . CPR09,CPR11  
 Duff P . . . . . SS56,SS57  
 Dulai J . . . . . O047  
 Dumbrell G . . . . . SS42

Dunphy L. .... O005  
 Duplessis L. .... O072  
 Dutta R. .... O011  
 Dykeman M. .... O071,EPH76

**E**

Edmiston L. .... CPR14,CPR15,CPR16  
 El Salfiti A. .... O003  
 El-Far M. .... O009,BS51  
 Elkashab M. .... CS25  
 Ellis B. .... O082,CS35  
 Emmanuel F. .... EPH37,EPH40  
 Emond G. .... O069  
 Ens C. .... O014,EPH36,EPH51  
 Erickson M. .... EPH14  
 Estaquier J. .... BS38,O031  
 Este D. .... SS58  
 Eyawo O. .... O104

**F**

Falkenhagen A. .... BS26  
 Fall A. .... O042  
 Faller E. .... O003,BS12  
 Fallu J. .... CS61  
 Farley J. .... CS25  
 Farr Zuend C. .... O057  
 Farrell A. .... EPH82  
 Fauteux-Daniel S. .... O081  
 Feber J. .... O091  
 Fedida D. .... O060  
 Feinman SV. .... CS25  
 Fellows L. .... CS32,CS35  
 Fellows LK. .... EPH48  
 Fenik J. .... SS34,CPR18  
 Ferlatte O. .... O047,SS37  
 Fernandes J. .... BS27  
 Fernandes-Penney A. .... CS48  
 Fernandez Casanueva C. .... EPH71  
 Fernando S. .... SS59,CPR24  
 Fernando SM. .... EPH26,SS20  
 Fernet M. .... O078,CS40,SS27  
 Fielden SJ. .... SS16,CPR01  
 Fisman D. .... EPH39  
 Flicker S. .... O072,SS47  
 Flores-Aranda J. .... SS63  
 Flowers P. .... O047  
 Foebel AD. .... EPH86  
 Foisy M. .... CS42,SS48  
 Foisy MM. .... CS17,CS52  
 Food Security Study Team, The. .... CPR01  
 Ford P. .... EPH79  
 Fordyce M. .... CS14,CS19  
 Forrest JI. .... EPH63  
 Fowke K. .... CS26  
 Fowke KR. .... O001,O086,BS05  
 Fowler S. .... O116,SS08  
 Fraser M. .... O051,EPH60,EPH62,SS40,SS08  
 Frey CR. .... BS16  
 Friedman A. .... EPH29  
 Fuchs J. .... O084  
 Fung KP. .... SS25

**G**

Gahagan J. .... O056,O071,O079,O112,O113,  
 .... EPH23,EPH76,CPR17  
 Gajanayaka N. .... BS27  
 Galanakis C. .... O018,CS04,CS60  
 Galindo J. .... EPH30,EPH31,EPH73  
 Galindo MI. .... EPH73  
 Ganase B. .... CS24

Gao Y. .... O085  
 Gardner S. .... O012,O023,O065,O082,O101,  
 .... CS01,CS09,CS20,CS34,EPH15,  
 .... EPH43,EPH58,EPH67,EPH79,SS23,SS24  
 Gardner SL. .... EPH06,EPH39  
 Gartner K. .... CS21  
 Gatignol A. .... BS39  
 Gatov E. .... CS41  
 Gbadebo K. .... O052,O053,SS69  
 George R. .... BS28  
 Georgievski G. .... O050,SS15  
 Germain A. .... SS65,SS67  
 Gerpe MCR. .... BS47  
 Gesink D. .... EPH45  
 Ghadaki B. .... CS37  
 Ghoneim RH. .... BS55  
 Giblon R. .... EPH60,SS40  
 Gibson RM. .... CS15  
 Giguère P. .... SS48  
 Gilbert M. .... O047,O107,EPH15,EPH39  
 Gill J. .... O007,O017,O082,CS34,CS62  
 Gill MJ. .... O068,CS03  
 Gillis J. .... EPH77  
 Gillis JR. .... EPH54  
 Gilmore N. .... CS61  
 Girard G. .... SS32,SS36  
 Glazier R. .... O039,O103,CS63,CS64  
 Globerman J. .... O065,O077,O098,  
 .... EPH58,SS16,CPR01  
 Goggin P. .... O074  
 Gohil H. .... EPH46  
 Goldenberg S. .... EPH57,SS57  
 Goldenberg SM. .... EPH14,EPH71,EPH72  
 Gomez AM. .... O004  
 Gonzalez-Serna A. .... CS62  
 Goondi D. .... CS42  
 Gosselin A. .... BS15,BS51  
 Gough K. .... EPH39  
 Goulet J-P. .... BS15  
 Grace D. .... O107  
 Gravel C. .... BS07,BS05,CPR18  
 Green D. .... CS09  
 Greene S. .... O113,CS41,CS43,  
 .... EPH85,SS01,SS42,CPR04  
 Greenspan NR. .... O048,O076,CPR30  
 Grennan T. .... O037,O116,CS22,CS58,  
 .... CS59,EPH45,EPH58,SS08  
 Grewal R. .... CS20,EPH06,EPH39  
 Gruslin A. .... O016  
 Guillemi S. .... CS21,EPH50,SS59  
 Gulzar N. .... BS30  
 Gunther M. .... CS52  
 Gupta S. .... CS19  
 Guta A. .... SS21

**H**

Habib T. .... O025,O028  
 Haeryfar M. .... O029,O032  
 Hagen B. .... O102  
 Haider S. .... CS37  
 Haig T. .... O019  
 Haig TA. .... SS06,SS37  
 Hakobyan S. .... O036,CS11  
 Hall D. .... EPH17  
 Halpenny R. .... EPH45  
 Halverson J. .... EPH21  
 Hamelin A-M. .... SS26  
 Hammann M. .... CPR18

Hanass-Hancock J. .... O080  
 Haoua I. .... O114  
 Hardy I. .... O041  
 Hari S. .... SS50  
 Harrigan PR. .... O035,O082,O084  
 .... BS19,BS20,CS62  
 Harrigan R. .... BS21,CS16  
 Harris A. .... BS08  
 Harris G. .... O071,O112,EPH76,CPR22  
 Harris M. .... O038,CS24,CPR19  
 Hart T. .... O047,CS58,EPH25,EPH30,EPH43,  
 .... SS08,SS31,CPR06  
 Hart TA. .... O023,O116,CS59,CS66,  
 .... EPH58,EPH66,EPH67,  
 .... EPH68,EPH69,EPH70  
 Hassounah S. .... BS25,BS31  
 Hastings C. .... SS75  
 Hatchette T. .... CPR17  
 Hathaway A. .... EPH28  
 Hatzipantelis M. .... SS75,CPR19  
 Hawa R. .... SS50  
 Hawkes M. .... CS47  
 Hayashi K. .... BS19  
 Hébert M. .... SS49  
 Heaton RK. .... CS35  
 Henderson E. .... O044,O049  
 Hernandez A. .... CPR10  
 Hernandez L. .... CPR35  
 Herrera A. .... SS06  
 Hill C. .... CPR04,SS01  
 Hill J. .... O038  
 Hirdes JP. .... EPH86  
 Ho A. .... SS81  
 Hoch J. .... EPH83  
 Hogel M. .... EPH82  
 Hogg R. .... O020,O082,CS02,CS08,CS55,  
 .... CS56,EPH04,EPH26,EPH49,  
 .... EPH50,EPH53,EPH77,SS20  
 Hogg RS. .... O011,O035,O046,O063,O066,  
 .... O104,O106,CS06,CS53,CS54,  
 .... EPH02,EPH03,EPH12,EPH13,  
 .... EPH17,EPH18,EPH34,EPH59,  
 .... EPH63,SS16,SS41,SS59,CPR01  
 Hojjati A. .... O051  
 Holliday E. .... EPH27,EPH32  
 Holtzman S. .... O100  
 Hopkins S. .... EPH78  
 Hoque MDT. .... BS32,BS57  
 Horwitz MS. .... O057  
 Hosein SR. .... O082  
 Houston S. .... CS42  
 Howard PA. .... SS18  
 Howard T. .... O046  
 Hoyano D. .... EPH32  
 Hsieh A. .... BS09,BS10  
 Hsieh YU. .... CS23  
 Hu H. .... CS36  
 Huang B. .... BS32  
 Huang D. .... CS52  
 Huang Y. .... O056  
 Huchet E. .... O018,CS04,CS60  
 Hughes CA. .... O010,CS42  
 Hui C. .... SS25,SS35  
 Huibner S. .... O008  
 Hull M. .... O011,O034,O035,O104  
 .... CS02,CS08,CS24,CS55,CS56,  
 .... EPH18,EPH53,EPH77  
 Hull MW. .... CS53,CS54



Hunt PW ..... BS20  
Hunter C ..... O025  
Hurley O ..... EPH47,EPH82  
Husbands W. . . . . O065,EPH66,EPH67,CPR30  
Huskins B. .... CPR22  
Hyshka E ..... EPH16,EPH28

# I

Ibanescu I. .... O041  
Ibáñez-Carrasco F. .... O080,SS19,  
..... SS75,O067,CPR19  
Intersectoral Coalition  
of the MOBILISE! Project, The ..... SS06  
Ion A. . . . . CS41,CS43,EPH85,SS01,SS42,CPR04  
Ireland L. .... O014,EPH36,EPH51  
Irick M. .... O082,CS02,EPH13,CPR24  
Isac S ..... EPH01  
Isitman G. .... BS11  
Islam S ..... O117  
Ismail M. .... EPH47

# J

Jackson E ..... SS32,SS36,CPR12,CPR13  
Jackson L ..... O112,EPH76  
Jackson R. .... O050,CS55,CS56,EPH53,  
..... SS01,SS15,CPR04  
Jacob RA ..... O032,BS37,O029  
James D ..... O067  
Jardine S. .... O102  
Jaworsky D. .... O011,CS02,CS55,CS56,  
..... EPH53,SS23,SS24  
Jayappa KD. .... O030  
Jean-Pierre P ..... BS23  
Jembere N ..... O103  
Jenabian MA ..... BS03  
Jenabian M-A ..... O002,O009,BS13,  
..... BS15,BS32,BS51  
Johnson AL ..... O032,BS37  
Johnston C. .... SS41  
Johnston S ..... EPH82  
Jolimore J. .... O107,SS37,EPH02,  
..... EPH17,EPH59  
Jolly A ..... EPH31  
Jones JE ..... SS16,CPR01  
Jongbloed K ..... O044,O049,EPH29  
Jose M. .... O067,O077,SS73  
Joseph C. .... O072  
Joshi S ..... BS26  
Joy JB ..... O082  
Juno J ..... BS05  
Junod P. .... CS04

# K

Kaida A ..... O063,O066,O106,O113,  
..... CS06,EPH04,EPH12,  
..... EPH34,EPH49,EPH63  
Kakal J ..... O003  
Kakkar F. .... O089,O090,O092,O096,  
..... BS07,CS49,EPH10,EPH11  
Kalaria D ..... CS18  
Kamangu E ..... BS56  
Kamangu EN ..... BS17,BS40,BS41  
Kandel G ..... O008  
Kang H. .... EPH50  
Kao C-CA ..... BS57  
Kapocy C ..... O076  
Karakas A. .... BS21,CS16  
Karges W ..... BS01  
Karim S ..... O005  
Karimian Pour N ..... BS58

Karniyuchuk U. .... O087  
Kashem MA. .... BS18  
Kasper K. .... O014,EPH36,EPH51  
Kassam A. .... O051  
Katamba A. .... EPH05,O015  
Kaul R ..... O005,O008,O037,O040,  
..... CS20,CS22,EPH06,EPH45  
Kaur A ..... O054,SS83  
Kaushic C. .... O087  
Kay R ..... O100  
Keewatin C ..... SS61  
Kellman C ..... CS02,EPH53  
Kelly D. .... O082,EPH47  
Kelly DV ..... EPH84  
Kelly-Shepard R. .... CS61  
Kema I ..... O009  
Kendall C. .... O012,O039,O101,O103  
..... CS01,CS63,EPH82  
Kennedy R ..... O077  
Kennedy V ..... SS30  
Kennedy VL ..... O093,O095,EPH85  
Kerba J-P ..... CS60  
Kerr J ..... O052,O053,SS69  
Kerr T. .... O105,O109,EPH80,SS54,SS61  
Keshane M. .... CS55,CS56  
Keshane M. .... EPH53  
Keshmiri R. .... CS43,EPH04  
Kesler MA ..... O037,EPH45  
Kesselring S ..... CPR24,EPH49  
Kestler M ..... EPH49  
Keynan Y ..... O014,CS26,EPH36,EPH51  
Khouidgian S ..... O099  
Kia H ..... SS38  
Kielly J ..... EPH84  
Kielstra L ..... EPH79  
Kigozi SH ..... BS20  
Kille J ..... SS76  
Kim A ..... CS11  
Kim C ..... O008  
Kim J ..... EPH31  
Kim J-H ..... BS14  
Kimani J ..... O001,O005,O086,BS05  
Kimani M. .... O001,O086  
King D ..... O070  
Kingola N ..... EPH01  
Kingston ON ..... EPH30  
Kinloch NN ..... O084  
Kirkby D ..... CS16  
Kirkland S ..... EPH26,SS59,CPR32  
Kitrinos K. .... BS16,CS14  
Klein K. .... O085,CS30  
Klein M ..... O038,O082,CS02,CS08,  
..... CS09,CS55,CS56,EPH77  
Klein MB. . . . . O017,O034,CS61,EPH13,SS26  
Knight J ..... EPH47  
Knight R ..... O073,EPH56  
Kobinger G. .... BS33  
Koblin B. .... O084  
Kocilowicz J ..... SS26  
Kohio H ..... O026  
Kolla G. .... SS66  
Konarski Y ..... BS54  
Kopp A. .... O039,O103  
Koshman S ..... O010  
Kostiuk M ..... BS28  
Kou N ..... CPR21  
Kovacs C ..... O007,O008,O098,CS34  
Kozai T ..... CS24

Kozlowski HN ..... BS42,BS59  
Kozlowski M. .... O038,O081,BS27  
Kremer H ..... O011  
Krentz HB ..... O068,CS03  
Kronfli N ..... CS37  
Krüsi A ..... O109,SS54  
Kuang XT. .... O083  
Kulatilake R. .... O072  
Kumar A. .... BS27  
Kuzmanovic D ..... SS22  
Kwatampora J. .... O005  
Kyeyune F. .... CS15

# L

L'Africain F ..... O081  
La D ..... BS33  
Lacap P. .... O088,BS18,BS33  
Lachowski C ..... BS20  
Lachowsky N ..... O020,EPH63  
Lachowsky NJ . . . O021,O022,O046,EPH02,  
..... EPH17,EPH18,EPH59,  
..... EPH61,SS41,CPR18  
Lacombe-Duncan A. .... O024,O055,SS58  
Laforge M. .... O031,BS38  
Lai E. .... BS42  
Lajoie J. .... O001,O086,BS05  
Lal A. . . . . O020,O046,EPH02,EPH17,EPH59  
Lam C ..... BS47  
Lamarre V ..... O092,BS07,CS49  
Lambert G ..... O074  
Lamin DF. .... O070  
Lamoureux R ..... SS20  
Langlois A ..... CPR09,CPR20  
Langlois M-A. .... BS35,BS47  
Lapointe HR ..... CS16  
Lapointe N. .... O078,O081,O089,O090,  
..... O092,BS07,BS14,CS40,  
..... CS49,EPH10,EPH11,SS27  
Larouche A ..... O081  
Larsen G. .... CS24  
Larsson J. .... CPR30  
Lau C ..... EPH24  
Lau E ..... CS50  
Lauffenburger D. .... O005,O006  
Lauridsen-Hoegh P ..... SS76  
Lauscher D. .... O115,CPR20  
Lavigne P ..... O025  
Lavoie F ..... SS49  
Lavoie S ..... O018,CS04,CS60  
Lawless M. .... O072  
Lazarus L. .... O071,O112,EPH76  
Le AQ ..... O084,BS19  
Le Campion A. .... O081,BS07  
LeBlanc M-A. .... SS32,SS36  
LeBlanc R. .... CS29  
Lebouché B ..... BS11,CS40,CS29  
Leclerc P. .... O042,EPH08,EPH19  
Lee C ..... SS34  
Lee GQ. .... BS20,CS16  
Lee M. .... O038  
Lee T ..... O089,O090,EPH10,EPH11  
Lee-Foon N ..... O055  
Lees R. .... SS23,SS24  
Legault D. .... O018  
Legault M. .... CS29  
Lemick R ..... EPH86  
Lemire B. .... CS27,SS48  
Leonard LE. .... SS65,SS67  
Lepik KJ ..... CS54

- Lero D ..... CPR25  
 Lester R ..... EPH29  
 Lester RT ..... O099  
 Letendre S ..... CS35  
 Lewis J ..... SS30  
 Li A ..... O116,CS58,CS59,SS35  
 Li AT ..... CPR22,SS25  
 Li E ..... CS17  
 Li J ..... EPH57  
 Li N ..... SS81  
 Li Q ..... O088,BS33  
 Liang B ..... BS33  
 Liang C ..... BS43  
 Liang RH ..... O082  
 Lichtenstein K ..... CS19  
 Liddy C ..... EPH82  
 Liebenberg L ..... O005,O012,O065,  
 ..... O101,CS01,EPH43  
 Liles WC ..... O040  
 Lilley S ..... O070  
 Lima V ..... O035,O104  
 Lima VD ..... CS53,CS62  
 Lindsay J ..... CS41  
 Lingwood CA ..... BS53  
 Lisovsky I ..... BS11  
 Liu J ..... O037,EPH45  
 Liu Y ..... BS16,BS31  
 Liu Z ..... BS43,BS44  
 Lo C ..... O093  
 Lobritz M ..... O085  
 Lofters A ..... O039  
 Logie C ..... O024,O072,EPH74,CPR36  
 Logie CH ..... O055,SS58  
 Longpré D ..... O018,CS04,CS60  
 Lopez Torres R ..... CPR03  
 Lotimer S ..... EPH79  
 Louch D ..... CS50  
 Louie M ..... SS04  
 Lourenco L ..... CS53  
 Loutfy M ..... O012,O038,O039,O066,  
 ..... O082,O093,O094,O101,O103,  
 ..... CS01,CS02,CS08,CS09,CS43,CS55,  
 ..... CS56,CS63,EPH04,EPH12,EPH34,  
 ..... EPH43,EPH45,EPH53,EPH77,  
 ..... SS30,CPR36  
 Loutfy MR ..... O037,O095,O113  
 ..... EPH13,EPH85  
 Lu S ..... BS30  
 Lu W ..... CS29,O064  
 Lucas P ..... O100  
 Luo M ..... O088,BS18,BS33  
 Lusaka Z ..... SS77  
 Luu HA ..... BS28  
 Luyombya H ..... SS25  
 Lévy JJ ..... O078  
 Lyaruu T ..... CPR35  
 Lynch T ..... O082,CS62  
 Lyons T ..... O109,SS54
- M**
- Ma A ..... BS28  
 Maan EJ ..... BS02  
 MacDonald J-A ..... O071,O112,EPH76  
 MacDougall G ..... CS50  
 MacGillivray J ..... CS45  
 MacHattie A ..... O115,SS43  
 Machouf N ..... O018,O082,CS02,CS04,  
 ..... CS08,CS55,CS56,CS60,  
 ..... EPH13,EPH77  
 MacIsaac C ..... O112,CPR17  
 MacKenzie LJ ..... CS53,CS54  
 MacLachlan D ..... O021  
 MacLean R ..... CPR23  
 MacMillan DR ..... O084  
 MacPherson D ..... EPH28  
 MacPherson P ..... O003,BS12,CS22  
 MacPherson PA ..... EPH39  
 MacTavish JK ..... CPR26  
 MacTavish JK ..... CPR27  
 Mahan M ..... CPR28  
 Maher L ..... SS61  
 Maimbolwa M ..... O080  
 Maitland D ..... SS25  
 Majumdar B ..... O054,SS83  
 Makoroka L ..... CPR30  
 Makowicki J ..... CS52  
 Makuwaza T ..... SS23,SS24  
 Malamba S ..... O015,EPH05  
 Mann JF ..... CS30  
 Manno M ..... EPH79  
 Manuel-Smith C ..... CPR35  
 Marcotte T ..... O007,CS34  
 Margolese S ..... CS41  
 Margot N ..... CS14  
 Markowitz M ..... O084  
 Marotta P ..... CS25  
 Marshall Z ..... O071,O076,O112,  
 ..... EPH76,EPH82,SS22  
 Martel D ..... SS48  
 Martel M ..... SS06  
 Martin JN ..... BS20  
 Martin S ..... O047  
 Martinez CJ ..... CPR26,CPR27  
 Martinez JL ..... EPH25,EPH30  
 Martinez-Cajas J ..... EPH73  
 Martinez-Cajas JL ..... EPH31  
 Masching R ..... O051,CS02,CS55,  
 ..... CS56,EPH53,SS01,CPR04  
 Masson L ..... O005  
 Matejcic A ..... CPR19  
 Mathieu-Chartier S ..... O074  
 Maticka-Tyndale E ..... O052,O053,SS69  
 Matsukura M ..... EPH50  
 Matzinger M ..... O091  
 Maurais E ..... CS61,EPH24  
 Maxwell J ..... O116,CS58,CS59,EPH39,  
 ..... SS08,SS37  
 Mayer K ..... O084  
 Mayo N ..... CS35  
 Mayo NE ..... CS32,EPH48  
 Mazzulli T ..... O087,CS20,EPH06,EPH39  
 Mbuagbaw L ..... O099  
 McAllister R ..... O026  
 McCall J ..... SS76  
 McCallister S ..... CS14  
 McCandless L ..... EPH49  
 McCarthy SD ..... BS42,BS59  
 McClarty L ..... O014  
 McClarty LM ..... EPH37,EPH40,EPH51  
 McCloskey R ..... O082,O084,BS19  
 McCorrister S ..... O005,O006  
 McCready L ..... O072  
 McCullagh J ..... CPR30  
 McCully ME ..... BS30  
 McDougall P ..... O045,O115,  
 ..... EPH22,EPH26,  
 ..... SS20,SS43,SS59,CPR20  
 McEwen O ..... O108,CS22,EPH39  
 McGee F ..... O012,O101,CS01,  
 ..... CS20,EPH06,EPH15  
 McGovern RA ..... BS21  
 McHutchison J ..... O033  
 McIntosh M ..... EPH60,SS40  
 McKenzie C ..... SS51  
 McKinnon L ..... O005  
 McLinden T ..... SS26  
 McNaughton N ..... SS23,SS24  
 McNeil R ..... O105,EPH26,SS20,SS61  
 McTavish E ..... EPH79  
 McWatt S ..... O075,CS65  
 Medeiros P ..... SS44  
 Medina C ..... SS19  
 Medjuck M ..... SS52,SS53,SS71  
 Mehraj V ..... O009,O064,BS13,CS29  
 Mehta S ..... CS15  
 Meili R ..... CPR07  
 Mejia P ..... CS61  
 Melendez-Peña CE ..... BS39  
 Melnychuk L ..... BS23  
 Menon A ..... O080  
 Mesplède T ..... BS31  
 Mesplède TR ..... BS34  
 Mesplede T ..... BS24,BS25  
 Messina J ..... CPR01  
 Michelow W ..... O047  
 Micollier E ..... O056  
 Mihan R ..... O052,O053  
 Mikiki M ..... SS22  
 Miles S ..... O103,EPH83  
 Mill J ..... SS68  
 Miller CL ..... O063,CS06  
 Miller M ..... BS16,CS14  
 Miller SC ..... O060  
 Milloy MJ ..... O084  
 Milloy M-J ..... O106,BS19,SS61  
 Millson P ..... O013,O103,EPH20,EPH78,SS22  
 Ming L ..... O058,O059,BS45,BS53  
 Mishra S ..... EPH01,EPH39  
 Miskovic M ..... EPH46  
 Mocello AR ..... BS20  
 MODES Research Team ..... EPH36,EPH51  
 Modir H ..... EPH82  
 Moffat J ..... BS48  
 Moghadam A ..... CS24  
 Mohammadi H ..... CS39,CS44  
 Moisi D ..... O038,O089,BS31,EPH10,EPH11  
 Money DM ..... O081,O090,O096,BS02  
 Monson CM ..... O108  
 Montaner J ..... O011,O035,CS02,CS08,  
 ..... CS24,CS55,CS56,EPH77,  
 ..... SS56,SS57  
 Montaner JS ..... O082,O104,O106,  
 ..... CS53,CS54,EPH03,  
 ..... EPH13,EPH17,EPH63  
 Montano D ..... EPH30,EPH31,EPH73  
 Monteiro P ..... BS15  
 Monteith K ..... CPR01,SS06,SS16  
 Moodie EE ..... O017  
 Moore D ..... O020,O046,O104,CS21,  
 ..... EPH17,EPH49,EPH59,EPH63  
 Moore DM ..... EPH02,EPH18,SS41  
 Moqueet N ..... O034  
 Morales Miranda S ..... EPH71  
 Moran-Bonilla L ..... EPH27  
 Moravan V ..... CS20  
 More Than Fiction Team, The ..... O117  
 Moreheart S ..... EPH35

Morin G..... O078  
Morissette C..... EPH08,EPH19  
Morshed M..... CPR36  
Moses E..... O038  
Mouhamad S..... BS38  
Moukambi F..... O031  
Moulard A..... O030  
Måsse LC..... SS81  
Métras M-E..... O092  
Muchenje M..... O095,CS41,SS73,CPR22  
Mueller K..... O087  
Mueses HF..... EPH73,EPH31  
Mugenyi P..... CS15  
Mujib S..... O058  
Muldoon K..... EPH72  
Muldoon KA..... O016,O070,EPH14  
Mungai J..... O086  
Murooka T..... O027  
Murphy A..... CPR10  
Murphy C..... CS34  
Murphy D..... CS04,CS60  
Murphy K..... O094,EPH62  
Murphy P..... CS57  
Murray J..... O012,EPH15,EPH39,SS35  
Mursleen S..... O099  
Murzin K..... SS45,CPR29  
Muthumani K..... BS27  
Muyinda H..... O015,EPH05  
Muzaaya G..... EPH14,EPH72  
Mwalwanda M..... CS41  
Mwamba C..... O080  
Mwangi L..... O086  
Mweshi M..... SS77  
Mwimanzi P..... O060  
Myers T..... EPH45  
Mykhalovskiy E..... O098

## N

Naccarato M..... CS10  
Naggie S..... O033  
Nam S..... CS31  
Nankya I..... O085,BS52,CS15  
Nantamu PD..... CS51  
Narushima M..... CPR05  
Nasewich S..... O102  
Nash D..... EPH49  
Navia D..... SS58  
Ndashimye E..... CS15  
Ndlovu U..... SS24  
Newman PA..... O024,EPH74  
Newman R..... SS40  
Ng R..... CS63  
Nguyen P..... O043,O106,EPH57,SS57  
Nguyen T..... O082,BS21  
Ni X..... BS14  
Nicholson V..... O066,CS02,EPH04,  
..... EPH12,EPH34,EPH53  
Nicholson VJ..... SS16  
Nickel G..... O085  
Nieva JL..... BS30  
Nixon S..... O067,O080,CS64,SS77  
Nixon SA..... O051  
Njoki J..... O001  
Nkandu EM..... SS77  
Nobis T..... O050,CS55,CS56,EPH53,SS15  
Nohpal A..... O104,EPH12,EPH34  
Nomellini JF..... O057  
Noor S..... CS58,CS59,SS31  
Noor SW..... O023,EPH66,EPH67

Nosyk B..... CS08,EPH77  
Novak R..... O006  
Nowgesic E..... CS55,CS56,EPH53  
Numer M..... O079,EPH76,SS11  
Nyanga B..... O005  
Nykoluk M..... BS33  
Nyman S..... SS01,CPR04

## O

O'Brien K..... EPH43,SS19  
O'Brien KK..... O067,CS64  
O'Brien N..... O066,O113,EPH04  
O'Brien Teengs D..... CS02,CS55,CS56,  
..... EPH53,SS42  
O'Hara S..... BS27  
O'Leary T..... O075,CS65  
O'Neill T..... CS66  
Odger AR..... SS12  
Odong P..... O015,EPH05  
Ogilvie G..... O038,SS56,SS81  
Ogunnaike-Cooke S..... O042,EPH21  
Ogwang M..... O015,EPH05  
OHTN Cohort Study Team,  
For the ..... O101,CS20,EPH43  
Okidi C..... SS77  
Oliveira M..... BS24,BS31  
Oliveira N..... EPH02,EPH26,EPH49,SS59  
Oliver B..... O118  
Olsen C..... EPH82  
Olvera A..... O083  
Omollo KO..... O001  
Omorodion F..... O052,O053,SS69  
Oneka A..... O015,EPH05  
Ongoiba F..... O095,SS73  
Opapo K..... SS77  
Opondo J..... O097  
Osborne C..... EPH49,SS16,CPR20  
Ostrowski M..... O008  
Ostrowski MA..... BS53  
Otis J..... O019,O041,O074,  
..... O078,CS40,EPH41,  
..... SS06,SS27,SS37  
Ouellet M..... O004  
Owino M..... SS73  
Oyugi J..... O001,O086

## P

Paddock S..... SS23,SS24  
Pagarigan H..... CS12  
Pai NP..... EPH31  
Palangi A..... EPH54  
Palazzo A..... BS16  
Pan Q..... BS43  
Pang KM..... BS39  
Pang P..... O033  
Paparisto E..... O026  
Papp E..... O094,CS39,CS44  
Paradis G..... SS26  
Parashar S..... CS06,EPH03,EPH26,  
..... EPH49,SS20,SS59,  
..... CPR20,CPR24  
Park-Wyllie L..... EPH83  
Parmar P..... O003  
Parry R..... O107  
Passmore J-A..... O005  
Patel AR..... O099  
Patel S..... O015,EPH05  
Patey S..... O103  
Patocs A..... CS31,CS33,CS34

Patten S..... SS32,SS36,CPR32  
Patterson M..... SS81  
Patterson S..... EPH13  
Patterson SE..... O106  
Patton K..... SS07,SS60  
Paul P..... CPR04,SS01  
Paul (Xele'milh) D..... CS02,EPH53  
Pauly B..... EPH26,EPH28,  
..... SS55,SS59  
Pavlova D..... EPH01,EPH37,EPH40  
Pawlak EN..... BS37,BS46  
Payne HM..... O045,SS43  
Pearce ME..... O015,O044,O049,  
..... EPH05,EPH29,  
..... SS04,SS05  
Peddle S..... O112,CPR22,CPR32  
Peltekian K..... CS25  
Pelude L..... SS65,SS67  
Peng L..... O056  
Penn R..... SS66  
Penney G..... CPR23  
Pexos C..... O082  
Pextos C..... O064  
Phillips P..... O011  
Pick N..... O038  
Pierre L..... O109,SS54  
Pierre PL..... EPH62  
Pierre-Pierre V..... O052,O053,SS69,SS73  
Pillet S..... BS33  
Pilon R..... BS33  
Piquette-Miller M..... BS55,BS58  
Pitman B..... EPH47  
Pittman E..... CS17  
Placido T..... CS57  
Plant B..... CPR13  
Platt RW..... O034  
Plummer F..... O088,BS18,BS33  
Poliquin M..... CS25,O018  
Pollock J..... CPR12  
Poon A..... BS21  
Poon AF..... O082,O084,BS19,CS16  
Poon K..... SS25  
Poon M..... SS35,CPR05  
Pooyak S..... SS05  
Porch W..... O118  
Porter M..... SS42  
Posso-Suarez J..... EPH73  
Post F..... CS19  
Potter M..... CS61  
Poulin C..... EPH09  
Powell L..... EPH62,SS40  
Power C..... O007  
Pozniak A..... CS19  
Prego C..... BS33  
Price C..... EPH43  
Price R..... CS02,EPH53  
Pringle JI..... EPH32  
Proctor-Simms M..... O112,EPH76,CPR17  
Project Rock Research Team, The.....  
..... SS65,SS67  
Proulx-Boucher K..... O066,O078,O113,  
..... CS40,EPH04,EPH12,SS27  
Pugh D..... EPH60,EPH62,SS40  
Puskas CM..... O063,CS06

## Q

Quashie P..... BS31  
Quinones-Mateu M..... CS15



## R

Rabeanahary H. .... O031  
 Raboud J. .... O012,O038,O039,O082,  
 .... O101,O103,CS01,CS02,CS07,  
 .... CS08,CS09,CS20,CS22,CS55,  
 .... CS56,CS63,CS66,EPH06,EPH39,  
 .... EPH43,EPH53,EPH77,EPH83  
 Raboud JM. .... O040,CS36,EPH13  
 Rachlis A. .... O007,O012,O017,  
 .... CS01,CS02,CS22,CS34,  
 .... CS55,CS56,CS66,EPH13,  
 .... EPH39,SS23,SS24  
 Rachlis B. .... O101  
 Racicot C. .... SS27  
 Racine G. .... O031  
 Rai B. .... EPH32  
 Raissi SE. .... O068  
 Ramgopal M. .... CS19  
 Rampakakis E. .... CS25  
 Ramsaroop C. .... CPR05  
 Ramsay H. .... O055  
 Rance E. .... BS39  
 Ranganath N. .... BS49,O062  
 Ranville F. .... CS02,EPH53,SS20  
 Rashidi B. .... O036  
 Ratcliff A. .... O085  
 Ray A. .... BS16  
 Raymond-Marchand L. .... BS07  
 Read S. .... BS26,CS48,CS50  
 Redman N. .... EPH65  
 Reeder BA. .... O097  
 Regier D. .... EPH83  
 Regier DA. .... O095  
 Rekart M. .... O107  
 Remis RS. .... EPH45  
 Renaud C. .... CS49  
 Renner TM. .... BS47  
 Rennie M. .... CS44  
 Reschny JA. .... SS64,CPR09  
 Restoule J-P. .... SS47  
 Rice J. .... CPR12  
 Rich A. .... O020,O046,EPH02,  
 .... EPH17,EPH18,EPH59,  
 .... EPH63,SS41  
 Richardson L. .... O105  
 Richmond M. .... BS18  
 Rivas C. .... EPH67  
 Robert J. .... CS25  
 Robinette J. .... EPH45  
 Robinson G. .... O067  
 Robinson J. .... CS42,CS47  
 Robinson L. .... SS48  
 Robinson LJ. .... CS18  
 Robinson S. .... EPH46,SS21  
 Robitaille L. .... O031  
 Rocha Jimenez T. .... EPH71  
 Rodger D. .... O102,CS13  
 Rodrigue C. .... O019,CS40  
 Rodrigues V. .... O031,BS38  
 Roger M. .... O041  
 Rogers T. .... CPR13,CPR14,CPR15,CPR16  
 Rohailla S. .... EPH22  
 Rollet-Kurhajec KC. .... O017  
 Rollins R. .... CPR26,CPR27  
 Romas L. .... O005  
 Rosenes R. .... O007,CS22  
 Rosenfeld P. .... BS48  
 Rossi C. .... O017  
 Rossi JJ. .... BS39  
 Roth E. .... O046,EPH17,EPH59,EPH63  
 Roth EA. .... O020,EPH02,EPH18,SS41  
 Roungrakphon S. .... EPH74  
 Rourke S. .... O082,O098,O101,CS01,  
 .... CS02,CS31,CS33,CS55,CS56,  
 .... CS63,EPH43,EPH58,EPH82,  
 .... SS19,SS75,CPR19  
 Rourke SB. .... O007,O012,O077,  
 .... CS20,CS34,CS66,  
 .... EPH06,EPH13,EPH39,  
 .... SS16,SS26,CPR01  
 Rousseau R. .... O008,O019,EPH39,SS06,SS37  
 Routy J-P. .... O002,O009,O064,O041,  
 .... BS03,BS11,BS13,BS15,  
 .... BS32,BS51,CS27,CS29  
 Roy E. .... EPH19,EPH33  
 Roy É. .... EPH08,SS63  
 Rubincam C. .... O024  
 Rueda S. .... CS66,EPH43,EPH58  
 Rujas E. .... BS30  
 Ryan S. .... O055,SS73

## S

Saag M. .... O033  
 Saberi S. .... BS02  
 Safford H. .... CPR24  
 Sahajpal R. .... O010  
 Sainsbury J. .... O088  
 Saint-Germain J. .... O025  
 Sakovych O. .... EPH37,EPH40  
 Salata R. .... CS15  
 Salit I. .... CS22,EPH39  
 Salters K. .... EPH03,EPH34,SS59  
 Salters KA. .... O063,CS06  
 Samarani S. .... BS03  
 Samji H. .... O104,CS02,CS53,CS54,  
 .... EPH13,EPH26,EPH49  
 Samson J. .... O078,CS40,SS27  
 Samson L. .... O016,O089,O091,O114,EPH11  
 Samson LM. .... O090  
 Sanandaji M. .... O095  
 Sanche S. .... CS08,EPH77  
 Sanchez Vidales MDM. .... BS54  
 Sandstrom P. .... BS33  
 Sandstrom PA. .... BS31  
 Sandstrom TS. .... O062,BS49  
 Sangam G. .... SS52,SS53,SS71  
 Santosuosso B. .... SS80  
 Saththa B. .... BS02,BS09,BS10  
 Sauve L. .... O089,O090,EPH11  
 Sauve LJ. .... EPH10  
 Sazonova Y. .... EPH37,EPH40  
 Scarborough RJ. .... BS39  
 Schechter MT. .... O015,O044,O049,O084,  
 .... EPH05,EPH29,SS04,SS05  
 Scheim AI. .... EPH65,SS22  
 Schwandt M. .... O097  
 Scott JK. .... BS30  
 Scott K. .... SS41  
 Scott S. .... CS35,SS46  
 Scully L. .... CS25  
 Seatter E. .... SS52,SS53,SS71  
 Sehra R. .... CS48  
 Seidu F. .... CPR35  
 Senik A. .... BS38,BS38  
 Sereda P. .... O020,O035,O046,O066,O104,  
 .... EPH02,EPH04,EPH12,EPH18,  
 .... EPH34,EPH59,EPH63,SS41  
 Serghides L. .... O094,CS39,CS44,EPH85  
 Serhir B. .... EPH08,EPH19  
 Severini A. .... CS22  
 Shah R. .... O094,CS45  
 Shahabi K. .... O005,O008  
 Shahid A. .... O060,O083  
 Shahin R. .... O098  
 Shahram SZ. .... SS04  
 Shannon B. .... O040  
 Shannon K. .... O109,O043,EPH14,  
 .... EPH57,EPH72,SS54,SS56,SS57  
 Shapiro H. .... O093  
 Sharma M. .... SS23,SS24  
 Sharma R. .... SS05  
 Sharma S. .... O036,CS11,CS12,CS23,CPR17  
 Sharp A. .... CS57  
 Sharvendiran R. .... CPR06  
 Shattock R. .... O085  
 Shaw S. .... EPH36  
 Shaw SY. .... O014,EPH51  
 Sheehan N. .... BS32,SS48  
 Shen D. .... BS48  
 Sherpa CD. .... O117  
 Shi M. .... O077  
 Shindler S. .... SS42  
 Shopin D. .... EPH50  
 Shoveller J. .... O073,EPH57,SS56  
 Shuper P. .... EPH58  
 Shurgold J. .... SS65,SS67  
 Shurgold S. .... O082  
 Siemieniuk RA. .... O068,CS57  
 Silverbrook M. .... CS34  
 Silverman JG. .... EPH71  
 Silvestre R. .... BS38  
 Silvestri G. .... BS38  
 Simwaba P. .... O080  
 Sinck L. .... BS39  
 Sinclair C. .... EPH28  
 Sinding C. .... O056  
 Singer J. .... O038,O089,O090,CS26,  
 .... EPH10,EPH11  
 Singh A. .... CS42  
 Singh J. .... BS26  
 Singhroy DN. .... BS34  
 Sinyinza R. .... O080  
 Siou K. .... CPR28  
 Sivachandran N. .... CS57  
 Sivagnanasunderam B. .... EPH68,EPH69,  
 .... EPH70  
 Siwale M. .... O080  
 Sled J. .... CS44  
 Sloan K. .... CS52  
 Smail F. .... O038  
 Small W. .... O073,O105,SS54,SS61  
 Smit J. .... O057  
 Smith D. .... EPH38  
 Smith G. .... O037,EPH45  
 Smith ML. .... CS48  
 Sodora D. .... BS04  
 Solomon P. .... O067,O080,CS67  
 Song R. .... BS11  
 Soon C. .... SS07,SS60  
 Sota T. .... CS34  
 Sou J. .... EPH57  
 Soudeyns H. .... O081,O096,BS07,BS14  
 Souleymanov R. .... O021,O022,EPH61,  
 .... SS13,SS22  
 Soundaramourty C. .... O031  
 Spaans J. .... O016

Speakman ER . . . . .SS72  
Spira B . . . . .BS34  
Spittal P . . . . .SS05  
Spittal PM . . . . .O015,O044,O049,  
. . . . .EPH05,EPH29,SS04  
Stadnyk M . . . . .CS42  
Stalker A . . . . .BS05  
Stamm L . . . . .O033  
Stark LB . . . . .O070  
Stein N . . . . .SS73  
Steinberg M . . . . .O107  
Stephenson K . . . . .EPH17,EPH18  
Stewart A . . . . .O075,CS65  
Stilla AM . . . . .BS50  
Stoilov P . . . . .O058,O059  
Stone S . . . . .O038  
Stonechild S . . . . .SS01,CPR04  
Strathdee S . . . . .EPH57  
Stratkova D . . . . .O029  
Striffler L . . . . .EPH04  
Strike C . . . . .EPH26,EPH46,EPH52,  
. . . . .SS21,SS66  
Strike CJ . . . . .EPH83  
Stuber M . . . . .CS13  
Su R-C . . . . .BS08  
Sugden S . . . . .O003  
Sulkowski M . . . . .O033  
Sulz L . . . . .SS48  
Summers M . . . . .SS52,SS53,SS71  
SurvUDI Working Group, The . . . . .EPH19  
Susan S . . . . .CPR01  
Sutdhibhasilp N . . . . .SS35,CPR05  
Sutradhar R . . . . .O103  
Sweankambo N . . . . .EPH05,O015  
Swenson L . . . . .CS62  
Switzer S . . . . .SS21,CPR35  
Szabo E . . . . .CS36  
Szadkowski L . . . . .O040,CS07,CS08,CS36

## T

Tahmasebi S . . . . .CS12,O036  
Tai JW . . . . .EPH86  
Tam J . . . . .CS50  
Tan D . . . . .CS22,O038  
Tan DH . . . . .O040,O116,CS10,CS20,CS36,  
. . . . .CS58,CS59,EPH06,EPH39,SS08  
Tang D . . . . .BS33  
Tangsubutra R . . . . .CPR05  
Tanveer F . . . . .CPR12  
Tarasuk J . . . . .O042  
Tatham C . . . . .CPR20  
Tattle S . . . . .O067,O080,SS45,SS77  
Taylor D . . . . .SS81  
Taylor J . . . . .BS19  
Taylor M . . . . .EPH16  
Tebere L . . . . .O015  
Tello-Bolivar IC . . . . .EPH73  
Tep T-S . . . . .BS51  
Tepjan S . . . . .EPH74  
Terpstra A . . . . .SS19  
Tsfamichael A . . . . .O065  
Tharao W . . . . .O095,O113,CS41,SS73,CPR36  
Thede G . . . . .BS28  
Thomas KD . . . . .SS46  
Thomas R . . . . .O018,CS04,CS29,CS60  
Thomas V . . . . .EPH29  
Thomas-Pavanel J . . . . .O066,O113,  
. . . . .EPH04,EPH12

Thorne A . . . . .CS26  
Thorne J . . . . .SS23,SS24  
Thériault J . . . . .O078  
Thumath M . . . . .EPH18  
Tietjen I . . . . .O060  
Timothy RK . . . . .SS70  
Tinnmouth J . . . . .O037,CS22,CS66  
Tjernlund A . . . . .O088  
Tom S . . . . .O026  
Tomas K . . . . .EPH21  
Tooley L . . . . .O047  
Toronto ON . . . . .SS77  
Torresilla C . . . . .BS44  
Tossonian H . . . . .O036,CS11,CS12,CS23  
Toy J . . . . .SS48  
Trahan M-J . . . . .O092  
Travers R . . . . .O052,O053,EPH65,SS69  
Tremblay C . . . . .O009,O069,BS03,  
. . . . .CS29,EPH24  
Tremblay MJ . . . . .O004,O087  
Tremblay-McLean A . . . . .BS11,BS14  
Trottier B . . . . .O018,CS04,CS60  
Trottier G . . . . .O078  
Trottier S . . . . .O038  
Trussler T . . . . .CPR18  
Tseng A . . . . .CS09  
Tsoukas C . . . . .O082,CS02,CS08,CS55,  
. . . . .CS56,EPH13,EPH77  
Tuff J . . . . .BS33  
Tulloch TG . . . . .EPH66,EPH68,EPH69,EPH70  
Tupper K . . . . .EPH28  
Turner K . . . . .EPH16  
Tuscano HJ . . . . .CPR12  
Tyler S . . . . .BS33  
Tynan A-M . . . . .CS64,CPR21

## U

Ubdegrove C . . . . .CPR26,CPR27  
Udayasekaran D . . . . .O072  
Underhill AA . . . . .SS30  
Unger D . . . . .SS76  
Urquia M . . . . .CS45  
Utama R . . . . .SS35

## V

Vahabi M . . . . .SS50,CPR05  
Vahedi F . . . . .O087  
Vajravelu S . . . . .CS67  
Valois S . . . . .BS14,CS49  
Van Borek N . . . . .SS81  
Van Caesele P . . . . .O014  
Van Nynatten L . . . . .BS37  
Van Schalkwyk J . . . . .BS02  
Vandermeersch J . . . . .EPH33  
Vankoeverden P . . . . .CPR05  
Vannice SE . . . . .SS65,SS67  
Vattikonda N . . . . .SS83  
Vattikonda NK . . . . .O054  
Vaudry W . . . . .O089,O090,CS42,  
. . . . .EPH10,EPH11  
Veillette-Bourbeau L . . . . .O019,SS37  
Venner CM . . . . .BS52  
Vernon J . . . . .SS31  
Vijayanathan H . . . . .CPR28  
Vlahaki E . . . . .CPR11  
Von Bischoffshausen O . . . . .CPR24  
Vyboh K . . . . .O002,O009,O064  
. . . . .BS13,BS32,CS27,CS29  
Vézina S . . . . .O018

## W

Wacliche VS . . . . .BS15,BS51  
Wagner AC . . . . .O108  
Wagner T . . . . .O084  
Wainberg M . . . . .O041,BS25  
Wainberg MA . . . . .O019,BS23,BS24,  
. . . . .BS31,BS34  
Walach C . . . . .CS57  
Walker BD . . . . .O084  
Walker G . . . . .SS73  
Walker M . . . . .O016  
Walmsley S . . . . .O017,O034,O038,O040,O094,  
. . . . .CS01,CS07,CS08,CS09,  
. . . . .CS36,EPH39,SS26  
Walsh T . . . . .CS55,CS56,EPH53  
Walsh Z . . . . .O100  
Wang D . . . . .BS28  
Wang S . . . . .BS30  
Wang S-NT . . . . .EPH79  
Wang X . . . . .O030  
Wang Z . . . . .BS43  
Wardell NG . . . . .O110  
Watson J . . . . .CPR19  
Watson TM . . . . .EPH46,EPH52,SS66  
Weaver J . . . . .EPH74,SS58  
Webster K . . . . .SS16  
Wedgwood OM . . . . .BS16,CS19  
Wei W . . . . .O056  
Wertheimer S . . . . .O113  
Wessells MG . . . . .O070  
Westmacott G . . . . .O005,O006  
Wexler D . . . . .O047  
Wheeler KM . . . . .O065  
White S . . . . .O013,EPH20,SS02  
White SJ . . . . .EPH78  
Whitebird W . . . . .CS55,CS56,EPH53  
Wijewardena C . . . . .O058,BS36  
Wild TC . . . . .EPH16,EPH28  
Wilhelm E . . . . .O025,O028  
Wille PT . . . . .CS30  
Wilson C . . . . .O111,SS47  
Wilson LA . . . . .SS65,SS67  
Wilton J . . . . .O047,O116,CS58,CS59,SS08  
Witt-Sullivan H . . . . .CS25  
Wobeser W . . . . .O012,O038  
Wobeser WL . . . . .EPH79  
Wong A . . . . .O082,O102,CS08,CS13,  
. . . . .EPH77,SS48  
Wong G . . . . .BS33  
Wong H . . . . .CS02,CS21,EPH13  
Wong J . . . . .EPH02,EPH26,SS35,SS50  
Wong JH . . . . .SS59  
Wong JP . . . . .SS25  
Wong JP-H . . . . .CPR05  
Wong Q . . . . .CS36  
Wong RW . . . . .O058,O059,BS53  
Wong S . . . . .EPH02  
Wong Z-W . . . . .EPH16  
Wood E . . . . .EPH80,SS61  
Woods C . . . . .BS19  
Woods CK . . . . .O082,BS21  
Worthington C . . . . .O067,O103,O118,EPH26,  
. . . . .SS19,SS22,SS59,SS75  
Wright J . . . . .O097  
Wu C . . . . .BS57  
Wylie J . . . . .EPH31  
Wylie JL . . . . .O014

## Index des auteurs

### X

Xia Y. .... BS28  
Xiao Y. .... BS44

### Y

Yang J. .... O033  
Yao X. .... O030,EPH21  
Yates T. .... O067,O080,SS77  
Yates TC. .... CPR25  
Yi TJ. .... O040  
Yin WC. .... BS48  
Yip B. .... O011,CS24,CS53,CS54  
Yuong D. .... CS10

Yorke J. .... CPR18  
Young I. .... O047  
Young SK. .... EPH35  
Younger J. .... CS55,CS56,EPH53  
Yu B. .... O014  
Yu L. .... CS44  
Yu N. .... EPH36  
Yuan X-Y. .... BS33  
Yuan Z. .... BS33,O088  
Yudin M. .... O093,O094  
Yudin MH. .... CS45,EPH85  
Yuen T. .... CS35,EPH04

### Z

Zagrodney K. .... EPH04  
Zaharatos GJ. .... BS23  
Zhang W. .... O035,O063,O066,  
..... CS21,CS24,CS53,CS54,  
..... EPH04,SS41  
Zhou R. .... O054  
Zhou YR. .... O056,SS83  
Zhu J. .... CS06,EPH13  
Zoccole A. .... O050,CS55,CS56,  
..... EPH53,SS15  
Zúñiga-Pflücker JC. .... BS26

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## CALENDAR OF EVENTS

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**April 16-18, Charlottetown, Prince Edward Island:** AMMI Canada – CACMID Annual Conference 2015. Contact AMMI Canada, 192 Bank Street, Ottawa, Ontario K2P 1W8. Telephone 613-260-3233, fax 613-260-3235, e-mail [info@ammi.ca](mailto:info@ammi.ca), website [www.ammi.ca](http://www.ammi.ca)

**May 26-29, Toronto, Ontario:** 2015 Annual Canadian Society for Pharmaceutical Sciences Conference. Contact the Canadian Society for Pharmaceutical Sciences, Room 2-020L, Katz Group Centre for Pharmacy & Health Research, 11361 – 87 Avenue, University of Alberta, Edmonton, Alberta T6G 2E1. Telephone 780-492-0950, fax 780-492-0951, e-mail [bberekoff@cspscanada.org](mailto:bberekoff@cspscanada.org), website [www.cspscanada.org](http://www.cspscanada.org)

**May 28-30, Quebec City, Quebec:** 21st Canadian Connective Tissue Conference 2015. Contact Dr Boris Hinz (Secretary), University of Toronto, Room 234, Fitzgerald Building, 150 College Street, Toronto, Ontario M5S 3E2. Telephone 416-978-8728, fax 416-978-5956, e-mail [boris.hinz@utoronto.ca](mailto:boris.hinz@utoronto.ca), website <http://connective-tissue-canada.com/>

**May 30-June 3, Edmonton, Alberta:** Canadian Association of Emergency Physicians 2015 Annual Conference. Contact the Canadian Association of Emergency Physicians, 180 Elgin Street, Suite 808, Ottawa, Ontario K2P 2K3. Telephone 613-523-3343, fax 613-523-0190, e-mail [admin@caep.ca](mailto:admin@caep.ca), website <http://caep.ca>

**May 30-June 2, New Orleans, Louisiana:** 115th General Meeting of the American Society for Microbiology. Contact the American Society for Microbiology, 1752 N Street Northwest, Washington, DC 20036-2904, USA. Telephone 202-737-3600, e-mail [generalmeeting@asmusa.org](mailto:generalmeeting@asmusa.org), website <http://gm.asm.org/>

**June 1-4, Toronto, Ontario:** 2015 Canadian Society for Epidemiology and Biostatistics Conference. Contact Sally Cleford, Face2Face Events. E-mail [secretariat@cseb.ca](mailto:secretariat@cseb.ca), website <http://cseb.ca>

**June 4-7, Winnipeg, Manitoba:** 28th Annual Canadian Society for Immunology Conference. Contact the Canadian Society for Immunology, Lori Coulthurst. E-mail [info@csi-sci.ca](mailto:info@csi-sci.ca), website [www.csi-sci.ca](http://www.csi-sci.ca)

**June 14-17, Victoria, British Columbia:** Infection Prevention And Control Canada 2015 National Education Conference. Contact Infection Prevention And Control Canada Conference Office, PO Box 46125, RPO Westdale, Winnipeg, Manitoba R3R 3S3. Telephone 204-897-5990, fax 204-895-9595, e-mail [info@ipac-canada.org](mailto:info@ipac-canada.org), website [www.ipac-canada.org](http://www.ipac-canada.org)

**June 15-18, Regina, Saskatchewan:** Canadian Society of Microbiologists 65th Annual Conference. Contact the Canadian Society of Microbiologists Secretariat, 17 Dossetter Way, Ottawa, Ontario K1G 4S3. Telephone 613-421-7229, fax 613-421-9811, e-mail [info@csm-scm.org](mailto:info@csm-scm.org), website [www.csm-scm.org](http://www.csm-scm.org)

**June 23-25, Budapest, Hungary:** International Scientific Conference on Probiotics and Prebiotics 2015. Contact the Organizing Secretariat, PAMIDA International Ltd, Komenského 1337, Kysucké Nové Mesto, Slovak Republic, 024 01. Telephone 421-917-957-393, e-mail [info@probiotic-conference.net](mailto:info@probiotic-conference.net), website [www.probiotic-conference.net](http://www.probiotic-conference.net)

**June 24-27, Stockholm, Sweden:** International Society for Stem Cell Research 2015 Annual Meeting. Contact the International Society for Stem Cell Research Headquarters, 5215 Old Orchard Road, Suite 270, Skokie, Illinois 60077, USA. Telephone 224-592-5700, fax 224-365-0004, e-mail [isscr@isscr.org](mailto:isscr@isscr.org), website [www.isscr.org/](http://www.isscr.org/)

**June 27-29, Nashville, Tennessee:** 42nd Annual Conference of the Association for Professionals in Infection Control and Epidemiology. Contact Annual Conference of the Association for Professionals in Infection Control and Epidemiology, 1275 K Street, Northwest, Suite 1000, Washington, DC, 20005-4006, USA. Telephone 202-789-1890, fax 202-789-1899, e-mail [annual@apic.org](mailto:annual@apic.org), website [www.apic.org](http://www.apic.org)

**July 11-15, London, Ontario:** American Society for Virology 34th Annual Meeting. Contact Ruth Harland, Conference Planner, Western University. Telephone 519-661-2111 ext 85974, e-mail [rharland@housing.uwo.ca](mailto:rharland@housing.uwo.ca), website [www.asv2015.uwo.ca/](http://www.asv2015.uwo.ca/)

**July 25-29, Boise, Idaho:** 40th Annual International Herpesvirus Workshop. Contact Conference Solutions, 2545 Southwest Spring Garden Street, Suite 150, Portland, Oregon 97219, USA. Telephone 503-244-4294 ext 207, fax 503-244-2401, e-mail [ihw@conferencesolutionsinc.com](mailto:ihw@conferencesolutionsinc.com), website [www.herpesvirusworkshop.com/](http://www.herpesvirusworkshop.com/)

**August 22-26, Halifax, Nova Scotia:** 148th Annual Meeting of the Canadian Medical Association. Contact the Canadian Medical Association head office, 1867 Alta Vista Drive, Ottawa, Ontario K1G 5W8. Telephone 888-855-2555, fax 613-236-8864, e-mail [cmamsc@cma.ca](mailto:cmamsc@cma.ca), website [www.cma.ca/](http://www.cma.ca/)

**September 17-20, Quebec City, Quebec:** 2015 Canadian Surgery Forum. Contact the Canadian Surgery Forum, 421 Gilmour Street, Suite 300, Ottawa, Ontario K2P 0R5. Telephone 613-882-6510, fax 613-249-3326, e-mail [cboland@cags-accg.ca](mailto:cboland@cags-accg.ca), website [www.canadiansurgeryforum.com/](http://www.canadiansurgeryforum.com/)

**September 17-21, San Diego, California:** 2015 Interscience Conference of Antimicrobial Agents and Chemotherapy (ICAAC/ICC 2015). Contact American Society for Microbiology – Meetings Department, 1752 N Street Northwest, Washington, DC 20036, USA. Telephone 202-737-3600, e-mail [conferences@asmusa.org](mailto:conferences@asmusa.org), website [www.icaac.org/](http://www.icaac.org/)

**December 8-11, Miami, Florida:** 7th International Workshop on HIV Persistence, Reservoirs & Eradication Strategies. E-mail [info@hiv-workshop.com](mailto:info@hiv-workshop.com), website [www.hiv-workshop.com](http://www.hiv-workshop.com)



In treatment-naïve patients

TIVICAY® in combination with KIVEXA® demonstrated **statistically superior efficacy in achieving viral suppression vs. Atripla® at 48 weeks**<sup>1,2\*</sup>

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#### Indications and clinical use

TIVICAY® (as dolutegravir sodium), in combination with other antiretroviral agents, is indicated for the treatment of human immunodeficiency virus (HIV-1) infection in adults and children 12 years of age and older and weighing at least 40 kg. The following should be considered prior to initiating treatment with TIVICAY®: Poor virologic response was observed in subjects treated with TIVICAY® 50 mg twice daily with an integrase strand transfer inhibitor (INI)-resistance Q148H/K/R substitution plus 2 or more additional INI-resistance substitutions, including, but not limited to, T66A, L74I/M, E138A/K/T, and G140A/C/S, Y143R/C/H, E157Q, G163S/E/K/Q, or G193E/R. Clinical studies of TIVICAY® did not include sufficient numbers of patients aged 65 years and older to determine whether they respond differently from adult patients <65 years of age.

#### Contraindications

- In combination with dofetilide.

#### Relevant warnings and precautions

- Potential for opportunistic infections and other complications of HIV infection
- Risk of transmission of HIV infection: appropriate precautions should continue to be taken
- Hypersensitivity reactions reported with integrase inhibitors. Discontinue use if signs and symptoms of hypersensitivity develop
- Liver chemistry changes: increased risk for worsening or development of transaminase elevations in patients with hepatitis B or C co-infection receiving TIVICAY®-monitoring of liver chemistries is recommended
- Particular diligence should be applied in initiating or maintaining effective hepatitis B therapy in hepatitis B co-infected patients
- Immune reconstitution inflammatory syndrome (IRIS): Patients responding to antiretroviral therapy may develop an inflammatory response to indolent or residual opportunistic infections, including autoimmune disorders
- Lipodystrophy/fat redistribution observed in patients receiving antiretroviral therapy
- Should not be used in pregnant women unless the potential benefits outweigh the potential risks to the fetus
- Not recommended in pediatric patients younger than 12 years or weighing less than 40 kg. Safety and efficacy of TIVICAY® have not been established in children less than 18 years of age who were infected with suspected or confirmed INI-resistant HIV-1 virus
- Nursing mothers should be instructed not to breastfeed if they are receiving TIVICAY®
- Insufficient study data to determine if patients >65 years of age may respond differently; caution should be exercised in dose selection for the elderly patients due to the greater frequency of decreased hepatic, renal, or cardiac function, and of concomitant disease or other drug therapy

#### Dosage and method of administration

##### Recommended Dosing Regimen

| Patient Population   | Dose  | Regimen          |
|--|-------|------------------|
| <b>Adults and adolescents age 12 to 18 and weighing at least 40 kg</b> |       |                  |
| Treatment-naïve <sup>†</sup>   | 50 mg | QD <sup>†</sup>  |
| Treatment-experienced, INI-naïve <sup>†</sup>                          | 50 mg | QD               |
| <b>Adults</b>  |       |                  |
| Treatment-experienced, INI-resistant <sup>‡</sup>                      | 50 mg | BID <sup>§</sup> |

\* The dose of TIVICAY® is 50 mg twice daily when co-administered with potent UGT1A/CYP3A inducers, including efavirenz, tipranavir/ritonavir, fosamprenavir/ritonavir or rilampin.

<sup>†</sup> QD = once daily

<sup>‡</sup> Alternative combinations that do not include metabolic inducers should be used where possible for INI-resistant patients. The safety and efficacy of doses above 50 mg twice daily have not been evaluated.

<sup>§</sup> BID = twice daily

TIVICAY® can be taken with or without food.

#### Adverse events

The most common adverse reactions of moderate to severe intensity and incidence ≥2% (in those receiving TIVICAY® in any one study) are insomnia, headache, fatigue, nausea and diarrhea.

#### For more information

Please consult the Product Monograph at <http://tivicaypm.viivhealthcare.ca> for additional important information relating to adverse reactions, drug interactions and dosing. The Product Monograph is also available by calling 1-877-393-8448. To report an adverse event, please call 1-877-393-8448.

\* In SINGLE, 833 patients were randomized and received at least one dose of either TIVICAY® 50 mg once daily with fixed-dose abacavir/lamivudine (KIVEXA®) or fixed-dose efavirenz/tenofovir/emtricitabine (Atripla®) for 48 weeks.

References: 1. Viiv Healthcare ULC. TIVICAY® Product Monograph. February 4, 2015.

2. Walmsley SL, Antela A, Clumeck N, et al. Dolutegravir plus Abacavir-Lamivudine for the Treatment of HIV-1 Infection. *N Engl J Med*. 2013;369:1807-1818.