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30th Annual Canadian Conference on HIV/AIDS Research

CONGRÈS DE L'ACRV 2021

30e Congrès annuel canadien de recherche sur le VIH/sida

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ABSTRACTS
ABRÉGÉS

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Ivan Sadowski		Marc Steben	
Tara Schellenberg		Darrell Tan	
Aloysious Ssemaganda			

TABLE OF CONTENTS / TABLE DES MATIÈRES

ORAL ABSTRACTS

EPOSÉS ORAUX

66

Impact of LACTIN-V (Lactobacillus crispatus CTV-05) on genital immunology following standard bacterial vaginosis treatment: results from a randomized placebo-controlled trial

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Background: Bacterial vaginosis (BV) is associated with enhanced HIV risk, likely due to the induction of genital inflammation and associated epithelial barrier disruption. Lactobacillus crispatus is associated with immune quiescence and reduced HIV risk. We investigated the sustained impact of a L. crispatus-based live biotherapeutic (LACTIN-V) on proinflammatory cytokines, markers of epithelial disruption, and the vaginal microbiome, which was recently demonstrated to reduce BV recurrence (NCT02766023).

Methods: In this pilot study, soluble immune factor levels and the absolute abundance of key bacteria species were assayed for 48 participants who reported near-perfect adherence to assigned treatment during the phase 2b randomized double-blind placebo-controlled trial of LACTIN-V to prevent BV recurrence. All participants received topical metronidazole for 5-days and were then randomized 2:1 to LACTIN-V or matched placebo for 10 weeks. Vaginal swabs were collected before and after metronidazole therapy, and then at 4-, 8-, 12-, and 24-weeks. Cytokines were assayed using the MSD multiplex platform and the absolute abundance of bacteria species was measured with qPCR.

Results: Absolute abundance of L. crispatus was higher in the LACTIN-V arm compared to placebo at 12 weeks ($p<0.001$) and this increase was sustained for at least 3 months after product cessation ($p=0.013$). These sustained increases in L. crispatus abundance at 24 weeks correlated with reductions in vaginal concentrations of the prototypic inflammatory cytokine IL-1a ($r=-0.2973$, $p=0.0402$), the epithelial damage biomarker sE-cad ($r=-0.4860$, $p=0.0005$), and the BV-associated bacterial genus Prevotella ($r=-0.4341$, $p=0.0021$).

Conclusions: Treatment with LACTIN-V following standard antibiotic treatment enhanced L. crispatus colonization for at least 3 months after product cessation; these increases were associated with reduced inflammation and enhanced epithelial integrity, potentially due to the exclusion of BV-associated bacteria. Given the links between genital inflammation, epithelial disruption and HIV acquisition, LACTIN-V may represent a novel strategy to reduce HIV risk among women.

143

L'analyse du transcriptome de cellules B régulatrices provenant du sang d'individus HIV+ de la cohorte primo infection du Réseau FRQS démontre un profil associé à l'épuisement

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De nombreuses populations cellulaires sont dérégulées lors de l'infection par le VIH. Parmi celles-ci, on y retrouve les lymphocytes B de la zone marginale (MZ). Chez des individus sains, les populations de lymphocytes B innés de la zone marginale sont essentielles pour la formation des centres germinatifs et elles sont également capables de s'activer de façon T-indépendante et ainsi sécréter de nombreuses immunoglobulines polyréactives. De plus, nous avons récemment démontré que les précurseurs des MZ (MZp) ont un fort potentiel régulateur (Breg). Nous avions précédemment démontré que dans un contexte d'infection au VIH, l'excès du B-cell activating factor (BAFF) est concomitant avec l'augmentation de la fréquence des MZp. Afin de mieux comprendre cette dérégulation, une analyse du transcriptome par RNAseq a été effectuée sur des MZ et MZp du sang d'individus VIH+. L'expression des TLR7 et 10 sont augmentés, ce qui est compatible avec une signature interféron (IFN) chez ces cellules. Aussi, l'expression des marqueurs T-bet et CD11c, qui sont associés aux « age associated B cells » impliquées dans certains contextes auto-immuns et inflammatoires, est plus importante que celle des MZ et MZp provenant d'individus sains. Ces deux marqueurs sont également augmentés suite à une activation des cellules via TLR7 ou par une réponse IFN. De plus, l'expression de certains marqueurs associés à l'épuisement ou à l'activation du BCR, tels que CD85j, CD22, FCRL5 et CD72 est aussi plus importante chez les cellules MZ et MZp d'individus VIH+. Ensemble, ces résultats suggèrent que les MZ et MZp sont hyperactivées, épuisées et qu'elles présentent un profil similaire aux « age associated B cells » aussi retrouvées dans plusieurs infections inflammatoires chroniques.

237

Multiplex bead based serological assay to detect antibodies that recognize SARS-CoV-2 receptor binding domain and compete for ACE-2 receptor engagement

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Over the past year, SARS-CoV-2 has infected over 90 million people globally and resulted in nearly 2 million deaths. While novel vaccines have been developed and deployed rapidly to counteract this virus, the durabilty of antibody responses elicited by these vaccines is still uncertain. New research tools are thus needed to evaluate humoral immune responses against SARS-CoV-2 infection and vaccines.

We designed a Luminex-based assay to simultaneously quantify antibodies targeting the receptor binding domain (RBD) of SARS-CoV-2 and five related human coronaviruses (SARS, HKU1, NL63, OC43, 229E). This assay can assess the ability of antibodies to block RBD interactions with human angiotensin converting enzyme (ACE-2) receptor. Briefly, each RBD target was coupled to a distinct xMAP bead and validated using commercial antibodies. Beads were mixed with patient sera alone or sera supplemented with recombinant ACE-2. Bound IgG or IgM antibodies were quantified using a Luminex instrument. Reduced antibody binding observed in the presence of ACE-2 provides a surrogate measure of potential neutralizing activity in sera.

In a pilot study of sera from 10 SARS-CoV-2 patients, including 5 that displayed virus neutralizing activity, our results correlated with prior data collected using more traditional ELISA. Sera from virus neutralizers displayed higher amounts of SARS-CoV-2 RBD binding IgG antibodies ($p=0.03$) and were better able to compete with ACE-2 ($p<0.01$), both of which are consistent with better neutralization activity.

In summary, we developed a higher-throughput multiplex method to quantify and characterize antibody responses elicited following SARS-CoV-2 infection. This new research tool should enhance our ability to evaluate the efficacy and durability of current COVID-19 vaccines, and provide a new platform to test future vaccine candidates and antibody-based therapeutics.

130

A humanized mouse model of SARS-CoV-2 infection implanted with both human lung tissue and a highly reconstituted human immune system

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Despite the advent of safe and effective vaccines, the scientific community continues to work to understand the immune pathology that drives severe COVID-19 disease and to develop effective treatments against SARS-CoV-2. Thus, it is imperative to develop useful animal models that sufficiently recapitulate the immune-mediated lung pathology observed during SARS-CoV-2 infection and to rapidly evaluate candidate therapeutics. We modified our bone marrow, liver, thymus humanized C57BL/6-Rag2-/-gammac-/-CD47-/- triple knock-out (TKO-BLT) mouse model to support two subcutaneously implanted autologous human lung organoids to produce the TKO-BLT-Lung (TKO-BLT-L) mouse model of SARS-CoV-2 infection. Twelve weeks post-humanization the TKO-BLT-L mouse was engrafted with high levels of human immune cells (>2x105 human CD45+ cells/ml of blood). Within TKO-BLT-L mice, lung organoids grew to ~10mm in diameter and exhibited significant vascularization as assessed by ultrasound imaging. Histologic sections of human lung implants showed the presence of airways, ciliated epithelium, alveolar structures, cartilage and associated blood vessels. The TKO-BLT-L mice were successfully infected with SARS-CoV-2 virus via direct injection into the human lung organoid and supported detectable viral infection over a 10-day period based on qPCR and plaque assay. Immunohistochemical staining of lung organoids showed the localization of resident human alveolar macrophages pre-infection and immune infiltration and associated lung tissue damage upon infection with SARS-CoV-2. The TKO-BLT-L mouse model will allow the study of the immune mediated lung pathology observed during COVID-19 disease and the evaluation of therapeutic candidates in the context of genuine human lung tissue and a functional human immune system.

205

Role of nasal T cells in SARS-CoV-2-specific immunity in human volunteers

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Background: At least three approved vaccines are now available to reduce the spread of the COVID-19 pandemic. However, the quality and quantity of protective immune mechanisms induced following infection or vaccination remains unknown, particularly in the upper respiratory tract (URT), the primary site of viral entry. We developed in an ex vivo flow cytometry-based assay to enumerate and profile immune cells isolated from specific nasopharyngeal (NP) swabs used for SARS-CoV-2 diagnostic testing amongst healthy volunteers.

Methods: We pilot-tested several types of NP swabs to gauge optimal immune cell recovery. Cells were obtained from swabs via mechanical means, washed, and stained using a pre-titrated panel of fluorescently labelled monoclonal antibodies. Data were acquired on a BD LSRFortessaTM cytometer and analyzed using Flow Jo V10.

Results: Of the NP swabs we tested, only the BD paediatric swab yielded CD45+ as opposed to CD326+ epithelial cells. In BD pediatric swabs (n=8), a median of 3,082 (IQR: 2,351-6,168) CD45+ cells were recovered per swab, ~80% of which were CD3+ T cells. Using CD69 and CD103 as markers of tissue resident memory (Trm) T cells, virtually all CD8+ (>90%) and variable proportions of CD4+ T cells were Trm (10-80%). Our panel also captures the activation status of these cells (CD38, HLA-DR, perforin, Ki-67), and CD4 phenotypes, such as Th17 (CD161, CCR6), Tfh (CXCR5, PD1) and antigen-specificity (CD40L, OX40). Efforts are currently underway to apply these methods to characterize nasal T cells pre- and post-COVID-19 vaccination.

Conclusions: Nasal T cell studies are feasible due to successful isolation of T cells from certain types of NP swabs. A high proportion of these T cells appear to be tissue resident. Examining protective immune responses induced in the URT following immunization with COVID-19 mRNA vaccines may be critical to understanding the nature and localization of this protection.

252

Weak humoral immune reactivity among residents of long-term care facilities following one dose of COVID-19 mRNA vaccine BNT162b2

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Background: Residents of long-term care (LTC) facilities are at significantly higher risk of severe COVID-19. Two-dose mRNA vaccines greatly reduce risk of hospitalization and mortality; however, limited vaccine availability has led many Canadian provinces to delay second doses. While this delay is supported by reductions in COVID-19 outbreaks in LTC facilities following initial vaccine rollout, few data are available on immunogenicity of a single mRNA vaccine dose among the elderly.

Methods: We studied 12 LTC residents (median age, 82 years) and 18 healthcare workers (HCW; median age, 36 years). Plasma/sera were collected pre-vaccine and one month following the first dose of BNT162b2 vaccine. Total antibody responses to SARS-CoV-2 nucleocapsid (N) and spike protein receptor binding domain (RBD) were assessed using commercial immunoassays (Roche). Luminex-based ELISA was used to quantify IgG and IgM to RBD and to determine the ability of antibodies to compete ACE2 receptor binding to RBD. Neutralizing antibody responses were assessed using pseudovirus and live SARS-CoV-2.

Results: At baseline, all participants were negative for anti-N and anti-RBD antibodies, consistent with no prior SARS-CoV-2 infection. After one vaccine dose, binding antibody responses against RBD were ~4-fold lower in residents compared to HCW ($p<0.001$); one resident mounted no response above background. Consistent with this, antibody competition with ACE2 binding was 3-fold lower in residents compared to HCW ($p=0.01$) and pseudovirus neutralizing activity was 2-fold lower ($p=0.003$). Finally, while six HCW (33%) displayed marginal ability to neutralize SARS-CoV-2 infection at a 1:20 dilution, only one resident did (8%) ($p=0.19$).

Conclusions: The implications of our findings for SARS-CoV-2 transmission and COVID-19 outcomes are unclear, but the observation that residents of LTC facilities display significantly reduced humoral immune reactivity after one dose of mRNA vaccine suggests that the interval between the first and second dose should not be extended in elderly individuals.

197

Second Mitochondrial Activator of Caspases (SMAC) Mimetics as Novel HIV Latency-Reversing Agents (LRA) for HIV Eradication

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Antiretroviral therapy (ART) suppresses HIV replication but is unable to eliminate latent viral reservoirs (VR) comprising of CD4+ T cells and macrophages. These cell populations have elevated expression of Inhibitors of Apoptosis Proteins (IAPs), enabling prolonged cell survival. The most effective LRA, PKC agonists, reactivate VR by activating the NF-kB pathway. However, since they are likely to dramatically increase inflammation in vivo, they are difficult to evaluate clinically. Consequently, there is a need for novel therapeutic interventions for VR eradication. Herein, we demonstrate that a bivalent SMAC Mimetic (SM) reactivates up to 60% CD4+ T cells in models of latency (J-Lat 10.6, J-Lat 5A8 and 2D10) by activating the non-canonical NF-kB pathway. As well, the SM induces apoptosis in up to 30% and 50% CD4+T and myeloid cell models of latency (OM-10.1, U1 and THP89GFP) respectively, via degradation of IAPs and upregulation of caspases. The results were validated in primary CD4+ T cells and differentiated THP-1 cells infected with a dual reporter virus-HIV-CRMZ. The ability of the SM to reactivate and reduce VR was then tested in virally-suppressed humanised bone-marrow–liver–thymus (hu-mice). SM was non-cytotoxic in hu-mice for up to 4 weeks and induced viral reactivation in at least 70% of ART-suppressed animals as exemplified by the detection of HIV viral load in sera and increased HIV-RNA and p24-antigen expression in almost all analysed tissues. Furthermore, SM reduced the VR by at least 10-fold as measured by the frequency of cells harboring integrated and total HIV-DNA in lymphoid and non-lymphoid tissues. In conclusion, this SM is an effective LRA with a capacity for preferential elimination of VR (both CD4+ T cells and Macrophages) that has not been studied in the previously published articles. This promising approach for systemic clearance of VR might increases opportunities for HIV eradication.

97

Interaction Between the Integrase Strand Transfer Inhibitor Dolutegravir and Folate Transporters/Receptor in Human and Rodent Placenta

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In 2018, reports from the Tsepamo study in Botswana highlighted a concerning interaction between exposure from the time of conception to the HIV integrase strand transfer inhibitor dolutegravir (DTG), and neural-tube defects (NTDs) in the offspring of women accessing antiretroviral therapy. Due to the importance of folates in fetal development, and the established association of folate-deficiency with NTDs, it is critical to investigate potential interactions between DTG and folate pathways in the developing fetus. In this study, we investigated the effect of in utero DTG exposure on the functional expression of placental proteins important for folate delivery to the fetus, including reduced folate carrier (RFC) and proton-coupled folate transporter (PCFT), as well as the folate receptor-α (FRα).

We first characterized the expression of RFC, PCFT and FRα in a panel of human placenta cell-lines and in human placental explants by qPCR, immunoblotting and immunohistochemistry analyses. In the first-trimester human placental cell line HTR-8/SVneo, exposure to clinically-relevant concentrations of DTG was associated with a modest but significant reduction in the expression of RFC and PCFT both at the mRNA and protein levels, following 3h and 6h of exposure. DTG exposure was also associated with reduced uptake of 50 nM [3H]-folic acid, a PCFT substrate, in HTR-8/SVneo cells at 3h and 6h exposure. To investigate the interaction of DTG with placental folate pathways in vivo, pregnant mice were treated daily with clinically relevant doses of DTG, and placentas were isolated on gestational day 15.5. In these mouse placentas, we identified a very modest induction of both RFC and PCFT at the mRNA level associated with in utero DTG exposure.

Together, these findings suggest a potential interaction between DTG and folate pathways in the placenta, which could potentially impact folate delivery to the fetus in the context of antiretroviral therapy during pregnancy.

172

Modulating HIV-1 envelope glycoprotein conformation to decrease the HIV-1 reservoir

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Antiretroviral therapy (ART) controls HIV-1; it however does not eliminate the virus, and virus re-emerges upon ART interruption. Thus, new approaches aimed at eradicating or functionally curing HIV are needed. A promising approach to eliminate latently infected cells after viral reactivation relies on the ability of immune cells to mediate antibody-dependent cellular cytotoxicity (ADCC). Through ADCC, effector cells such as NK cells and monocytes can kill infected cells expressing envelope glycoproteins (Env) through recognition by HIV-specific antibodies (Abs). Small CD4-mimetic compounds (CD4mc) sensitize infected cells to ADCC mediated by CD4-induced (CD4i) Abs present in HIV+ sera. Two families of CD4i Abs are required to sensitize infected cells to ADCC in the presence of CD4mc: anti-cluster A and anti-coreceptor binding site Abs. These CD4i Abs in combination with CD4mc stabilize a new Env conformation, State 2A, which is highly vulnerable to ADCC. We employed new-generation SRG-15 humanized mice that supports NK cell and Fc-effector functions in vivo, to demonstrate that brief treatment with CD4mc and these two families of Abs significantly decreases HIV-1 replication, reduces the virus reservoir and substantially delays virus rebound after ART interruption. The decrease in the size of the reservoir was significantly less pronounced when using Fc-impaired Abs or hu-mice depleted of NK cells. Thus, indicating a role for Fc-mediated effector functions in viral reservoir elimination. Viral rebound was also suppressed in HIV-1+-donor cell-derived humanized mice supplemented with autologous plasma and CD4mc. These results indicate that CD4mc could have therapeutic utility in HIV-1-infected individuals for decreasing the size of the virus reservoir and/or achieving a functional cure.

161

Reconstructing Within-Host HIV Evolutionary History in Seroconverters from the Women's Interagency HIV Study

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Background: Women with HIV-subtype-B infection are understudied in persistence research. Towards addressing this, we reconstructed within-host HIV evolution in three seroconverters from the Women's Interagency HIV Study to infer proviral ages and temporal stability during-cART, and to compare ages of rebound viruses to the overall proviral pool.

Methods: Participants 1, 2 and 3 (P1, P2, P3) initiated cART in chronic infection; total follow-up was 22, 14 and 15yrs. Pre-cART longitudinal single-genome-amplified (SGA) plasma HIV RNA env-gp120 sequences were previously published. We now used SGA (env-gp120) to characterize plasma HIV emerging after initial suppression (P1); proviruses sampled on-cART (P1:4 times over 5yrs; P2:thrice over 4yrs; P3:once). Within-host phylogenies were inferred from intact and unique sequences, from which rebound virus and proviral ages were estimated by root-to-tip regression.

Results: P1, P2 and P3's intact-env dataset sizes were 340, 176 and 231, where proviruses were 80%, 80% and 55% unique. For P1, unique proviruses initially sampled-on-cART were an estimated 8yrs-old on average (oldest 16yrs) with most dating to chronic phase. Proviral integration dates remained stable over 5yrs on-cART ($p=0.68$) but rebound viruses emerging after 1yr of suppressive-cART were younger than the persisting proviral pool ($p<0.0001$). P2's unique proviruses were 5yrs-old on average (oldest 8yrs) at initial sampling, with most dating to chronic phase; proviral integration dates remained stable over 9yrs ($p=0.55$). P3's unique proviruses were an estimated 7yrs-old on average (oldest 13yrs) with many dating to early infection.

Conclusion: Proviral age distributions support ongoing archiving and persistence of diverse proviral lineages pre-cART. Modest skewing towards chronic-phase deposition in 2 participants is consistent with reports in HIV-subtype-C and among men. Stability of proviral integration dates on-cART supports negligible decay of the proviral pool. Younger ages of rebound viruses suggest these emerged from a recently established replication-competent reservoir, as compared to the older proviral pool.

95

MxB Inhibits HIV-1 Rev-dependent Viral Gag Expression by Sequestering Rev in the Cytoplasm

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HIV-1 infection is subject to restriction by host factors. In turn, HIV-1 often has countering mechanisms to antagonize and evade these host restriction factors. The interferon-inducible myxovirus resistance B (MxB) protein has been shown to inhibit HIV-1 infection by blocking the nuclear import of viral DNA. HIV-1 is able to escape from MxB restriction by mutating viral capsid protein. In this study, we report a new anti-HIV-1 mechanism of MxB by inhibiting HIV-1 Rev protein. Rev is a nuclear protein, exports full-length and singly spliced viral RNA into the cytoplasm for translation, thus plays an essential role in viral gene expression. We observed that MxB sequesters Rev within the cytoplasm, impairs Rev-dependent viral RNA export, and suppresses viral Gag protein expression. Specifically, MxB disrupts the association of Rev with its nuclear transport receptor transportin 1 (TNPO1), thus causes Rev cytoplasm retention. By testing a group of Rev variants in HIV-1 strains isolated from HIV patients, we identified MxB-resistant Rev mutations which allow Rev to enter the nucleus independent of TNPO1. Also, HIV-1 is able to overcome MxB inhibition of Rev by increasing Rev protein expression thanks to the feedback mechanism that regulates HIV-1 gene expression. Overall, these results have extended our understanding of the anti-HIV-1 mechanisms of MxB from blocking the nuclear import of viral DNA to interfering with the nuclear import of essential viral proteins.

244

The Lentivirus Restriction Factor APOBEC3C Was Not Active Against Lentiviruses In Old World Monkeys But Gained Activity In The Hominid Lineage

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The human APOBEC3 (A3) family of cytidine deaminases includes five host restriction factors that inhibit HIV-1 in the absence of its Vif protein that causes their degradation. The deamination of cytidine in HIV-1 (-)DNA forms uracil that causes inactivating mutations when uracil is used in the (+)DNA synthesis template. The A3 family exhibits considerable variation in their antiviral activity. For example, A3G is the most restrictive and A3C is the least restrictive. In most cases this activity in human A3 enzymes is overall less than chimpanzee A3 enzymes, suggesting that activity has been decreasing through evolution. This is thought to have occurred since A3 enzymes can erroneously cause mutations in the human genome and contribute to cancer. However, for A3C, although we have previously found that chimpanzee and gorilla A3C are more active than human A3C, we also observed the surprising result that old world monkey A3C from rhesus macaque (rh) was not active against HIV-1. The activity in hominid A3C is determined by an I188 or a K115 that enable the A3C to dimerize which increases its deamination activity and processivity on (-)DNA. The rhA3C has an I188, but this does not enable dimerization due to the steric hindrance imparted by the residue M115. Mutational analysis showed that although rhA3C shares a similar dimer interface with hominid A3C, the key amino acids needed to promote activity were at positions 44, 45, and 144. Overall, the data show that A3C was less active in old world monkeys and gained activity in the hominid lineage, which is the opposite to evolution of other A3 enzymes. A3s were thought to be more active in old world monkeys due to higher lentivirus burdens, but these data demonstrate that there are more things to learn about the evolutionary pressures that formed the A3 family.

181

Impact of the COVID-19 Pandemic on Deferral of Health Care and Mental Health Service Utilization for People Living with HIV in Ontario, Canada

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Background: The COVID-19 pandemic has shifted healthcare services to telephone/virtual platforms, limited service capacity, and deferred some care. For those living with HIV, COVID-19 has disrupted the provision of essential care, especially for those experiencing syndemics like mental health disorders. Our aim was to capture the impact of COVID-19 on care experiences for people living with HIV.

Methods: The Ontario HIV Treatment Network Cohort Study is a community-driven, longitudinal, clinic-based cohort of over 9,000 people living with HIV in Ontario, Canada, with annual interviewer-administered questionnaires at 13 sites. In May 2020, we implemented a virtually-administered 35-item COVID-19 questionnaire module to assess the impact of COVID-19 on people living with HIV.

Results: Results from 1,166 responses collected between May and December 2020 include 276 women and 880 men (median age: 52 years, 61% white, 22% black). Amongst men, 748 (85%) identified as men who have sex with men. Approximately 44% (n=507) of respondents remotely accessed primary care with 86% (n=437) reporting being ‘very’ or ‘somewhat’ satisfied, and 38% (n=437) remotely accessed HIV-specific care (n=373, 85% satisfied). Alarmingly, of the 292 people accessing mental health care, 161 (55%) reported having had care interrupted. Additionally, 37% (n=435) of participants deferred at least one type of care, with 24% of those (n=106) being ‘extremely’ or ‘quite a bit’ concerned about the impact on their long-term health.

Discussion: Despite healthcare systems transitioning to remote care during COVID-19, more than a third of people living with HIV report deferring care and fear that it may impact their long-term health. However, where remote options are available, respondents report high levels of service satisfaction. Continued isolation, service modification, and reduced access may have lasting negative health consequences for people living with HIV. This research highlights the need for flexible care models that support equitable access.

191

Loneliness and Elevated Prevalence of Depression during COVID-19 Pandemic among Participants of the OHTN Cohort Study (OCS)

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Background: Physical and social isolation due to the COVID-19 pandemic may be triggers for substance use and mental health issues among people living with HIV. We examined whether loneliness due to the pandemic was associated with increased depression and hazardous alcohol use among participants of the OCS.

Methods: The OCS is a cohort of people receiving HIV care at 13 clinics across Ontario. Clinical data is collected through chart abstraction and linkage with the Public Health Ontario Laboratory database. Participants also complete an annual interviewer-administered questionnaire that includes Alcohol use (AUDIT-C) and depression (PHQ-9). Since May 2020, additional COVID-19 related items included experiences of physical isolation and loneliness. We used logistic regression to examine the relationship between loneliness, alcohol use, and depression.

Results: Sample included 640 participants (median age: 45 years) and most were male (75%), Gay/Lesbian/Bisexual/Queer (66%), White (60%), and born in Canada (62%). Compared to the pre-pandemic period, prevalence of depression (26% vs. 28%, p=0.216) and hazardous alcohol use (37% vs 38%, p=0.448) remained stable. Nearly half (48%) reported increased loneliness during the pandemic and those who felt increased loneliness had significantly (p<0.01) higher prevalence of current depression (36% vs. 16%) and hazardous alcohol use (34% vs. 23%) than those who did not experience increased loneliness. In multivariable analyses, increased loneliness was associated with increased risk of depression (aPR: 1.96, 95% CI: 1.43-2.68) but not with hazardous alcohol use (aPR: 1.08, 95% CI: 0.87-1.35) after controlling for pre-pandemic depression and hazardous alcohol use, physical health, and demographic variables.

Discussion: Our results suggest that, although the overall prevalence of depression remained stable, OCS participants who felt increased loneliness during the pandemic were at higher risk of depression. Interventions that address mental health among those at risk of social isolation may improve the mental health of people living with HIV.

52

Cancer Among People Living with HIV in Ontario, Canada, 1997-2018

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Background: Cancer is an important comorbidity among people living with HIV (PLWH). We estimated cancer burden among people with HIV in Ontario.

Methods: We conducted a population-based retrospective cohort study of PLWH (≥18 years) using health administrative data assessing incident cancers from 01/01/1997 to 31/12/2018. Cancers were categorized as AIDS-defining cancers (ADC), infection-related non-ADC (NADC) and infection-unrelated NADC. We used direct standardization (2011 Canadian population as reference) to calculate age-standardized incidence with 95% confidence intervals (CI) and the counting method to calculate 2-, 5-, and 10-year limited duration prevalence.

Results: Among 17,675 individuals (78% males) followed for 179,485 person-years (PY), 1127 first primary incident cancers were diagnosed (531 [47%] infection-unrelated NADC, 267 [24%] infection-related NADC and 329 [29%] ADC). Cancer incidence declined from 1087/100,000 PY (95% CI 646, 1714) in the early cART era (1997-2000) to 757/100,000 PY (659, 866) in 2016-2018. Infection-unrelated NADC incidence ranged between 499/100,000 PY (196, 1045) in 1997-2000 and 489/100,000 PY (409, 580) in 2016-2018. Infection-related NADC incidence declined from 200/100,000 PY (43, 573) to 168/100,000 PY (124, 221) between 1997-2000 and 2016-2018. Similarly, ADC incidence decreased from 387/100,000 PY (185, 712) in 1997-2000 to 101/100,000 PY (70, 142) in 2016-2018. When stratified by sex, cancer incidence among females surpassed cancer incidence in males in 2016-2018 (aIR females: 859/100,000 PY [638, 1132] vs. aIR males: 705/100,000 PY [597, 826]). Among 14,896 people alive at the end of follow-up, 1.1% (n=165), 3.1% (n=463) and 5.5% (n=824) had a cancer diagnosis in the past 2, 5 and 10 years, respectively.

Conclusions: This is the first study of the overall cancer burden among PLWH in Ontario. Although infection-related NADC and ADC incidence declined, infection-unrelated NADC incidence remained high throughout the study period. These findings can locally inform cancer prevention and care service planning.

33

Impact of obesity on concordance of serum liver biomarkers and transient elastography in HIV

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Background: Transient elastography (TE) with controlled attenuation parameter (CAP) is a feasible and accurate tool to assess both non-alcoholic fatty liver disease (NAFLD) and associated liver fibrosis in people with HIV (PWH). However, it is not widely accessible. Serum liver biomarkers, including FIB-4, APRI and hepatic steatosis index (HSI), can be used for large scale studies and in limited resource settings. Concordance between TE with CAP and serum biomarkers in PWH is not known, particularly across the spectrum of body mass index (BMI).

Methods: HIV mono-infected patients from three prospective cohorts (LIVEHIV in Montreal, LHIVPA in Palermo, MHMC in Modena) underwent TE with CAP and serum liver biomarkers. NAFLD was defined as CAP ≥285 dB/m. A HSI threshold <30 defined absence of NAFLD. Multivariable logistic regression was used to identify predictors of discordance between serum fibrosis biomarkers and TE, defined as FIB-4<1.3 with TE>7.1, and as APRI<0.5 with TE>7.1.

Results: 1510 PWH were included. Discordance between HSI<30 and CAP>285 for NAFLD was rare (1% in normoweight PWH, no discordance in overweight and obese PWH). For FIB-4 and APRI compared to TE, most of the discordance was observed in obese patients. Of note, over 5% of PWH defined as cirrhotic by TE>13 were missed by both FIB-4<1.3 and APRI<0.5. After adjusting for sex, CD4 cell count and time since HIV diagnosis, BMI was an independent predictor of discordance for both FIB-4<1.30 with TE>7.1 (OR 1.13, 95% CI: 1.08-1.19) and APRI<0.5 with TE>7.1 (OR 1.13, 95% CI 1.08-1.17). In obese patients, the combination of HSI<30 and APRI<0.5 or HSI<30 and FIB-4<1.3 had 100% negative predictive value to exclude presence of liver cirrhosis by TE.

Conclusions: Obese PWH have less concordance between serum fibrosis biomarkers and TE to diagnose significant fibrosis. The combination of multiple serum biomarkers should be considered in obese PWH.

39

Peripherally inserted central catheters during hospital admissions: Clinical and public health considerations from interviews with health care providers and people living with HIV/HCV who use drugs

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Background: People living with HIV and/or HCV who use drugs are at greater risk of acquiring serious infections (e.g., endocarditis, viral infections). Parenteral antibiotic therapy (PAT) delivered through peripherally inserted central catheters (PICCs) is best practice to treat bacterial infections. However, health care providers (HCPs) are often concerned about the risk of PICCs being 'abused' and limit their use with people who use drugs (PWUD). This presentation reports on the use of PICCs from HCPs and PWUDs perspectives.

Methods: This study draws on n=50 interviews conducted in Toronto and Ottawa; we recruited 24 PWUDs with self-reported HIV and/or HCV infection, history of substance use, hospital admission in the past five years; and, 26 HCPs (physician, nurse, social worker etc.) with experience with this patient group. Participants completed semi-structured, audio-recorded interviews (10-60min). Thematic analysis was conducted.

Results: Stigma and lack of trust between most PWUD and their HCPs influenced if, how, and when PICCs were used. Most HCPs were reluctant to prescribe PICCs fearing use by patients to inject drugs that had not been prescribed. Concerns about the health and liability risks led some to withhold PICCs even when clinically indicated, and/or to closely monitor patients with PICCs. Contrary to HCPs fears, most PWUD reported never injecting into a PICC but were heavily surveilled and threatened when given one. A participant who had injected into their PICC described it as a way to avoid infections. A minority of HCPs educated their patients about how to safely manage their PICC (including when injecting), and some managed opioid needs as part of PAT.

Conclusions: This study suggests the need to challenge how drug user related stigma may influence clinical decisions and implement patient centred/harm reduction approaches to improve therapeutic relationships and outcomes for people living with HIV and/or HCV who use drugs.

17

Effectiveness and Safety of bictegravir/emtricitabine/tenofovir alafenamide (B/F/TAF) in People Living with HIV in Canada: 12-month (12M) Results of BICSTaR

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BICSTaR Canada (GS-CA-380-4574/NCT03580668) is an ongoing, observational cohort study evaluating the effectiveness, safety and tolerability of B/F/TAF in antiretroviral treatment-naïve (TN) or treatment-experienced (TE) adults living in Canada with HIV. This analysis includes HIV-1 RNA (missing=excluded analysis), drug-related (DR) adverse events (AEs), weight changes and treatment persistence in participants who completed a 12M visit.

170 persons (10 TN and 160 TE) were included in the analysis. Most were male (88%), white (72%) and 52% were ≥50 years old. Baseline comorbidities were very prevalent (90%), including neuropsychiatric disorders (38%), hyperlipidemia (27%), and hypertension (24%). Amongst TE persons, 68%/23%/11% switched from INSTI/NNRTI/PI regimens to B/F/TAF, respectively; 46% switched from TDF-containing regimens. 19 participants (12%; 2 TN and 17 TE) had baseline primary resistance (7% NRTI [6 M184V/I, 1 K65R] and 6% NNRTI [7 K103N/S] mutations). Of those with data at 12M (n=154), 9/9 (100%) TN and 140/145 (97%) TE had HIV-1 RNA <50 copies/ml, with no emergent resistance. Median CD4+ cell counts (cells/µl) increased in TN (392 to 699) and were stable in TE (586 to 583) from baseline to 12M. Persistence with B/F/TAF was 93%; 1 TN and 11 TE discontinued (5 due to AEs, 5 participant/investigator decision, 1 death, 1 lack of efficacy). No discontinuations occurred due to renal/bone/hepatic AEs and no serious DRAEs were recorded. DRAEs occurred in 12 TE participants (7%), with weight increase (n=4) and psychiatric disorders (abnormal dreams [n=1], anxiety [n=1] and major depression [n=1]) being most common. Median (Q1, Q3) weight change was +1.6 kg (0.5, 4.7) for TN (n=7) and +0.7 kg (−1.3, 2.7) for TE (n=117), with modest BMI changes (TN: +0.6 kg/m² [0.1, 1.4]; TE: +0.2 kg/m² [−0.5, 0.8]).

B/F/TAF was highly effective and well-tolerated through one-year in this real-world Canadian cohort, consisting largely of older adults with HIV and multiple comorbidities.

45

Clinical HIV outcome trajectories for women living with HIV with a childhood history of child protective service out-of-home care: findings from a longitudinal Canadian cohort study

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Background: Childhood protective service (CPS) out-of-home care, including foster care and group homes, is associated with poorer health outcomes. Knowledge gaps exist regarding prevalence and outcomes of out-of-home care among women with HIV. We examined if childhood CPS out-of-home care was associated with HIV outcome trajectories among women with HIV in Canada.

Methods: We conducted a longitudinal study with women with HIV in Ontario, British Columbia and Quebec. At three timepoints across five years, we examined CD4 counts (<200, 200-500, >500 cells/mm3), current anti-retroviral therapy (ART) use, and detectable/undetectable viral load (VL) (<50 copies/mL). We used latent class growth analysis to identify trajectories of these outcomes and assessed if childhood CPS out-of-home care (foster/group home) was associated with class membership.

Findings: Nearly one-fifth (n=272,19%) of participants (n=1422, mean age: 42.8) reported childhood out-of-home care. We identified four trajectories of CD4 counts: consistently high (35%), consistently low (8%), consistently medium (15%), and U-shaped (42%). Best fitting models for ART use and VL both included two trajectories with intercept, slope, and quadratic terms. Most participants (89%) were in categories that used ART and had a consistently undetectable VL. Individuals with a history of CPS out-of-home care were two to three times more likely to be in the 'consistently low' CD4 count class relative to any other class (βs=0.75–1.16, ps=0.002–0.02) and twice as likely to have a consistently detectable VL (β=0.72, p=0.02); there were no differences in ART use over time.

Discussion: Women with HIV disproportionately experience childhood CPS out-of-home care, with rates 14-fold higher than the national prevalence (1.3%), signaling the urgent need for HIV preventive strategies with CPS-involved youth. Women with HIV with CPS involvement had worse HIV outcome trajectories (low CD4, detectable VL). Better understanding pathways from CPS-involvement to clinical outcomes can inform tailored HIV care for women with HIV.

100

Improving Access to Sexual and Reproductive Health Services Among Cis and Trans Women Living with HIV: Correlates of Self-reported Comfort Discussing Sexual and Reproductive Health with Primary HIV Providers

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Background: Access to sexual and reproductive health (SRH) services is critical for cisgender and transgender women living with HIV (WLWH), who have historically faced substantial stigma within the healthcare system. HIV providers can be a critical point of referral and provision. Our study therefore examined prevalence and correlates of being comfortable discussing SRH with participants' primary HIV provider.

Methods: Data were drawn from a longitudinal community-based open cohort (SHAWNA) of cis and trans WLWH aged 14 and older. The associations between social-structural factors and two outcomes ('being comfortable discussing sexual health[SH]' and 'being comfortable discussing reproductive health[RH]') were analyzed using bivariate and multivariable logistic regression models with generalized estimating equations for repeated measures over time. Adjusted odds ratios (AOR) and 95% confidence intervals[95%CIs] are reported.

Results: Our study included 314 participants, 1392 observations over 4.5 years of follow-up. Overall, 77.1% felt comfortable discussing SH while 64.7% were comfortable discussing RH with their primary HIV provider at baseline. In multivariable analysis, being comfortable discussing SH was inversely associated with: sexual minority identity (AOR:0.59, 95%CI:0.37-0.94), gender minority identity (AOR:0.52, 95%CI:0.29-0.95) and enacted HIV stigma (AOR:0.55, 95%CI:0.31-0.97) and positively associated with accessing women-centred services (Oak Tree Clinic)(AOR:4.25, 95%CI:2.20-8.23). Being comfortable discussing RH was inversely associated with: sexual minority identity (AOR:0.56, 95%CI:0.40-0.79), gender minority identity (AOR:0.45, 95%CI:0.25-0.81) and being born in Canada (AOR:0.29, 95%CI:0.15-0.56) and positively associated with accessing women-centred services (AOR:1.81, 95%CI:1.29-2.53) and a history of pregnancy (AOR:2.25, 95%CI:1.47-3.44).

Conclusions: Our findings suggest that there is an unmet need for safe SRH care and practice among WLWH, and in particular, for WLWH who identify as members of sexual and gender minority communities and those who experience enacted HIV stigma. HIV providers should create safe, non-judgmental, gender-affirming spaces for discussions on SRH to occur; this can be facilitated through awareness, women-centred and trauma-informed approaches.

41

Clinician and Community Preferences for Bacterial Sexually Transmitted Infection (STI) Testing Interventions Among Men Who Have Sex With Men (MSM): An E-Delphi Study in Toronto

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Background: Clinical guidelines recommend at least annual and quarterly sexually transmitted infection (STI) testing among sexually active men who have sex with men (MSM), including those on HIV PrEP or in HIV care. We built consensus around interventions to improve local STI testing services for MSM in Toronto using a web-based “e-Delphi” process.

Methods: We recruited Experts for a Community Panel (MSM who sought/underwent STI testing in the preceding 18 months, conducted 09/2019-11/2019) and a Provider Panel (offered STI testing to MSM in the past 12 months, conducted 02/2020-05/2020). Experts prioritized 6-8 potential interventions, generated from a literature review, on a 7-point Likert scale over 3 survey rounds. Consensus was defined as ≥60% within a ±1 response point. Summaries of panel responses were given in successive rounds.

Results: Among Community Experts, 43/51 (84%) completed all rounds; 19% HIV-positive, 37% HIV-negative on PrEP, 42% HIV-negative not on PrEP. The highest-rated interventions were Client Reminders, Routine and Express testing, citing convenient testing while also maintaining a relationship with their provider (Table 1). Priorities did not differ by HIV status or PrEP use. Among Provider Experts, 37/48 (77%) completed all rounds; 59% were physicians. Highest-rated interventions were Online-based, Express and Nurse-led testing, citing streamlined processes and decreasing the need to see a provider (Table 1).

Discussion: Both panels were enthusiastic about innovations that make STI testing more efficient. However, Community Experts preferred convenient interventions that involved their provider while Provider Experts favoured interventions that prioritized patient independence and reduced patient-provider time.

146

Healthcare Utilization Trends Associated with Suicide Death Among People Living with HIV in British Columbia, Canada, Between 1998-2012

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Introduction: People living with HIV (PLHIV) are at a higher risk of suicide, despite advances in antiretroviral therapy (ART) in recent years. Healthcare utilization trends help identify underlying healthcare interaction patterns for those at risk of suicide. We hypothesized that PLHIV who died by suicide interact with healthcare systems less than PLHIV who died by all other causes between 1998 and 2012 in British Columbia (BC).

Methods: PLHIV in the Comparative Outcomes and Service Utilization Trends (COAST) study with a recorded death and at least 90-days of follow-up were included. Using healthcare utilization codes identified within BC administrative datasets, we used bivariable and multivariable logistic regression models to examine associations between healthcare utilization and death by suicide (vs. death by other causes). Analyses controlled for age at death, sex, health authority, neighbourhood socioeconomic status, and time period of death.

Results: Among 2363 individuals who met the inclusion criteria, 71 PLHIV died by suicide with significantly lower healthcare counts with a median of 4 (Quartile 1st-3rd(Q1-Q3):2-11), compared to 2292 PLHIV who died of other causes with a median of 13 (Q1-Q3:5-25). Adjusting for potential confounders, the logistic models found death by suicide was associated with lower total number of healthcare codes billed (odds ratio(OR):0.95, 95%CI:0.93,0.98), lower number of codes other than mental health and self-harm (OR:0.94, 95%CI:0.91,0.96), but higher number of codes related to self-harm (OR:1.07, 95%CI:1.01,1.14). Mental health code counts, however, were not significantly associated with suicide death (OR:1.00, 95%CI:0.96,1.04).

Conclusions: Our study results suggest that PLHIV who die by suicide engage with the healthcare system less when compared to those who die of other causes, despite there being no differences in the presentation of mental health codes. Given clear indications for risk of self-harm, these analyses highlight potential missed opportunities for suicide prevention among PLHIV on ART in BC.

186

Charting HIV Care for Trans Women in Clinical Care: Findings from the Montreal-Toronto Trans Study (MTTS)

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Background: Globally, trans women living with HIV are known to experience inequitable HIV care access. The main objective of this study was to characterize HIV care among trans women living with HIV in Canada and identify factors that may influence HIV care access.

Methods: Sociodemographics, clinical factors, and laboratory values were collected from charts of trans women aged ≥16 years across 7 family medicine, endocrinology, and/or HIV clinics in Montreal and Toronto. Data were analyzed for 92 trans women living with HIV. The prevalence of each HIV care outcome (ever accessed HIV specialist care, ever ART use, current ART use, and current viral load suppression [<200 copies/ml]) were reported overall and compared across subgroups using chi-square tests.

Results: Of eligible participants, 48.5% had ever accessed HIV specialist care, 97.2% ever used ART, 93.5% currently used ART, and 93.8% had suppressed viral load. A higher proportion of those never diagnosed with a mental health condition (72.7% vs. 47.2%; p=0.041) and those who had seen an endocrinologist (45.0% vs. 28.6%; p=0.030) had accessed HIV specialist care. A higher proportion of those born outside of Canada ever used ART (100.0% vs. 86.7%; p=0.020). A higher proportion of participants of color ever used ART (100.0% vs. 83.3%; p=0.006) and currently use ART (100.0% vs. 76.9%; p=0.012). A higher proportion of those with no documented injection drug use (IDU) (96.7% vs. 66.7%; p=0.017) and those with documented planned or completed gender-affirming surgery (100.0% vs. 90.6%; p=0.043) were currently virally suppressed.

Conclusions: This clinical sample of trans women living with HIV in Toronto and Montreal had optimal estimates for HIV care engagement. Findings of this analysis can be leveraged to identify target populations (e.g., trans women with a history of IDU) and specific strategies (e.g., increasing access to gender-affirming care) to increase engagement in HIV care.

240

Evolving Patterns of Brand and Generic Antiretroviral Drug Utilization Within a Universal Healthcare System in Canada

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Background: Although the effectiveness of antiretrovirals (ARVs) is unquestionable, the high cost of new drugs puts considerable economic pressure. Generic drugs play a central role in the sustainability of healthcare systems. This study modelled the utilization of both generic and brand ARV products in a publicly funded HIV treatment program to improve understanding of the market share of prescribed ARVs, and generic drug penetration.

Methods: We included longitudinal ARV utilization data from participants of the publicly funded HIV Drug Treatment Program in British Columbia (BC). Participants received ARVs between the fiscal years 2014/2015 and 2019/2020. We modelled usage of 20 brand and generic ARVs. The outcome was the proportion of participants who received each drug per fiscal period. The outcome was modeled assuming a beta distribution.

Results: The number of unique participants increased from 6520 in the first period of 2014/2015 to 7421 in the last period of 2019/2020 (14% increase). From 2014/15 to 2018/19, utilization of most ARVs declined with the exception of BIC/FTC/TAF, DRV/COB, DTG, DTG/ABC/3TC, EVG/COB/FTC/TAF, EVG/COB/FTC/TDF, and FTC/TAF. In 2019/2020, integrase inhibitors had 49% of the market share, and in the next two years, this is estimated to increase to 61%. Several generic products were marketed in 2017/2018, and the proportion of the market share of generics increased from 16% in 2017/2018 to 68% in 2019/2020, with ABC/3TC and FTC/TDF holding the majority of the generic market. However, current trends suggest that the utilization of generic products will decrease by 33% by 2021/2022.

Conclusions: There has been a significant shift in ARV usage in BC. Consistent with evolving guidelines, we have seen a marked shift towards the use of integrase inhibitors-based regimens, which now dominates the market share in BC. We have also seen a recent declining penetration of generic ARVs, yielding a high economic impact.

212

At-Home HIV Self-Testing during COVID:

Overview of the GetaKit Initiative in Ottawa

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Background: Access to HIV testing in Ontario continues to be limited as a result of COVID-19. However, people continue to engage in sexual contact with new partners, presenting the risk of increased HIV transmission. To close this gap, a team of nurses at the University of Ottawa and Ottawa Public Health and staff from Ottawa ASOs and the OHTN launched a mail-out HIV self-testing project.

Objectives: 1) To assess the feasibility and accessibility of an HIV self-test kit in the Ottawa region, and 2) to determine the impact of the GetaKit program on HIV diagnosis rates and linkage to care.

Methods: The research team obtained Health Canada's Special Access approval April 23, 2020 to distribute bioLytical's INSTI HIV self-test in Ottawa. The team received REB approval May 15, 2020. As of July 20, 2020, eligible participants (≥18 years old, HIV-negative, not on PrEP, not in a HIV vaccine trial, living in Ottawa, no bleeding disorders) could register via www.GetaKit.ca to order kits.

Results: As of December 2020, 825 persons completed the eligibility screener; 63.9% (n=527) were eligible. Of eligible participants, 275 completed baseline surveys and 259 ordered a test. Approximately 26% (n=68) of participants had no prior HIV testing or were unsure of testing history. Approximately 66% (n=171) of participants belonged to a priority group for HIV testing. We have results for approximately 70% (n=182) of participants who ordered a kit: none were positive, 143 were negative, 36 were invalid, and 2 "preferred not to say". 61.3% (n=159) patients were referred for PrEP.

Conclusions: Our results show that HIV self-testing is an effective strategy to ensure access to HIV testing and prevention among regular and new testers. Lessons learned include the need for increased guidance on the self-collection of blood samples, ASO staff support, and flexible communication strategies for clients.

126

Is PrEP associated with bacterial STIs among gay, bisexual and other men who have sex with men (GBM)? PrEP and sexual risk behaviours in Montreal, Toronto and Vancouver

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Background: Although Pre-Exposure Prophylaxis (PrEP) is a proven biomedical intervention to prevent HIV acquisition, GBM PrEP users may be more likely to engage in sexual behaviours that could lead to increased bacterial STIs. We examined the associations between PrEP use, CAS, MSP and laboratory-confirmed bacterial STI diagnosis among HIV-negative GBM living in Montreal, Toronto, and Vancouver.

Methods: Using the baseline data from the HIV-negative GBM in Engage (N=2,449), a cohort study of GBM recruited using respondent-driven sampling based study of GBM, we fit a structural mediation model (with weighted least squares means and variance-adjusted estimator) of the associations between any PrEP use (No/Yes) in the past 6 months (P6M), any multiple sex partners (MSP) in the P6M, any condomless anal sex (CAS) in the P6M, and any bacterial STI diagnosis (syphilis, gonorrhea, chlamydia) at the study visit. We estimated direct and indirect paths from PrEP use to STI via 1) CAS, and 2) MSP. Models were adjusted for age, race/ethnicity, income, marital status, sexual orientation, city and RDS-recruitment related clustering.

Results: Of 2,007 self-reported HIV-negative/unknown GBM, 18% reported PrEP P6M and 17% were diagnosed with a bacterial STI. The initial model without CAS and MSP demonstrated a direct effect of PrEP use to STI diagnosis (β=.15; p=.002). In the mediated model, the direct path from PrEP use was non-significant (β=.02; p=.75). The indirect path from PrEP use to STI via CAS was significant (β=.10; p=.003) and the indirect path via MSP was non-significant (β=.03; p=.34),

Conclusion: PrEP use may be associated with bacterial STI diagnosis partially because PrEP users may be more likely to engage in CAS than non-PrEP users. The results underscore the importance of providing counselling to PrEP users about bacterial STIs, and ongoing efforts to test PrEP users for bacterial STIs or consider bacterial STI PrEP/dual PrEP.

168

HIV Transmission Dynamics Among Gay, Bisexual, And Other Men Who Have Sex With Men In Montreal Between 1975-2017: A Mathematical Modelling Study

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Background: In 2017, Montreal became the first Canadian Fast-track city, adopting the goal of HIV elimination (zero new infections) by 2030. Gay, bisexual, and other men who have sex with men (gbMSM) are disproportionately affected by HIV. To inform elimination efforts, we describe how HIV transmission dynamics evolved among Montreal gbMSM over 1975-2017.

Methods: Key biobehavioural surveys were reviewed. The time-location Argus surveys (2005; n=1,957; 2008; n=1,873) were standardized to the respondent-driven sampling Engage survey (2017; n=1,179). We developed, parameterized, and calibrated (using an ABC-SMC algorithm) an agent-based model of HIV dynamics among gbMSM in Montreal. Partnership dynamics, HIV transmission/progression, and the scale-up of condoms, testing, treatment, and prophylaxis were modelled.

Results: The modelled incidence peaked in 1985 at 2.0% (90%CrI: 0.9-2.9%) and decreased to 0.2% (90%CrI: 0.02-0.4%) in 2017. Between 1975 and 2017, HIV acquisition was 5-11 times greater in the higher-activity group (>10 partners year^(-1)) than the lower-activity group (<5 partners year^(-1)) and 2-3 times greater among men aged 35-44 years than 15-24 years. Over 1990-2017, higher-sexual activity gbMSM transmitted ~90% of all HIV infections annually. Furthermore, the annual proportion of infections from those in the primary stage of infection increased from 12% (90%CrI: 5-22%) to 18% (90%CrI: 0-43%). Finally, our results suggest that between 1996-2017, among gbMSM living with HIV, the undiagnosed fraction was reduced from 73% to 5%, the untreated fraction from 60% to 4%, and the proportion who discontinued ART from 6% to 3%. Transmissions from those undiagnosed fell from 66% to 35% but rose among those who had discontinued ART at the time of transmission from 2% to 27%.

Conclusions: HIV incidence in Montreal has decreased to low levels with the strengthening of the HIV care cascade. HIV elimination, however, requires a focus on core subgroups and to address remaining prevention needs.

193

Accessing needed sexual health service during the initial phases of the COVID-19 pandemic in British Columbia (BC)

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Background: The COVID-19 pandemic impacts on sexual health services access have not been fully examined. We sought to identify factors associated with unmet sexual health needs and access barriers during BC's initial phases of the pandemic.

Methods: An anonymous online survey about sexual health service needs and access was administered from July 21-August 4, 2020 to clients ≥ 16 years old who had visited the BC Centre for Disease Control's sexually transmitted infections (STI) clinic and/or GetCheckedOnline testing service in the year prior to March 2020. We used logistic regression to identify factors associated with unmet sexual health needs (i.e., not accessing needed services) during March–July 2020, and report unadjusted odds ratios (OR) with 95% confidence intervals [95% CI].

Results: Of 1198 respondents, 59% (n=706; median age: 32 years, 71% White, 47% women, 27% men having sex with men only (MSM)) reported needing sexual health services since March 2020, of which 52% (365/706) did not access needed services. Women (OR=1.37 [1.01-1.86]) were more likely to have unmet sexual health needs, while MSM (OR=0.37 [0.23-0.61]) were less likely to. Participants needing routine STI testing were more likely to report not accessing services (OR=2.49 [1.64-3.79]), whereas those needing birth control (OR=0.48 [0.30-0.75]), HIV pre-exposure prophylaxis (OR=0.39 [0.22-0.66]), or treatment for a new STI (OR=0.40 [0.21-0.76]) were less likely to report not accessing services. Most common reasons for avoiding/delaying service access were: concern about getting COVID-19 while at or traveling to a clinic/lab (249/689, 36%), public messaging against seeking non-urgent healthcare (239/689, 35%), and closure of usual place of service (182/689, 26%).

Conclusion: Many existing sexual health service clients in BC did not access needed sexual health services during the COVID-19 pandemic. Offering alternative service delivery methods and more nuanced public health messaging may help address the identified barriers to improve access.

188

Intention to Vaccinate and Key Population Membership for Early COVID-19 Immunization by HIV status among a Provincial Sample of Women and Gender Non-binary Individuals in British Columbia, Canada

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Background: Among people living with HIV (LWH), risks of SARS-CoV-2 infection and outcome severity may be driven by social disparities and comorbidities. The National Advisory Committee on Immunization considers such disparities in prioritizing key populations for early COVID-19 immunization. Among a provincial (BC) sample, we examined the distribution of social disparities, comorbidities, and intention to receive the COVID-19 vaccine by HIV status.

Methods: Individuals (25-69y) recruited from large province-wide research cohorts completed an online survey examining COVID-19 impacts (August 20-December 15, 2020). Among women and gender non-binary respondents, we measured disparities, comorbidities, and intention to receive a recommended COVID-19 vaccine (Very likely/Likely vs Neutral/Unlikely/Very Unlikely) by self-reported HIV status. Multivariable logistic regression assessed the independent effect of HIV status on vaccine intention.

Results: Of 5031 respondents (mean age=51 [SD=11]), 67 (1.33%) were LWH, of whom 82.1% were on antiretroviral therapy and 76.1% reported an undetectable viral load. Compared to those not LWH, individuals LWH were significantly more likely to identify as Black, Indigenous, or other People of Colour (41.8% vs 16.3%;p<0.0001), report a household income <$20,000/year (17.9% vs 2.2%;p<0.0001), and report living with ≥1 comorbidity in addition to HIV (82.1% vs 50.6%;p<0.0001). Respondents LWH and not LWH did not differ by age or essential worker employment (26.9% vs 32.3%;p=0.43). Intention to vaccinate was significantly lower among respondents LWH (67.2% vs 78.9%; p=0.017. OR:0.53; 95%CI:0.29-0.96). However, after adjustment for ethnicity, income, and comorbidities, LWH was not significantly associated with intention to vaccinate (Adjusted OR:0.90; 95%CI:0.49-1.64).

Conclusions: In adjusted analyses, HIV status was not associated with COVID-19 vaccine intention. However, only two-thirds of respondents LWH reported intending to vaccinate, despite a higher proportion belonging to populations prioritized for early COVID-19 immunization. An equity lens and better understanding of vaccine hesitancy are critical for prioritizing and promoting COVID-19 vaccine uptake among key populations.

192

Increased Economic Hardship due to the COVID-19 Pandemic among Participants of the OHTN Cohort Study (OCS)

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Background: Public health measures introduced to combat the COVID-19 pandemic have resulted in increased economic hardship (i.e., loss of employment or reduction of work hours, loss of housing, or increased difficulty meeting basic needs of life) for people living with HIV in Ontario. We examined the characteristics of people living with HIV who experienced increased economic hardship due to the pandemic.

Methods: The OCS is a cohort of people receiving HIV care at 13 clinics across Ontario. Clinical data is collected through chart abstraction and linkage with the Public Health Ontario Laboratory database. Participants also complete an annual interviewer-administered questionnaire; since May 2020, questions were added to assess the economic and social impacts of the COVID-19 pandemic. We used multivariable logistic regression to identify demographic characteristics associated with increased economic hardship.

Results: Between May and December 2020, 1149 people (median age: 53 years) were interviewed. Most were men (76%), White (61%), born in Canada (63%), and gay/bisexual/lesbian/queer (67%). One-fourth (n=287) experienced increased economic hardship with significantly ($p<0.05$) higher percentage among women than men (30.7% vs. 23.1%) and among Latin American (38.9%), East Asian/South East Asian/South Asian (28.6%), and African/Caribbean/Black (28.1%) than White (21.8%) participants. In multivariable analyses, immigrant women were more likely to experience economic hardship (aPR=1.65, 95% CI: 1.08-2.53, p=0.021) than Canadian-born women; whereas, among men, gay/ bisexual/queer sexual identity was associated with higher odds (aPR=1.56, 95% CI: 1.04-2.35, p=0.033) and older age was associated with lower odds of economic hardship (aPR=0.74, 95% CI: 0.68-0.81, $p<0.001$).

Conclusions: Among people living with HIV in Ontario, immigrant women, younger men, and men who identified as gay, bisexual, or queer men experienced increased economic hardship due to the COVID-19 pandemic. Linking people experiencing economic hardship with available economic support programs should be considered as part of HIV care and services.

26

"It gets people through the door": A qualitative case study of the use of incentives in the care of people at risk or living with HIV in British Columbia, Canada

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Background: There has been growing interest in the use of incentives to increase the uptake of health-related behaviours and achieve desired health outcomes at the individual and population level. However, the use of incentives remains controversial for ethical reasons. An area in which incentives have been not only proposed but used is HIV prevention, testing, treatment and care.

Methods: The main objective of this qualitative case study was to document the experiences of health care and service providers tasked with administrating incentivized HIV testing, treatment, and care in British Columbia, Canada. A second objective was to explore the ethical and professional tensions that arise as well as strategies used to mitigate them. We conducted interviews with 25 providers and 6 key informants.

Results: Our findings suggest that incentives target populations believed to pose the most risk to public health. As such, incentives are primarily used to close the gaps in the HIV Cascade by getting the "right populations" to test, start treatment, stay on treatment, and, most importantly, achieve (and sustain) viral suppression. Participants considered that incentives work because they "bring people through the door." However, they believed the effectiveness of incentives to be superficial, short-lived and one-dimensional – thus, failing to address underlying structural barriers to care and structural determinants of health. They also raised concerns about the unintended consequences of incentives and the strains they may put on the therapeutic relationship. They had developed strategies to mitigate the ensuing ethical and professional tensions and to make their work feel relational rather than transactional.

Conclusions: We identify an urgent need to problematize the use of incentives as a part of the HIV Cascade agenda and interrogate the ethics of engaging in this practice from the perspective of health care and service providers.

131

Visualizing inequities across the Manitoban HIV care cascade: A novel application of the equiplot

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Background: Annual rates of new HIV infections in Manitoba are consistently higher than the Canadian average and disproportionately reported among females, Indigenous-identifying individuals, and people who inject(ed) drugs. Given this heterogeneity in acquisition, it is of interest to understand whether inequities in HIV care and treatment outcomes exist across Manitoba.

Methods: Using a sample of 703 cohort participants of Manitobans living with HIV (data current to the end of 2017), we conducted cross-sectional, disaggregated analyses of the HIV care cascade. We used equiplots to identify and visualize disparities across the cascade, and multivariable logistic regression to quantify associations between equity variables (age, sex, geography, ethnicity, immigration status, HIV exposure category) and progression along the cascade (in care, retained in care, on treatment, virologically suppressed). Adjusted odds ratios (AOR) and 95% confidence intervals (95%CI) are reported.

Results: The proportion of participants in each cascade step is greatest for those who are older, white, non-immigrant, living in eastern Manitoba or have never injected drugs (Figure). Compared to Winnipeggers, eastern Manitobans have greater odds of virologic suppression (AOR[95%CI]=3.8[1.3-11.2]). Indigenous participants are half as likely to be virologically suppressed than white participants (AOR[95%CI]=0.5[0.3-0.7]); African/Caribbean/Black participants are less likely to be in care (AOR[95%CI]=0.3[0.2-0.7]) and retained in care (0.4[0.2-0.9]).

Conclusions: Inequities exist across the Manitoban cascade. Our analyses generate hypotheses for future research into why inequities exist and contribute to evidence that can inform care plans that meet the needs of diverse client subgroups and advocate for policy changes supporting equitable HIV care across Manitoba.

155

Facilitators of and barriers to accessing to HIV prevention, testing, and treatment among street-involved youth in Canada: a mixed methods descriptive study

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Background: One third of Canadians diagnosed with HIV are youth (ages 16 to 29). Among young people in Canada at greatest risk of HIV infection are lesbian, gay, bisexual, transgender, queer, questioning, and Two-Spirit (LGBTQ2S) youth. Youth also have among the lowest uptake of HIV services. The Peer Navigator Project is studying the adaptability and scalability of Peer Navigation (PN) as an innovative model to increase access and uptake of HIV prevention, testing, and treatment by street-involved youth (SIY) in Canada (London, Toronto & Montreal) and Kenya (Kitale & Eldoret). The objectives of this analysis are a) to describe barriers to and facilitators of accessing HIV services among SIY populations in the Canadian sites; and b) identify the appropriateness and acceptability of the PN model.

Methods: Key informant interviews, focus groups and theatre testing were conducted from September 2018 – September 2020 with SIY, healthcare providers, and community stakeholders in the three sites. We utilized a thematic approach and the socio-ecological theoretical framework to guide and interpret qualitative findings.

Results: Fifty-four interviews, 9 focus groups, and 7 theatre-testing presentations were conducted. Barriers to and facilitators of accessing HIV services were described across societal, public policy, institutional, inter-personal, and individual levels. Primary barriers identified were intersectional stigma and discrimination, issues related to official identification of SIY, lack of knowledge, training, and LGBTQ2S inclusivity among healthcare providers, ineffective and sometimes harmful communication among healthcare providers, lack of social support, lack of basic needs, lack of self-esteem, fear, lack of trust, and competing priorities. Facilitators included free and anti-discriminatory healthcare services, patient-centered care models, system navigation and peer support, and individual self-efficacy.

Conclusion: Multiple modifiable barriers and facilitators were identified by stakeholders across all levels of the socioecological model. The PN model was found to be highly acceptable and appropriate for this population.

165

Overlapping HIV-1 Transmission Networks Among Men Who Have Sex with Men and Female Sex Workers Accessing the Sex Worker Outreach Program (SWOP) in Nairobi, Kenya

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Background. HIV prevention is increasingly targeting key populations at risk of HIV even within generalized epidemic settings. Both paid and unpaid sex with women is commonly reported among African MSM and anecdotal reports suggest that MSM sex workers and female sex workers (FSW) share clients at common hotspots. Therefore, overlapping sexual networks could play an important role in shaping the wider HIV epidemic, but transmission dynamics remain poorly understood. Here we utilize phylogenetic analysis to better understand HIV transmission among MSM and FSW accessing the Sex Worker Outreach Program in the central business district of Nairobi, Kenya.

Methods. Blood was collected in consecutively sampled MSM (n= 165) and FSW (n= 746) living with HIV as part of routine treatment provided by SWOP between 2017-2019. HIV pol gene was sequenced using an in-house HIV drug resistance mutation genotyping assay. Phylogenetic clusters were inferred using patristic distance between sequences measured on phylogenetic trees. Effective population size estimates were inferred using an MCMC analysis as implemented in BEAST v1.10.4.

Results. We amplified 511 HIV pol sequences of the 911 (56.1%) available specimens. A majority of MSM sequences (65.2%) were part of a cluster while only 22.0% of FSW sequences clustered. A total of 58 clusters were inferred ranging from 2-9 individuals in size. Most clusters were exclusively FSW (n=29) or a mixture of FSW and MSM (n=25). Only four clusters were exclusively MSM. Effective population size estimates suggest that HIV among MSM grew exponentially around 2006, peaked in 2008, and remained stable until 2019. A similar trend was observed among FSW except the initial phase of growth occurred around 2009.

Conclusion. Clustering between MSM and FSW sequences suggests a significant overlap between key population transmission networks. HIV transmission within MSW and FSW follow similar trajectories suggesting transmission occurred mainly before SWOP's existence.

227

Everyday racism: associated factors and health-related outcomes among ACB men in Ottawa and Windsor, Ontario

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“Excellence is the best deterrent to racism” and addressing racism will ease access to health care by everyone and reduce HIV epidemic. We identified associated factors of increased counts on types of everyday racism experienced by ACB men in Ottawa and Windsor, Ontario. We also determined the health-related outcomes of the racism experienced. Data (Ottawa, n= 210 and Windsor, n=156) were drawn from a broader weSpeak program. Counts of everyday discrimination self-reported as due to racism were five types: i) being treated with less courtesy, ii) receiving poorer services, iii) people acting as if you are not smart, iv) people acting as if they are afraid of you, and v) being threatened or harassed. Because no city-level effect was found, we employed Poisson regression analysis to determine predictors of everyday racism, and a bivariate spearman’s rank correlation to estimate the health-related outcomes the everyday racism. Over 50% of the men in Ottawa (n = 114, 54.3%) and Windsor (n=100, 64.1%) experienced 1 to 5 types of everyday racism. An ACB man in full-time employment experienced 1.56 times ($p < .001$, 95% CI = 1.27/1.93) more of types of everyday racism than those not in full-time employment. Being a Muslim relative to non-Muslim increased the types of racism by 1.48 times ($p < .01$, 95 CI = 1.15/1.91). For a unit increase in traditional masculinity score, 1.03 times ($p < .01$, 95 CI = 1.01/1.05) more types of everyday discrimination were experienced. Results of bivariate correlation analysis show that everyday racism increased difficulty accessing health care ($\rho = .21$, $p < .01$, 95% CI = .07/.37) and reduced self-rated health score ($\rho = -.19$, $p < .01$, 95% CI = -.30/-.08). We recommend holistic approaches to addressing racism from places of employment to health care systems through targeted antiracism workshops and community-driven antiracism campaigns.

210

Sexual relationship power, condom use and violence among women living with HIV in Canada

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Background: The impacts of low sexual relationship power (SRP), including the consequences of having a controlling partner, has not been widely explored among women living with HIV (WLHIV). We measured the psychometric properties, prevalence, and key outcomes (condom use and violence) of the relationship control (RC) SRP sub-scale among Canadian WLWH.

Methods: We used baseline data from WLWH (≥16 years) reporting consensual sex in the last 6 months enrolled in the Canadian HIV Women's Sexual and Reproductive Health Cohort Study. Relationship control was measured using original scoring from Pulerwitz's (2000) 16-item RC sub-scale and dichotomized into low/medium [score=1-2.82] vs. high RC [score=2.82-4], with higher scores reflecting less controlling behaviour from partner. Exploratory factor analysis and Cronbach's alpha assessed scale reliability. Crude and adjusted logistic regression examined associations between RC and condom use (inconsistent and never vs. consistent) and experiencing recent (last 3 months) and previous but not current vs. never violence (sexual, physical and/or emotional), controlling for potential confounders.

Results: Overall, 473 WLWH (33% of cohort) were included in this analysis. Median age=39 (IQR=33-46), 81% were on antiretroviral therapy, and 78% reported an undetectable viral load. The RC sub-scale demonstrated good reliability (Cronbach's alpha=0.92) with items loading onto one factor. 80% had high RC. WLWH with high (vs. low/medium) RC were more likely ($p<0.05$) to have higher education, less difficulty meeting monthly expenses, and no children. In multivariate models, higher RC was associated with less inconsistent (aOR:0.34(95%CI:0.15-0.76)) and never (0.27(0.10-0.71)) vs. consistent condom use; and reduced experiences of current (aOR=0.09(0.03-0.28)) (vs. never), but not previous violence.

Conclusions: Findings highlight that the relationship control sub-scale is a valid and reliable measure for examining relationship power equity among sexually active Canadian WLWH. Programs that prioritize building safety and support for women are critical to addressing violence and promoting positive sexual health outcomes.

86

“It Interferes with me Getting in Touch my Culture:” Indigenous Women with CHIWOS-PAW Speak Out about Denial of Culture in Healthcare

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Background: Indigenous women living with HIV (IWLWH) have the highest attrition rates across the HIV care cascade in Canada, highlighting a need to improve access to HIV care and services. This begins with listening to IWLWH to understand how they understand health, and their experiences accessing healthcare.

Methods: The Canadian HIV Women’s Sexual and Reproductive Health Cohort Study – Positive Aboriginal Women (CHIWOS-PAW) invited six IWLWH on the Coast Salish Territories to participate in three gatherings developed by IWLWH: 1) Introductory Virtual Gathering, to share study objectives; 2) Sharing Circle Gathering, a four-day land and water-connecting art workshop with Sharing Circles, guided by IWLWH; 3) Heart-to-Heart Chats, to connect with each woman who participated to confirm her voice and priorities are shared accurately.

Results: IWLWH who participated in CHIWOS-PAW reported experiences of their culture being denied within the Western healthcare system, with serious consequences. IWLWH described understanding their health through traditional ways of knowing and blood memory, which conflicts with a Western notion of ‘health.’ Care was then compromised when the healthcare provider was unwilling to listen to what women needed for their own healing, and what they felt comfortable with. By denying women their traditional approaches to health and healing, it actively denied women agency over their own bodies, and it interfered with them connecting to their culture. This resulted in a ‘tug-of-war’ phenomenon, where women felt that they were getting pushed and pulled in two different directions - to comply with Western medical care, or to stay true to their culture - rather than providing an opportunity for synergistic approaches to healing.

Next Steps: IWLWH face discrimination and colonialism within healthcare settings, which actively denies women their culture. IWLWH share messages to their healthcare providers to educate how they can be a supportive partner in their healthcare journey.

34

“They give you a bus ticket and they kick you loose”: narratives from women living with HIV post-release from incarceration in Metro Vancouver, Canada

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Background: Women living with HIV (WLWH) make up a growing proportion of people who are incarcerated globally and in Canada. Post-release from correctional settings WLWH experience significant challenges, including gender disparities with regards to HIV outcomes. This qualitative study investigated the experiences of transition from prison to community among WLWH.

Methods: Drawing from SHAWNA (Sexual Health and HIV/AIDS: Women’s Longitudinal Needs Assessment), a community-based research project with cisgender and transgender WLWH in Metro Vancouver, experienced peer and community researchers conducted 19 semi-structured interviews (May-December 2017) with recently incarcerated participants. These were supplemented by interviews with service providers. Interviews explored factors that shape incarceration trajectories, including a focus on release and post-release experiences. Drawing on socio-ecological frameworks, transcripts were coded in NVivo.

Results: Narratives highlighted intersecting structural barriers transitioning from prison to the community, including limited pre-release planning, a lack of immediate support at release (e.g. clothing and transportation) and barriers accessing safe housing and addictions treatment. Participants’ narratives indicated that incarceration experiences were highly disruptive; sustained cycles of criminalization and re-incarceration; and perpetuated symbolic violence, leading WLWH to blame themselves for not being able to break the cycles of criminalization. The lack of structural supports post-release was linked to interruptions in HIV treatment and care for some WLWH. Several participants recounted experiences with HIV-specific prison outreach programs and highlighted the significant benefits of these programs in accessing housing, addiction treatment and HIV care.

Conclusion: To improve HIV health outcomes and overall well-being for WLWH following incarceration, there is a critical need for increased transition supports from prison to community.
Enhanced pre-release planning, with a priority on housing and addictions treatment options, and collaboration between prison staff, community, and HIV providers is critical to enhance supports and access to care and reduce re-incarceration. Interventions should be gender-sensitive, culturally safe, and trauma-informed.

174

Using Fuzzy Cognitive Mapping to Identify Factors Promoting Women's Satisfaction with HIV Care

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Background: Fuzzy Cognitive Mapping (FCM) is a participatory research method that takes into account different sources of knowledge. In this study, we used FCM to capture the experiential expertise of women living with HIV to better understand their healthcare priorities. The objectives of this study were to identify factors that promote women's satisfaction with HIV care.

Methods: Two Peer Research Associates were trained in FCM interviewing and lead the exercise with participants. Using community-based participatory approaches, individual FCM interviews are conducted virtually with women living with HIV in British Columbia and Quebec (n=24). A Fuzzy Cognitive Map was first constructed from a systematic mixed-studies review of factors promoting satisfaction with HIV care among people living with HIV in high-income settings. During the interviews, women individually update the map by adding and removing factors, specifying causal relationships, and assigning weights between 1 and 5 to indicate the importance and direction (+ve or -ve) of the relationships.

Preliminary results: In preliminary findings from completed interviews, the most important promoters of satisfying HIV care were transparent, collaborative and positive relationships between women and their healthcare providers, healthcare provider expertise and training, and receiving care that adapts to each woman's unique needs. Other important factors that indirectly promoted satisfying HIV care were the coordination and communication between various healthcare services that women receive, receiving appropriate gynecologic care, and healthcare services that are informed by women-specific HIV research.

Conclusions: The maps illustrate the most important factors that contribute to satisfying HIV care from the perspectives of women living with HIV in Canada. Applying an innovative method to visualize women's knowledge and experiences, this study will highlight priority areas for co-designing healthcare services that align with the needs of women living with HIV.

163

Utilizing an Indigenous and gender-based lens to critically examine & identify solutions to the crises within a crisis faced by federally incarcerated Indigenous women during COVID-19

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When COVID-19 was first declared a global pandemic in March 2020, it quickly became obvious that the most marginalized populations would experience disproportionate challenges and negative outcomes as a result of the virus and the unrelenting pressure it has placed on already strained social supports and health services. In the time that has passed, the tale of multiple pandemics has become clear: COVID-19 isn't creating social and health inequities, but merely exposing the existing inequalities and gaps in society that has long failed to protect its most vulnerable members.

In Canada, Indigenous women represent over 41% of federally incarcerated women, despite just representing 4% of the total female population. Epidemiological data shows that Indigenous inmates and federally incarcerated women have been disproportionately impacted by COVID-19. As a result, federally incarcerated Indigenous women are at an elevated risk based on their over-incarceration, gender and ethnicity. As prison lockdowns remain in place and nonessential culturally-safe programming is reduced, incarcerated Indigenous women face not only the health risks posed by COVID-19, but the implications the lack of in-person contact and programming has for their mental health and successful reintegration into society.

NWAC's Walking the RED Path Project faced numerous challenges in adjusting to the cancellation of in-person culturally-safe programming and had to work in creative ways in order to continue reaching prisoners with programming that aims to increase their knowledge of culturally-safe STBBI interventions. Despite this individual success, incarcerated Indigenous women continue to be disproportionately impacted by the chaos COVID-19 has caused. Further to this, as systemic racism continues to result in the criminalization of racialized women which, in turn, increases their presence in penitentiaries, we all must acknowledge the role we have in addressing these crises within a crisis.

77

Kotawe (start a fire): Igniting cultural responsiveness through community-determined intervention research

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Background: The objective of this research project is to understand how Indigenous women in Saskatchewan are integrating the wisdom gained from a variety of recently completed research projects which focus on HIV risk and prevention. This research seeks to determine the intersectionality of Indigenous women's lives, communities, and systems working together to better deliver, sustainable and affordable, integrative care through the development, implementation, and assessment of a community-based intervention practice.

Method: Indigenous methods such as storytelling and research circles were used in this mixed qualitative approach along with culture, language, history, and traditional land-based teachings. This work is grounded in Indigenous Knowledges and cultural practices. Guided by principles of Community-Based Research (CBR) and a Two-Eyed Seeing approach, this intervention research focuses on participants' experiences of ongoing, long-term Cultural Intervention Practices (CIPs) scheduled in relationship to women's seasonal teachings and ceremonies. NVivo software and the Nanâtawihowin Âcimowina Kika-Môsahkinikêhk Papiskîci-Itascikêwin Astâcikowin (NAKPA) method were used to analyze the data. This oral presentation will share key themes learned thus far in the research and preliminary data analysis from the research circles to begin the process of knowledge dissemination.

Data was gathered seasonally by asking the women to answer four questions about their wellness as it pertains to them personally: 1) How do Indigenous women experience CIPs? 2) In what ways, if any, do CIPs influence how women experience physical wellness through fitness/strength, stress level, aches, and pains, etc.? 3) In what ways, if any, do CIPs influence how women experience relationships with themselves and/or spirit change? 4) What do women do to encourage wellness in their lives after participating in the CIPs?

Results: Nanâtawihowin Âcimowina Kika-Môsahkinikêhk Papiskîci-Itascikêwin Astâcikowin [NAKPA] follows an Indigenous Research Methodology and will be utilized during analysis. The preliminary findings from this project will be discussed at CAHR 2021.

242

Community Perspectives on Adressing and Responding to HIV/AIDS among African, Caribbean, and Black (ACB) People in Ontario

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The disproportionate impact of HIV/AIDs in African Caribbean and Black (ACB) communities in Canada remains a problem that requires targeted efforts. In this session, we present qualitative findings from the African Canadian (AC) study of HIV behaviours, knowledge, and barriers to healthcare among ACB communities in Ontario. The study meaningfully engaged ACB community members in the interpretation of quantitative study findings and in the generation of best practices. Qualitative data sources included a two-day World Café event where study findings were presented and 12 Focus Group Discussions (FGDs) involving over 107 ACB individuals from Toronto and Ottawa were held. FGDs were transcribed verbatim and thematic analysis guided data interpretation. Credibility of data was established through data validation strategies. Five key themes will be discussed: 1) Community perceptions of research importance and challenges, 2) Factors associated with HIV vulnerability, 3) Experiences with HIV testing, 4) Use of PEP and PrEP, and, 5) Community perspectives on how to address HIV in ACB communities. Fear and stigma remain one of the most frequently cited reasons why ACB community members don't access HIV testing. Many participants were not aware and /or did not have direct experience with use of PrEP/PEP prevention treatments; one of the main reasons being because these treatments are marketed for white gay men. Participants identified numerous strategies to address the HIV needs in ACB communities, including education, community-level strategies and health provider capacity building strategies. The implications of the qualitative study findings for ACB community, service provision, research, funding and policy action areas will be presented. We conclude that community based participatory research, co-led by community members, is an important strategy for identifying the multi-level individual, interpersonal, community, institutional and structural factors that increase HIV vulnerability in ACB communities, notably anti-Black systemic racism.

151

A Review of the use of Participatory Methodologies in Indigenous STBBI Research: Towards Learning from Others and Improving Research Practices

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Aim/Objective: The current political and social realities of Indigenous life in Canada requires thoughtful and respectful approaches to health research that inspire positive transformational change. To achieve this, health research in participatory methodologies that meaningfully involve Indigenous peoples in health research is needed. The goal of this rapid review was to examine wise practices in participatory methodologies as an approach to STBBI Indigenous research across four pillars of health (basic, clinical, epidemiological, and social sciences).

Methods: This review adopted a rapid review protocol to gather relevant literature. Articles were identified in various databases. Those included in the final analysis contained an exclusive focus on Indigenous peoples, used a participatory methodology, and contained a comprehensive theoretical section. Data from the articles were charted and coded based on criterion provided from the Critical Appraisal Skills Programme [CASP] qualitative checklist. The sections were then collaboratively analyzed to identity emerging themes.

Findings: This review included 37 articles in the final analysis which were coded to identify common themes. Central themes included participatory methodologies (i.e., patient oriented, community-based, community-based participatory, and action research), Indigenous partnership and participation, use of Indigenous language, ceremony in research, and knowledge translation.

Implications/Discussion: Supported by the Feast Centre for Indigenous STBBI research, we are especially interested in how specific tenets of participatory methodology-based research are operationalized and how participatory methodologies change within a decolonizing and Indigenous perspective across each of the four pillars of health research. Given the diverse populations of Indigenous peoples living in Canada, no standardized framework can be provided. However, common practices and translations of Indigenous worldviews in participatory methodologies have been compiled. The findings of this research will be used, but not limited to, develop training sessions, webinars, and toolkits to support various projects funded by the Feast Centre.

36

"You Should Have Approached Me Before I Wrote my Will": Older People with HIV's Willingness to Participate in End-of-Life Cure Research in Canada

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Background: HIV cure research requires biopsies of deep tissues. Unfeasible in living participants, these biopsies are obtained post-mortem. End-of-life and post-mortem research, and biobanking, raise ethically sensitive and personal questions. We examined older people with HIV (PWH)' willingness concerning participation in HIV cure research

Methods: Designed with the Last Gift Study (UC-San Diego) and the CanCURE community advisory board, this mixed-method research with PWH aged ≥65 years (N=50) in Montreal, Toronto, and Ottawa involves a survey (multiple choices; 4-point Likert scales) and in-depth interviews for a subset of 16 participants. We describe quantitative results and thematically-coded qualitative results to identify facilitators and barriers.

Results: As of December 2020, 20 participants completed the survey, and 6 completed interviews. Most are cis men (n=19), White (n=18), and born in Canada (n=16). Mean age was 71 years old, with mean duration of living with HIV of 28 years. Three participants reported a terminal illness, i.e., cancer (n=2/20) and cardiovascular disease (n=1/20). Most expressed interest in participating in HIV cure research (17/20), donating tissues to an HIV biobank (16/20), and participating in a research autopsy (n=15/20). Forms of compensation considered as fair by greatest numbers of participants included access to research results generated while living (11/20) and covering cremation/burial costs (6/20). Qualitatively, facilitators included being approached by a trusting healthcare provider, feeling one contributes to science, altruistic/moral motives, and the idea of turning HIV into something positive. Barriers included having already written their will, weariness, concerns about family members (disclosure, disagreement), and needing more time or information.

Conclusion: Preliminary results indicate that approaching PWH for cure research and biobanking should be a continuous, accountable, and empowering process initiated early, before one has taken written their will. Including participants of greater gender and ethnic diversity could lead to more generalizable results and clearer recommendations.

203

GIPA Homefire: Understanding IPHA Leadership towards a Wholistic Response to STBBI

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Background: Involvement of Indigenous People living with HIV/AIDS (IPHAs) is integral in the response to HIV/AIDS within First Nation, Inuit and Métis populations in Canada. The GIPA Homefire project brings together IPHAs, academics, and community researchers to explore how to 'Indigenize' the concepts of the Greater Involvement of People living with AIDS (GIPA) and IPHA leadership.

Methodology: This project applies a mixed method, multi-pronged approach, emphasizing Indigenous ways of knowing, decolonizing research methodologies, Two Eyed Seeing, and principles of Community-Based Research. Questions were informed by a literature review and developed in collaboration with our team. All questions were culturally grounded and inclusive of traditional teachings.

Findings: Our study included IPHAs who have taken on leadership roles in the HIV movement. We have learned that the majority of survey respondents are single and under half are living alone. The majority of respondents earn less than $20,000 per year. A large number of these respondents participate in traditional ceremonies such as smudging, singing, drumming, sweats, traditional crafts, talking with Elders, pow wows, preparing traditional foods, and learning their language. All interview participants to date have indicated that participating with other IPHAs has had a positive effect on themselves and the Indigenous HIV/AIDS movement. This was frequently attributed to reducing stigma, and a sense of connection and/or understanding with other IPHAs. Reciprocally, mentorship and engagement with others has also had a positive impact on IPHAs. Striking changes in the context of leadership have been noted across the decades of engagement in responding to HIV/AIDS.

Next Steps: A review of GIPA related policy documents and organizational leader interviews will compliment the individual survey and interview data. These additional reviews will contribute to understanding how organizations enact GIPA principles. This multi-pronged approach will frame our research findings as action oriented recommendations to maximize positive outcomes.

223

Strengthening capacity of healthcare providers to mitigate the impact of COVID-19 on African Caribbean and Black (ACB) communities

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Background: The COVID-19 pandemic has emerged as an unprecedented challenge for healthcare systems across the world. African, Caribbean and Black communities (ACB) represent vulnerable populations in terms of their health risks, receipt of adequate care and chance of recovery. The increased burden of COVID-19 morbidity and mortality among vulnerable populations translates into greater challenges for healthcare systems through loss of social capital, productive labour force, and erosion of cultural equity.

Purpose: This paper presents preliminary findings of a study that seeks to generate evidence to inform clinical and health system management to mitigate the spread of COVID-19 and related health consequences in racialized communities.

Research Design: This one-year mixed-methods research is guided by socio-ecological model (SEM), intersectionality and community-based participatory research frameworks in Ottawa and Toronto. Healthcare provider (HCP, n= 600) and In-depth individual interviews (IDIs, n=100) on COVID-related knowledge, socioeconomic and health vulnerabilities and health care experiences is being conducted involving ACB people, HCP and policy makers (PM). This paper will focus on the qualitative findings.

Results: Preliminary findings of the qualitative component of the study will be presented. These includes the contextual vulnerability and challenges experienced by ACB communities, healthcare providers' needs to improve quality of healthcare for ACB communities, and promising strategies to mitigate the impact of COVID-19 on ACB communities. Data analysis is in progress.

Discussion and Implications: Actions to mitigate health risks and strengthen the capacity of healthcare systems are necessary to tackle the pandemic and improve COVID-19 pandemic response and must be informed by the realities of vulnerable populations. Our study is generating evidence and interventions to strengthen the health system's capacity and improving critical health literacy among ACB communities.

Keywords: COVID-19; African Caribbean and Black (ACB) communities; Health care providers (HCP); Health system

173

Experiences of Managing Chronic Health Issues among Socioeconomically Marginalized People who Use Drugs

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Background: Self-management is recommended for addressing chronic conditions. Despite calls to consider drug use as a chronic condition, chronic disease self-management supports have rarely been applied to people who use drugs (PWUD). Self-management programs improve health behaviours, outcomes and quality of life, yet it is unclear if PWUD can achieve such benefits. Our objective was to explore the chronic disease self-management and support experiences of socioeconomically marginalized PWUD.

Methods: Using community-based participatory methods with meaningful engagement of five people with lived experience, we developed a qualitative interview guide appropriate for the intended population. Participants self-identified as having long-term experience using drugs illicitly, drug use within the past year, at least one other chronic condition, and current socioeconomic marginalization. We used maximum variation sampling and a peer-led, intersectionality-informed recruitment approach. Data were analyzed using reflexive thematic analysis.

Results: We interviewed 15 participants with diverse characteristics. PWUD reported multimorbidity, especially mental health issues, chronic pain and infectious diseases, along with acute health issues. Although many considered their drug use a chronic health issue, self-medicating with non-prescribed drugs was also a key self-management strategy for other health issues. Participants described numerous other strategies to manage their health issues, such as engaging with community supports, creative pursuits and cognitive-behavioural strategies. Furthermore, participants highlighted substantial barriers to managing their health issues, mostly stemming from socioeconomic instability.

Conclusions: Our findings highlight the need for structural interventions to support self-management among marginalized PWUD, most prominently access to stable housing, safe supply of pharmaceutical-grade drugs and improved pain management. Self-management supports for PWUD should include assorted low-barrier community-based options, peer work or mutual support opportunities, and empowerment to advocate for needs including system-level changes. Overall, self-management initiatives should apply a relational autonomy approach to understand marginalized peoples' experiences, recognizing constraints of social networks, material circumstances, and power relations.

248

Law, HIV Care and Un/Detectability: Social Organization of HIV health Care for African, Caribbean and Black Immigrants Living with HIV in Toronto

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Background: ACB migrants living with HIV face health disparities that increase their burden of living with HIV and impact their effort of access and engagement in HIV care. Despite these gaps, HIV response in Canada currently consists of legal and healthcare policies and practices couched in scientific knowledge of undetectable HIV viral load. This study explored the tensions and disconnections existing between the realities of accessing and engaging in HIV care and how the institutional complex of HIV care is currently organized and determined the health outcome and consequences for ACB migrants living with HIV.

Methods: The study employed Institutional Ethnography as a method of inquiry to conduct 30 in-depth interviews with ACB migrants living with HIV in Toronto and 20 in-depth interviews with health care providers and policy/decision makers involved in the delivering of HIV care in Toronto. Textual analysis of regulations, policies, legislations, and guiding principles connected to HIV care and healthcare in general were also conducted. Mapping of institutional orders s and social relations that organize and coordinate HIV healthcare and treatment was done.

Results: Several issues emerged as presenting barriers to HIV care and attainment of undetectable viral load and optimal health for ACB migrants living with HIV. Physician fee-for -service and lack of health coverage of uninsured services and prescription drugs such HIV medication and treatment of co-infections impact quality of HIV care. Healthcare providers lack of awareness of health risk factors specific to ACB migrants. Legal practices associated with HIV non-disclosure impacts patient-provider relationship. Immigrant status is a barrier to accessing HIV healthcare.

Conclusion: Understanding and addressing the multiple and intersecting structural and socio-cultural factors that significantly impact access and engagement in HIV care and social determinants of health will help improve HIV care and health outcome of ACB migrants living with HIV.

68

Stigma trajectories, disclosure, access to care and peer-based supports among African, Caribbean, and Black im/migrant women living with HIV in Canada

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Background: African, Caribbean, and Black (ACB) im/migrant women experience a disproportionate burden of HIV relative to people born in Canada, yet there is scarce empirical evidence about the social and structural barriers that influence access to HIV care. The objectives of this study are to understand how stigma and im/migration trajectories shape access to HIV care and peer supports among ACB im/migrant women living with HIV (WLWH) in Canada.

Methods: This mixed-methods analysis draws on interviewer-administered questionnaires and in-depth interviews with self-identifying ACB WLWH in the community-based SHAWNA (Sexual Health and HIV/AIDS: Women's Longitudinal Needs Assessment) cohort. Bivariate and multivariable logistic regression using generalized estimating equations (GEE) was performed to model associations between ACB background and outcomes including stigma, HIV disclosure and social support. Drawing on a social and structural determinants of health framework, qualitative analysis of interviews elucidated the interplay between migration trajectories, stigma, racialization, and HIV.

Results: In multivariable GEE analysis, ACB participants (n = 20) were significantly more likely to be outed as living with HIV (AOR 2.20, 95% CI 0.94-5.13; p= 0.068). Reflecting on their im/migration trajectories, participants' narratives (n = 9) highlighted the severe trauma, stigma, and discrimination associated with HIV in their place of origin and the racialization and stigmatization of HIV in Canada. Fear of disclosure without consent was linked to barriers of accessing care and peer-based supports.

Conclusion: Our findings indicate that im/migration trajectories of ACB WLWH are critically related to accessing HIV care and supports in Canada and compound HIV stigma and discrimination. HIV disclosure without consent complicates access to care and social/peer support, underscoring the need for privacy, confidentiality, and the importance of building trust in the context of clinical encounters. The results of this study emphasize the critical need for culturally sensitive trauma-informed care models rooted in peer-based approaches.

32

Aspirin reduces HIV target cells without inhibiting recall immune responses

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Background: Globally 1.7 million new HIV infections occurred in 2019, therefore, new prevention methods are needed. Inflammation is a risk factor for HIV acquisition as it attracts HIV target cells to the female genital tract (FGT). Our lab conducted a study aimed at reducing HIV target cells at the FGT using safe, affordable, and globally available anti-inflammatory drug: acetylsalicylic acid (ASA/Aspirin). We found ASA decreased the proportion of HIV target cells (CD4+CDCR5+Tcells) at the FGT by 35%. However, this decrease in inflammation must not hamper the immune response to other infectious agents.

Hypothesis: We expect ASA to decrease HIV target cells without adversely effecting the immune response to recall antigens.

Methods: Women from Nairobi, Kenya took low dose ASA (81mg) daily for 6 weeks. Blood was drawn prior to ASA and following 6 weeks daily ASA. Peripheral blood mononuclear cells (PBMCs) were isolated, frozen, and shipped to Winnipeg, Canada where they were stimulated with either 2µg/mL CEF (Cytomegalovirus, Epstein Barr, Influenza) or 8µg/mL HPV (Human Papilloma Virus) peptide pools. Stimulations were for 12 hours for cytokine detection or 7 days for proliferation.

Results: Following 6 weeks ASA there was an increase in the pro-apoptotic receptor CD95 in unstimulated CD8+Tcells (p=0.011) with increased IFNγ (p=0.006) and IL-2 (p=0.040), in CD4+Tcells and TNFα in CD4+ and CD8+Tcells (p=0.031, p=0.024 respectively) following HPV peptide stimulation. There was no change with CEF peptide stimulation and no impact of either stimulation on proliferative ability.

Conclusion: We show that the immune response to recall antigens is not impaired by 6 weeks of ASA treatment and may be boosted with HPV peptide stimulation. Our observation that ASA decreases HIV target cells at the FGT without adversely altering the ability of immune cells to respond to recall antigens supports ASA's further assessment as a new HIV prevention tool.

122

Reconceptualizing racism in HIV services accessed by Black communities in Ontario: a theoretical application of critical race theory

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Background: Black populations in Ontario are disproportionately impacted by HIV. This disparity continues despite a robust network of HIV services administering biomedical HIV prevention interventions. HIV research is beginning to implicate anti-black racism in critiquing this disjuncture. However, research typically emphasizes individual-level racism, obscuring structural forms (e.g. institutional practices, policy frameworks, knowledge systems) that continue to limit service access. Subsequently, discourses critical of how racism structurally shapes HIV services remain conceptually underdeveloped in Canadian scholarship.

Method: Critical race theory (CRT) is a theoretical framework that fosters a race consciousness in understanding the social ordering of society and the structural nature of racism. Building on its tenets, a theoretical application of CRT is used here to frame HIV service access barriers for Black communities and to challenge discourses attributing individual-level responsibility to their adverse prevention outcomes.

Results: CRT disrupts discourses of race removed from a context of racism. It critiques social and epidemiological constructs of Black populations as being inherently ‘risky’. In rationalizing suboptimal rates of service uptake, these constructs then hold sexual practices to be a result of poor individual merit. Alternatively, CRT asserts that these stigmatizing racial profiles underscoring service delivery and discriminatory socio-economic systems dually shape safer sex decision-making. Historically contextualizing Black communities as ‘hard-to-reach’, CRT further provokes a shifted focus from this population’s medical distrust to the institutional trustworthiness of healthcare and research settings by integrating past and ongoing unethical medical and research practices. CRT also aims to counter ‘at-risk’ and ‘hard-to-reach’ ‘master narratives’ by centering Black communities’ experiences and perspectives of service access.

Conclusion: With the uptake of research on racism in healthcare, it is important that conceptual tools are able to critically examine its multiple forms in HIV services in Ontario towards informing a coordinated prevention response that synchronously intervenes for structural and behavioural change.

187

Prevalence of Self-Reported COVID Infection, Household Exposure, and Front-Line Work Among People Living With HIV During the COVID-19 Pandemic

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Background: People living with HIV may experience a higher risk of COVID-19 due to the syndemic factors, including disproportionate impact by race and income. We examined syndemic factors, including gender, race, and occupation to assess the risks and exposures in the OHTN Cohort Study (OCS).

Methods: The OCS is a cohort of people with HIV receiving care at Ontario clinics, including clinical and interview-administered in-person or virtual questionnaire data. We assessed the impacts of COVID-19 on participants, through self-report of COVID-19 diagnoses, household exposure, physical distancing, and work outside the home.

Results: Results from 1,1166 responses collected between May 2020 and December 2020, including 276 (23.9%) women, 880 (76.1%) men and 10 missing gender (1%); (Overall median age: 52 years, 61% white, 22% black, 7% Asian). 284 (24.5%) participants were tested for coronavirus in the sample, with 11 testing positive (1.0%; 95% CI 0.3%, 1.5%). 23 people (2%) were told by a healthcare provider that they had COVID-19, with higher percentages among women (11/273; 4%) and Black participants (7/249; 3%). 10 participants (1%) had household contacts who tested positive, with higher percentages in Black participants (7/249; 3%). 332 participants (28%) worked outside the home during the pandemic, with higher rates in women (84/273; 31%), Black participants (92/249; 37%) and Asian participants (29/77; 38%). Relative to White participants, Black and Asian participants were more likely to be working in Healthcare (30/692, 4% White; 31/249, 12% Black; 5/77, 6% Asian) and Manufacturing (8/692, 1% White; 7/249, 3% Black).

Conclusions: Our analyses indicate disparities in the impact of coronavirus. Black people and women living with HIV were more likely to be working outside the home, exposed through household contacts and experiencing coronavirus infection. Asian participants were also more likely to work outside the home in higher risk occupations.

135

Developing a Métis-led cultural response to HIV, HCV and other STBBI grounded in Métis ways of knowing and doing

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There is a lack of Métis-specific resources available for addressing prevention and care for HIV, HCV, STBBI and/or related health issues. Métis communities are often expected to use resources that are adapted from resources developed for, or by, First Nation communities who have different cultural beliefs and norms from Métis communities. To address this gap, as part of the DRUM & SASH implementation science team grant, we are working in partnership with a provincial Métis health service organization based in Alberta to develop a Métis cultural response to HIV, HCV, STBBI and related mental health issues.

The development of a community-led Métis cultural response to HIV, HCV, STBBI and related health issues is grounded in community-based and Indigenous research methodologies that privilege Métis ways of knowing and doing. This cultural response is developing iteratively through reciprocal learning processes, and is guided by Elders/knowledge keepers, with the participation of Métis service providers, community members, and researchers.

Through these processes, 1) community priorities and leaders have been identified; 2) Elders and other community members have developed a holistic conceptual model of Métis health that is grounded in Métis culture, identity, and imagery; 3) language keepers and community members have developed language in Cree-Michif to address wellbeing and STBBIs; 4) the Métis community has successfully piloted Dried Blood Spot testing in Alberta, which included wrap around services for Métis individuals; 5) an advisory committee has been formed to guide future initiatives, and 6) Métis-specific resources have been developed for community including an assessment tool for Métis wellbeing.

Creating a Métis-specific cultural response to HIV, HCV, other STBBI, and related health issues will improve cultural safety and improve access to services, including access to testing and treatment, for Métis communities.

46

Food insecurity and associated HIV vulnerabilities among Northern and Indigenous adolescents in the Northwest Territories, Canada: informing social contextual HIV prevention approaches

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Background: In the Northwest Territories (NWT), food insecurity (15.9%) is nearly double the national prevalence (8.8%). Food insecurity is an established structural determinant of HIV. Food insecurity harms mental health and contributes to maladaptive coping, in turn reducing HIV prevention uptake. Condom use efficacy, a proxy for sexual agency, encompasses knowledge, intentions, and relationship dynamics for negotiating safer sex. We explored the direct effect of food insecurity on condom use efficacy, and indirect effect via resilience, among NWT adolescents.

Methods: We conducted cross-sectional surveys with adolescents aged 13-18 in 17 NWT communities in 2018-2019. We assessed socio-demographics, food insecurity (frequency of going to bed hungry due to insufficient food, dichotomized: ever/never), and resilience (Child and Youth Resilience Measure). We conducted descriptive statistics, bivariate analyses (chi-squared, Mann-Whitney U tests), and tested hypothesized pathways from food insecurity to condom use efficacy using mediation analyses with full-information maximum-likelihood methods to account for missing data.

Results: Most participants (n=410; mean age: 14.3, SD: 1.26) identified as Indigenous (79%), heterosexual (85%), and lived in rural regions outside of Yellowknife (n= 82%); 45% reported any food insecurity. Food insecurity was higher among Indigenous youth (48% vs. 34%, p=0.02). Food insecurity was associated with lower resilience (β= -0.14, p=0.006, 95% CI= -0.23, -0.04), and resilience was associated with increased condom use efficacy (β=0.55, p<0.001, 95% CI=0.45, 0.65). While the direct path from food insecurity to condom use efficacy was not significant (β= 0.03, p=0.53, 95% CI= -0.06, 0.11), the indirect effect via resilience was significant (β= -0.08, p=0.008, 95% CI= -0.13, -0.02). These results signal that food insecurity is associated with lower resilience, that in turn, is associated with lower condom use efficacy.

Conclusion: HIV prevention strategies focused on building individual resiliencies are insufficient to address larger social contexts of food insecurity for Northern and Indigenous youth.

119

Analyzing Canadian Legal Narratives and Representations of Indigeneity in HIV Non-disclosure Cases

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In this talk, I present the findings from an analysis of Canadian legal decisions where Indigenous people have been accused of HIV non-disclosure. The purpose of this research is not to name or identify those who have been accused, rather, the focus is on how Indigeneity, HIV, and law are talked about by those working in the criminal justice system (such as judges and lawyers). This research examines how the narratives in these cases about Indigeneity, HIV, and "the law", are shaped by, and deeply entangled in, settler colonial and heteropatriarchal histories and ongoing practices. However, the legal discussions and decisions are treated as objective, fairly reasoned, and as serving justice and broader social interests. I challenge these representations through an analysis that is informed by Indigenous feminisms and which recognizes Indigenous laws and the plural nature of law on these lands. Discourse analysis is used to draw out dominant representations, as well as to examine silences and that which is marginalized. The key findings will be discussed, including an assessment of how Gladue principles are engaged in the cases, and problems regarding the absence of Indigenous laws in these legal discussions. There is an ongoing need in HIV literature to examine not only how Indigenous people's experiences with HIV are shaped by settler colonialism, but to also closely examine the connections between HIV criminalization and settler colonialism.

220

Grounding HIV, HCV, and STBBI treatment and prevention within First Nation cultures: a community-led, reciprocal learning approach

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It is difficult to address HIV, HCV, and STBBI if these concepts do not exist within a language or culture, which is the case for many First Nation communities. Using a culturally-grounded approach, members of the DRUM & SASH implementation science team grant are working in partnership with several First Nation communities in Alberta to support the community-led creation of a place in the culture for addressing HIV, HCV, STBBI and related health issues that are specific to each community.

Grounded in community-based and Indigenous research methodologies that prioritize First Nation ways of knowing and doing and reciprocal learning, the DRUM & SASH team, which includes First Nation community research partners, has engaged with Elders/Knowledge Keepers and community members to develop community-led initiatives, including the development of traditional language for the discussion of HIV, HCV, STBBI and related topics such as sexual health and sexuality.

The development of traditional language has supported the creation of health promotion materials in local languages and improved communication about sensitive and often taboo topics. Additionally, our team has found that working with Elders and other community members to develop traditional language is an optimal opportunity for reciprocal learning, whereby Elders, community members including health service providers, and DRUM & SASH team members are able to learn from each other – sharing knowledge about language, culture, STBBIs, and concepts of health – all of which contribute to building trust and respectful relationships to further STBBI prevention and treatment.

Without having concepts and language for HIV, HCV, and STBBI grounded within the culture, it is hard to have a cultural response that is effective and culturally safe. Developing a place for HIV, HCV and other STBBI within the culture is essential to curbing the rates of transmission and improving access to culturally safe services and treatment.

24

HIV and HCV Infection among people who inject drugs (PWID) in Eastern Central Canada – 1995 to 2019

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Background: An HIV/HCV surveillance network is ongoing among people who inject drugs (PWID) in Eastern Central Canada (province of Québec and City of Ottawa) since 1995. Data were analysed to estimate HIV and HCV prevalence (2003-2019) and examine trends (over available years) in HIV and HCV incidence and use of syringes previously used by someone else ("used syringes").

Methods: PWID having injected recently (past 6 months) are recruited in harm reduction and health programs. They complete an interviewer-administered questionnaire and provide saliva samples for antibody testing. Multiple visits by a repeater are linked through a unique identifier to measure incidence. The bootstrap method was used for incidence trend analyses. Generalized estimating equations were used for other trend analyses.

Results: As of 03/31/2019, 15,416 PWID had completed 30,086 interviews. Overall, 75.5% were males with a median age of 36 years (females: 30 years). From 2009 to 2019, 68.7% had recently injected cocaine, 63.7% prescription opioids, and 33.7% heroin. HIV prevalence was 12.8% [95% Confidence Interval (95%CI): 12.1-13.5%] and the prevalence of HCV antibodies was 62.1% [95%CI: 61.1-63.2%], with a co-infection rate of 10.9%. Overall HIV incidence (1995-2019) was 1.7 per 100 person-years (PY) [95%CI: 1.5-1.9 per 100 PY; 329 seroconversions among 3,935 repeaters initially HIV-negative] but decreased significantly from 5.0 to 0.3 per 100 PY (1995-2017; p<0.001). Overall HCV incidence (1997-2019) was 19.6 per 100 PY [95%CI: 18.0-21.1 per 100 PY; 633 seroconversions among 1,343 repeaters initially HCV-negative] but oscillated between 28.3 (1999) and 10.0 (2016) per 100 PY for a significant overall decrease (1998-2017; p<0.001). Recent injection with "used syringes" significantly decreased from 43.4% to 12.7% (1995-2018; p<0.001).

Conclusions: The decreasing trends are encouraging. However, the proportion of recent injection with "used syringes" remains a concern. Harm reduction programs must be strengthened to curb both epidemics among PWID.

40

Spotting – Opportunities and challenges to prevent overdose, HIV transmission and other drug related harms

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Background: Spotting is an informal practice among people who use drugs (PWUD) where they witness drug use and respond if overdose occurs for each other. During COVID-19 restrictions, remote spotting (eg., telephone) emerged to address physical distancing requirements and reduced access to harm reduction/HIV prevention services. A few organizations now offer formal spotting services. We explore spotting implementation issues from the perspective of PWUD spotters/spottees.

Methods: Research assistants with lived experience used personal networks/word of mouth to recruit from Ontario and Nova Scotia 21 PWUDs who provided or used informal spotting and 9 who provided or used a formal spotting service. All completed a semi-structured, audio-recorded telephone interview about service design, benefits, challenges and recommendations. Recordings were transcribed and thematic analysis was used.

Results: Spotting is provided on varied platforms (e.g., telephone, facetime, texts) and locations (e.g. home, car), and offers connection, community support, and addresses barriers (e.g., location, stigma, confidentiality, safety, availability, COVID related closures) to the use of supervised consumption sites. Spotting calls often begin with setting an overdose plan (i.e., when and who to call). Many participants noted that due to the criminalization of drug use and fear of arrest they preferred that roommates/family members be called instead of 911 in case of an overdose. Formal spotters are required to call 911 for suspected overdoses. Concerns were raised about the timeliness of overdose response. Almost none of the calls included discussion of HIV prevention and while willing, spotters felt unsure about how to offer HIV/HCV prevention and other harm reduction tips during calls.

Conclusions: Spotting is a novel addition to, but not replacement for, existing harm reduction services. To optimize overdose/COVID-19/HIV prevention services, additional supports (e.g., guidelines, home delivery, changes to Good Samaritan Law) are needed. Criminalization of drug use may limit uptake of formal spotting services.

140

The Implementation of Drug Checking Services for People Who Use Drugs: A Systematic Review

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Background: Drug checking services (DCS) provide people who use drugs with information on the composition of their drugs to allow for more educated choices about their drug use and increase their capacity to avoid consuming lethal amounts of toxic substances. Given recent increasing interest in DCS to address rising overdose fatalities in Canada and elsewhere, we sought to identify and synthesize existing literature on outcomes associated with 1) the influence of DCS on behaviour; 2) use of DCS for drug market monitoring; and 3) models of DCS.

Methods: This review followed PRISMA guidelines and was pre-registered in PROSPERO (CRD42018105366). A systematic literature search was conducted in Medline, Embase, PsycINFO, Scopus, Web of Science, the Cochrane Library, and ProQuest. Eligible studies were peer-reviewed articles or conference abstracts published in any language since 1990 and including empirical research on the outcomes of interest. Grey literature reporting original research related to the primary outcome of interest was also included. We appraised study quality for peer-reviewed articles and conference abstracts reporting on the primary or tertiary outcomes of interest using study quality assessment tools from the National Institutes of Health.

Results: 2,463 titles and abstracts and 156 full texts were screened, with 90 articles meeting inclusion criteria. Most studies (n=63, 70%) were from Europe and used cross-sectional (n=49, 54.4%) and repeated cross-sectional (n=30, 33.3%) designs. Use of DCS for drug market monitoring (n=63, 70%) was most commonly reported, followed by the influence of DCS on behaviour (n=31, 34.4%) and outcomes related to models of DCS (n=17, 18.9%). Behaviour change measures commonly focused on intended behaviours.

Conclusion: Evaluations of DCS are limited in scope and there is a need to expand their designs and outcome measures, with attention to actual behaviours as well as overdose risk behaviours given the use of DCS in overdose prevention.

200

Peer Backpack and Vending Machine (PB&V) Project

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HIV and Hepatitis C rates continue to be on the rise in Saskatchewan. Harm reduction best practices models may suggest there is merit in the exploration of alternative options such as formal secondary distribution and use of vending machines (CATIE, 2015) to improve access of needle use equipment through building capacity of people who have lived experience with the use of injection drugs.

The Harm Reduction Peer Backpack and Vending Machine (PB & V) project is a peer-led improvement project that involves people who inject drugs (PWID) providing needle distribution via backpacks and harm reduction vending machines. The data collected includes surveying clients regarding sharing of used drug use equipment before and after the introduction of the project, and conducting focus groups re: implementation and ongoing use of the project to evaluate their effectiveness of decreasing Hepatitis C and HIV. It aims to increase access to needle equipment by 30% and to increase capacity of secondary distributors (peer backpackers) by 25% for PWID in three rural Saskatchewan communities. The peer backpackers also introduce a backpacker training manual in the form of YouTube videos to support informal secondary distribution amongst PWID in rural communities. The project has also unveiled unexpected benefit of improved relationship amongst PWID and health care professionals. It is the intention that the project will provide important insights, learning lessons and future considerations regarding the effectiveness of formal secondary distribution and harm reduction vending machines on addressing the high rates of Hepatitis C and HIV in rural Saskatchewan.

Key Populations – Epidemiology and Public Health Oral Abstracts / Les populations clés – Épidémiologie et santé publique eposés oraux

158

Changes in the HIV care cascade among gay, bisexual and other men who have sex with men (GBM) in Vancouver: 2012-14 To 2017-19

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Background: British Columbia (BC) has dedicated $48 million in additional annual funding to support expanded HIV testing and improved engagement/retention in HIV care since 2010. We compared HIV care cascade metrics for GBM in Vancouver, across two time-periods 2012-2014 and 2017-2019.

Methods: Participants were sexually-active GBM aged ≥16 years, who gender identified as men and were recruited through respondent driven sampling (RDS) in two independent cross-sectional studies: Momentum I (M1, February 2012-February 2014) and Momentum II (M2, February 2017-July 2019). Participants completed a computer-based survey and tests for HIV and other sexually transmitted infections. For GBM living with HIV, we measured HIV viral load (VL). We calculated RDS-II adjusted proportions and 95% confidence intervals for all variables for each time-period.

Results: We recruited 719 participants (119 seeds) in M1 and 753 participants (117 seeds) in M2. Among those who reported HIV negative/unknown serostatus, 66.1% (95% CI 60.0-72.2), reported testing for HIV in the previous year in M1 and 65.3% (95% CI 57.6-72.9) in M2. HIV prevalence was 25.8% (95% CI 21.1-30.6) in M1 and 20.4% (95% CI 14.5-26.3) in M2, with 0.4% (95% CI 0.0-0.9) previously undiagnosed in M1 and 0.1% (95% CI 0.0-0.2) in M2. Among GBM living with HIV, 83.9% (95% CI 76.3-91.5) were receiving ART and 82.3% were virologically suppressed (VL≤200 copies/mL) (95% CI 73.6-91.1) in M1 and 84.8% were receiving ART (95% CI 72.8-96.8) and 97.4% (94.6-100.0) were virologically suppressed in M2. Twelve participants in M1 and 11 in M2 reported not receiving ART but had VL <200 copies/mL.

Conclusion: Additional investments in the HIV response appear to have improved care cascade parameters for GBM in Vancouver, namely very low undiagnosed fraction and very high proportion of VL suppression. BC appears to have achieved 95-95-95 targets for this key population in Metro Vancouver.

133

Shifting Patterns of HIV-1 Spread in Quebec over the Last Two Decades

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Background: Phylogenetic analyses of the interrelationships of viral sequences from the provincial genotyping program has provided a molecular epidemiological framework to reconstruct HIV transmission networks in Quebec. We applied these methods to gain insights on HIV transmission patterns among Men having Sex with Men (MSM) and Heterosexual groups.

Methods: Phylogenetic analyses on HIV-1 polymerase sequences was performed using Maximum Likelihood methods and HIV-TRACE (Transmission Cluster Engine) platforms. Time trends in patterns of viral spread was assessed in three populations, including i) MSM (n=4800); ii) Heterosexuals with subtype B infections, including People who Inject Drugs (PWID) and recent migrants from the Americas (n=1836); and iii) Heterosexuals harboring non-B viral subtypes (n=1578). Epidemiological features implicated in clustering included region, sex, age, viral load, disease stage, recency of infection (based on % mixed base calls) and treatment status.

Results: Three patterns of viral spread occurred among MSM, including singleton transmissions (n=1404), small clusters (2-5 members) and large cluster networks (8-150 members). There has been a progressive decline in singleton transmissions and small cluster networks occurred over the 2007 to 2019 period. Large cluster outbreaks sustained the epidemic, rising from 18% to 65% of infections in MSM from 2002 to 2019. Overall, cluster size was inversely correlated with the recency of infection and age of subjects ($p<0.001$). The epidemic among PWID was largely historic (pre-2011). Large cluster outbreaks in Montreal and Quebec City was associated with the spread of transmitted resistance and non-B subtypes. Phylogenetics inferences revealed the introduction and crossover of subtype B and non-B subtype sub-epidemics related to recent migration and globalization.

Discussion: Phylogenetic inferences showed a decline in the epidemic among MSM. There remains a need to improve testing and prevention paradigms for younger individuals and recent migrants to avert large cluster transmission cascades and better control the HIV epidemic.

23

ChemStory: community produced podcasts to spark conversations about Chemsex and HIV Prevention

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Gay, bisexual and queer men (GBQM) are at high risk of HIV and other sexually transmitted and blood-born infections (STBBIs). A growing body of research links HIV/STBBIs risk behaviours within this population to sexualized substance use, a practice colloquially referred to as "chemsex" and “PNP”. While research in this area has predominantly focused on establishing the connections between substance use and sexual health-related outcomes, the literature focused on the perspectives of GBQM, including subjective rationales for chemsex, the meaning given to chemsex experiences, and GBQM’s thoughts about the best strategies to minimize the harm associated with chemsex, is limited. To address these knowledge gaps, we launched a community-based research initiative called Chemstory. Drawing on the principles of art-based research methods, Chemstory is a project centered around the production of podcasts by GBQM with a history of chemsex to share their perspectives and experiences. In collaboration with knowledge users, researchers, and an expert in podcasting, we designed a workshop series on podcasting that will be implemented in the winter of 2021 with a diverse group of 20 GBQM in Montreal (In French and English). The training includes three sessions covering the ethics of podcasting, storytelling, podcast production and podcast dissemination. The workshop series will prepare each participant to produce a 15-minutes podcast focusing on aspects of their experience they wish to share. The podcasts will then be analysed to build new knowledge about chemsex and HIV/STBBIs prevention grounded in the lived experience of GBQM with a history of chemsex. Finally, with the participants’ consent, we will disseminate the podcasts broadly to encourage and facilitate nuanced and compassionate conversations about chemsex and HIV/STBBIs prevention within the GBQM community as well as among health care professionals and policy makers.

147

Bias in Self-Collected Anal Specimens on Prevalence of Human Papillomavirus Infection in Gay, Bisexual and other Men who have Sex with Men (GBM) – A CIRN-funded Study

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Introduction: Human papillomavirus (HPV) prevention via vaccination is a priority for gay, bisexual and other men who have sex with men (GBM). Monitoring HPV prevalence can measure vaccine impact; however, estimates may vary depending on how specimen validity is defined. We estimated HPV prevalence among self-identified GBM and compared findings using different definitions of specimen validity.

Methods: Participants in the Engage Cohort Study aged 16 to 30 years self-collected anal specimens for HPV testing. We defined specimen validity as testing positive for (1) either HPV DNA using the Roche Linear Array or a human β-globin DNA cellular control, as is typical in HPV studies; or (2) human β-globin DNA regardless of HPV DNA positivity. We calculated prevalence for any HPV type, any vaccine-preventable types (HPV-6/11/16/18/31/33/45/52/58), and HPV-16. Estimates are pooled by city and weighted to account for respondent-driven sampling.

Results: Amongst 847 GBM (median age = 26 years, 5.9% HIV-positive), anal specimens from 645 (76.2%) were judged valid using definition 1 whereas 402 (47.5%) using definition 2. As expected, HPV prevalence was consistently lower when definition 2 was used. The magnitude of the absolute difference was greater when more HPV types were combined in an HPV outcome definition (Table 1).

Conclusions: Regardless of the validity definition used, anal HPV prevalence was high. In our study, due to the non-trivial proportion of β-globin-negative specimens, point prevalence estimates were markedly higher for definition 1 compared to definition 2. Thus, our estimates from definition 2 are likely closer to underlying population prevalence.

POSTER ABSTRACTS

AFFICHES

62

Anti-HIV activity of the modified human antimicrobial peptide 17BIPHE2

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Background: Unwanted pregnancies and sexually transmitted infections (STIs) are major health concerns of women worldwide. These concerns have prompted efforts to develop Multipurpose Prevention Technologies (MPTs), which simultaneously provide contraception and prevent STIs, including HIV. LL-37, the only human cathelicidin and an effective spermicide on human sperm, has broad antimicrobial activity including in vitro activity against HIV. 17BIPHE2 is a mimic of a truncated LL-37 peptide, engineered to contain 5 unnatural residues, thus limiting its protease degradation by vaginal fluid. Hence, this AMP represents a promising MPT agent. We, therefore, hypothesize that 17BIPHE2 will be a potent inhibitor of HIV infection.

Methods: PMA-stimulated ACH-2 cells, a chronically HIV-infected T cell line, were incubated with LL-37 or 17BIPHE2, and HIV replication was evaluated by p24 concentration in the supernatant via ELISA. Alternatively, HIV was incubated with 17BIPHE2 prior to infection of target cells. Infection was quantified by luciferase activity in an HIV reporter TZM-bl cell line or by p24 ELISA in activated CD4+ T cells.

Results: 17BIPHE2 inhibited HIV replication in stimulated ACH-2 cells in a dose dependent manner, while this was not observed with LL-37. Pre-incubation with 17BIPHE2 decreased the ability of HIV to infect TZM-bl cells in a dose-dependent manner across multiple titers of HIV. Preliminary results demonstrated that when HIV was incubated with 17BIPHE2 before infecting CD4+ T cells, HIV infection decreased with increasing amounts of 17BIPHE2.

Conclusion: Initial results show that 17BIPHE2 can reduce the ability of HIV to infect relevant target cells. The mechanisms of this activity and the specific stages of HIV replication where 17BIPHE2 exerts anti-HIV activity remain to be established. This project provides the groundwork to study 17BIPHE2 in other cells/tissues of the female reproductive tract and eventually in in vivo models of HIV infection.

96

Role of Membrane-associated Transporters in Modulating Fetal Drug Exposure: Relevance to Antiretroviral Drug Teratogenicity

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Despite the success of antiretroviral therapy implementation in pregnancy, fetal toxicity of antiretroviral drugs (ARVs) remains poorly understood, and existing literature often does not account for sex as a variable. Evidence of sex-linked neurotoxicity in ARV exposed children suggests sex-differential drug disposition, which may be explained by variable expression of membrane-associated ARV transporters of the placenta and fetal brain. This study evaluates the potential role of fetal drug transporters in modulating ARV penetration into the fetal brain.

Pregnant C57BL/6 mice were exposed to a clinically-relevant daily treatment of oral lamivudine + abacavir + atazanavir/ritonavir, or to a vehicle control. Tissues were collected on gestational day 18.5 and relative mRNA and protein expression of a panel of key ARV drug transporters was analyzed by qPCR and immunoblotting assays of fetal brain and placenta (n = 57 fetuses). In placenta, ARV exposure was associated with lower expression of Abcc1 (multi-drug resistance-associated protein 1) and Slc29a1 (Equilibrative nucleoside transporter 1). Additionally, greater expression of Abcc1 and Slc29a1 was observed in the placentae of female compared to male fetuses ($p < 0.05$). Sex and treatment were not significantly associated with transporter expression in fetal brain. ARV penetration into maternal plasma, amniotic fluid and fetal brain was also quantified by LC-MS/MS (n = 56 fetuses). All four drugs were detected in amniotic fluid, while only abacavir and lamivudine were detected in the fetal brain at 12.6 ± 7.0 ng/mg and 434.6 ±125.5 ng/mg respectively.

This study provides novel evidence of sex-differential ARV transporter expression in the placenta, as well as characterization of ARV penetration into fetal brain and amniotic fluid. Due to the critical role that drug transporters play in modulating ARV exposure in the developing brain, these novel data contribute to a broader understanding of the influence of age and sex on antiretroviral drug neurotoxicity.

101

Identifying Safe and Effective Type 3 RNA Polymerase III-Promoted shRNAs on Lentiviral Vectors for Use Against HIV

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Background: While antiretroviral drugs effectively prevent human immunodeficiency virus (HIV) infection from progressing into serious disease, they are unable to eliminate the virus from the body. It may be possible to functionally cure HIV infection by modifying autologous hematopoietic stem cells ex vivo and retransplanting them into the patient. One modification strategy uses antiviral short hairpin (sh)RNAs which can be designed to target conserved HIV genomic sequences for degradation. Several anti-HIV-1 shRNAs have been identified that can be transduced into patient cells to make them resistant to HIV-1 replication. The choice of promoter from which shRNAs can be expressed can influence transcriptional efficiency, in turn impacting shRNA potency and potentially cytotoxicity. We aim to identify non-toxic combinations of shRNAs and promoters that will effectively inhibit HIV-1 replication.

Methods: We transduced cells with lentiviral vectors containing top shRNAs identified from three different screens. The best shRNAs were systematically expressed from one of the three human type 3 RNA Polymerase III promoters: 7SK, U6, and H1. Constructs were assessed for their ability to inhibit HIV replication using a reverse transcriptase assay and for their cytotoxicity with a competitive cell growth assay.

Results: Our data suggest that U6- and 7SK-promoted shRNAs delay viral replication. While some of these constructs also showed cytotoxicity, not all U6- and 7SK-promoted shRNAs demonstrated a negative impact. These findings suggest that the efficacy and toxicity of a shRNA depends on the promoter and on the shRNA sequence.

Conclusion: Our results give information on the best RNA-based molecules with the highest potential for clinical use and provide insights into the use of different RNA polymerase III promoters for shRNA gene therapy.

142

Generation and Characterization of an in vitro Organotypic Foreskin Model to Study HIV-1 Susceptibility

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Background: The foreskin is a primary site of HIV-1 acquisition in heterosexual males; however, a lack of relevant in vitro models that recapitulate important epithelial barrier functions has limited our understanding of susceptibility at this site. We hypothesized an organotypic in vitro foreskin model would better mimic the foreskin tissue compared to current models.

Methods: Organotypic foreskins were generated from primary foreskin fibroblasts and keratinocytes isolated from adult men undergoing elective circumcision, and matured at the air-liquid interface over 5 weeks. Organotypic foreskins were compared to explanted foreskin tissue maintained in culture for seven days (explants) and tissues cryopreserved immediately after surgery (representative of the in vivo state we hope to recapitulate). Organotypic cultures, explants, and cryopreserved foreskin tissue were assessed for tissue architecture by immunofluorescent microscopy and for epithelial permeability using a fluorescent tracer dye applied for 6-24 hours (dextran).

Results: Organotypic foreskins displayed a stratified, keratinized epithelium with localization of keratin (Filaggrin) to terminally differentiated keratinocytes on the apical aspect and robust expression of cell junction proteins (E-cadherin) (Figure 1). Organotypic foreskins successfully excluded the tracer dye while explants did not.

Impact: Organotypic in vitro foreskins mimic in vivo tissue structure and epithelial barrier function while conventional explants do not. Development of this model will facilitate discerning the mechanism(s) by which circumcision reduces HIV-1 susceptibility, while permitting future testing of microbicides on the penile microbiome to examine its relation to susceptibility.

157

HIV exposure in utero affects DNA methylation at birth in South African infants

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Human Immunodeficiency Virus (HIV) infection rates remain a global public health concern, and while the use of antiretroviral therapy (ART) has reduced perinatal mother to child transmission rates, there is a growing proportion of infants exposed to HIV in utero. In 2013, an estimated 22% of uninfected infants were born to HIV positive mothers in South Africa. HIV exposure during pregnancy has been linked to neurodevelopmental delay, increased infant mortality, and impaired immune response.

DNA methylation is an epigenetic regulator of gene expression, which changes over the course of a lifetime in response to environmental stimuli. This exploratory study aimed to determine whether HIV exposure during pregnancy could alter DNA methylation patterns of the infant. Umbilical cord blood was collected at birth from children enrolled in the Drakenstein Child Health Study, and DNA methylation was assessed using the Illumina 450K and EPIC arrays. An ANCOVA model accounting for natural killer cells, nucleated red blood cells, CD8 T cells, race, and child sex was run using RStudio. This analysis indicated that several differentially methylated sites between HIV-exposed uninfected (HEU) and HIV-unexposed uninfected infants. A similar model was used to assess DNA methylation of HEU infants whose mothers were on either two NRTIs + NNRTI, a single NRTI, or two NRTIs + PI, and identified differentially methylated loci which were not represented in the first analysis were identified, suggesting that HIV exposure and type of ART provide distinct methylation stimuli in the developing foetus.

234

High Study Levels of Accuracy, Usability, and Acceptance by Observed Participants Lead to Health Canada Licensing Canada's First HIV Self-Test

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Introduction: Having a licensed HIV self-test in Canada provides new opportunities to increase the access, uptake and frequency of HIV testing and more effectively reach the undiagnosed especially in priority populations. The objectives of this study were to (1) evaluate the INSTI HIV Self-Test (HIV-ST) performance compared with laboratory reference testing, (2) document if intended users can perform the steps to use the HIV-ST device, and (3) document if intended users can successfully interpret contrived positive, negative, and invalid results. Study was submitted to Health Canada for review for license purposes.

Methods: The study used a cross-sectional design and recruited consenting adults from four community sites across Ontario, Québec, and Manitoba between August 2019 and March 2020. The results of the observed HIV-ST were compared with results of the Abbott Architect HIV Ag/Ab Combo test.

Results: Primary efficacy analysis on 678 completed HIV-ST revealed a positive percent agreement of 100% and a negative percent agreement of 99.5% with the comparator method. A total of 6 previously undiagnosed participants were identified through study testing and linked to care and treatment. Of the 708 participants who took part in the usability study, 92.4% successfully performed the steps determined to be "critical" for successful completion of the test, 96.7% found the instructions easy to follow, and 95% indicated that they would use the test again. Of the 404 participants who interpreted the strong positive, weak positive, negative and invalid contrived results, successful interpretation ranged from 90.6% (for weak positive) to 99.3% (for negative).

Conclusions: This study showed high levels of accuracy, usability and acceptance by participants, leading to license by Health Canada of the INSTI HIV Self-Test in November 2020. A REACH 3.0 national implementation science project will provide 60,000 free HIV-ST to participants across Canada starting in February 2021.

65

Premature Cardiovascular Disease Development In HIV-1 Infected Individuals From The Canadian HIV And Aging Cohort Study Is Associated With Discrepancies In BAFF And APRIL Levels

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B-cell Activation Factor (BAFF) is a survival and differentiation factor involved in shaping the Marginal Zone (MZ) B-cell pool. We have shown that BAFF levels are augmented in HIV-1 infected progressors, as soon as the acute phase and up to 12 months post therapy. Excess BAFF is concomitant with chronic inflammation, autoimmunity manifestations and B-cell disorders, such as hyperglobulinemia and deregulation of MZ populations, shown to possess a Breg potential.
Excess BAFF has been linked to several chronic inflammatory conditions such as cardiovascular diseases (CVD) like atherosclerosis. Excess BAFF promotes endothelial dysfunction, a risk factor for atherosclerosis, and can be produced by adipocytes, creating a link between obesity and inflammation.

Long term HIV-1 infected individuals appear to develop premature comorbidities normally associated with aging, such as CVD and atherosclerosis. Our hypothesis is that excess BAFF and B-cell deregulations are involved in the premature development of CVD in long term HIV-1 infected individuals from the Canadian HIV and Aging Cohort Study (CHACS). To this end, we have found that HIV+ individuals possess higher levels of BAFF than HIV- individuals even after several years of ART therapy, with membrane BAFF levels being greater in CVD+ individuals. In HIV- individuals, BAFF levels correlate positively with Total Plaque Volume (TPV). Interestingly, levels of A Proliferation-Inducing Ligand (APRIL), an analog of BAFF, were lower in CVD+ individuals. Surprisingly, in HIV+ individuals, APRIL correlates negatively with TVP and with BAFF levels. This data suggests an unexpected atheroprotective role for APRIL. These results suggest that discrepancies in BAFF/APRIL levels could be associated with premature CVD development in long term HIV-1 infected individuals. Interestingly, MZ B-cells are involved in the immunosurveillance of atherosclerosis and palliate against its development in a mice model. BAFF-mediated deregulation of these populations could also contribute to CVD development in HIV+ individuals.

56

Selection of Safe and Effective Antiviral RNAs for an HIV-1 Functional Cure

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Background: The only confirmed cases of an HIV-1 cure have been two individuals who received hematopoietic stem cell transplants (HSCT) from donors with natural resistance to HIV-1. To translate this into a treatment option for HIV infection, several clinical trials have been initiated to insert antiviral genes into an infected person's cells during an autologous HSCT. Combinations of safe and effective genes need to be used so that HIV-1 replication is completely inhibited, and no resistant virus emerges. Although several antiviral genes have been identified, there are limited data on how they compare to one another both within and between classes.

Methods: Genes expressing anti-HIV-1 ribozymes, aptamer/decoy RNAs, short hairpin (sh) RNAs and U1 interference (U1i) RNAs were directly compared for efficacy and safety in HEK293T and SupT1 cells. Potent shRNA candidates were also compared when expressed from different promoters (U6, 7SK and H1).

Results: shRNAs and U1i RNAs were much more effective at inhibiting HIV-1 replication compared to other RNA classes. For U1i RNAs, those that enhance HIV-1 RNA splicing were more effective compared to those that inhibit polyadenylation. For the most effective U1i RNA, we were able to increase its specificity by lengthening its recognition domain. For shRNAs, the 7SK and U6 promoters resulted in higher levels and potency compared to the H1 promoter, but their use resulted in cell growth defects. These defects could be mitigated in some cases by altering the shRNA loop.

Conclusions: So far, data from clinical trials has shown that HSCT with antiviral genes is safe but that better antiviral genes are needed. By directly comparing some of the top candidates from the literature we have identified the genes that will have the greatest chance of success in curing HIV infection in the clinic and we have started evaluating different gene combinations.

67

Development of LAG3+ cell lines and their use for studying the LAG3 mechanism

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Background: Immune checkpoints are negative coreceptors that regulate immunity and are expressed during HIV and other cases of chronic activation. The immune checkpoint LAG3 is elevated on HIV-infected cells and being targeted by several dozen clinical trials for cancer treatment. Despite its promise, LAG3 is relatively understudied, with its mechanism remaining unknown.

Approach: We have developed Jurkat cell lines expressing wild-type LAG3 and non-functional LAG3 lacking the cytoplasmic domain (CY) to study its mechanism and potential role in HIV-infection.

Results: Upon activation with Staphylococcal enterotoxin E or D (SEE or SED) LAG3-negative or CY cell lines produce significantly more IL-2 than the cell lines expressing wild-type LAG3. Furthermore, activation of kinases involved in the TCR signaling pathway, including ERK (T202/T204), are also impaired in cells expressing wild-type LAG3 as compared with LAG3-negative cells.

Conclusion: Our developed LAG3-expressing cell lines behave as expected. These cells can be used for further experiments characterizing the LAG3 mechanism and role in HIV-infection.

Relevance: Blocking LAG3 has the potential to enhance anti-HIV immunity while helping to activate HIV transcription, thus potentially augmenting both the kick and kill aspects of a functional HIV cure.

72

The effect of interferon-alpha subtypes on HIV-1 associated CD8+ T cell hyperactivation and dysfunction

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Different interferon-alpha (IFN-α) subtypes have been shown to elicit distinct control of different viral infections. Along with its direct antiviral effects, IFN-α also strongly modulates host innate and adaptive immune responses. Our previous work showed that IFN-α subtypes differentially control HIV-1 infection and mediate distinct effects on immune function. Clinical use of the IFN-α2 subtype has not been highly effective in reducing viral or proviral HIV-1 and high levels of endogenous IFN-α2 has been associated with CD8+ T cell hyperactivation and dysfunction in HIV-1 patients. Our prior study with the IFN-α14 subtype suggested that some IFN-α subtypes may be beneficial in HIV-1 infection. Using HIV-1-infected TKO-BLT humanized mice, we demonstrated that after 3 weeks of treatment IFN-α14 significantly reduced markers of CD8+ T cell-related dysfunction such as hyperactivation, exhaustion and apoptosis and, unlike ART, these low levels were maintained even after the treatment was withdrawn. IFN-α14 treated mice also maintained a more naïve CD8+ T cell profile as opposed to the development of the larger effector memory subset observed in HIV-1 infected and IFN-α2 treated mice. Although IFN-α14 reduced the activation profile and proliferative capacity of CD8+T cells, it did not change their ability to secrete cytokines or degranulate upon stimulation ex vivo. Also, IFN-α14 treatment did not reduce the CD4+ T cell count supporting the hypothesis that IFN-α14 treatment does not exacerbate disease progression and may have therapeutic potential to alleviate CD8+ T cell dysfunction during HIV-1 infection.

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30

GDF15 as a biomarker of HIV reservoir size in ART-treated PLWH

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Background: Growth differentiation factor-15 (GDF15) is a transforming growth factor-β family member. Cellular stress leads to mitochondrial response releasing mitochondrial cytokines including GDF15, which in turn influence the whole-body energy homeostasis and inflammaging. In cardiovascular diseases, cancer and COVID19, elevated plasma GDF15 levels correlate with tissue stress response and are used as a biomarker for clinical outcome. Herein, we assessed whether plasma GDF15 levels were associated with clinical characteristics, inflammation and HIV reservoir size in people living with HIV (PLWH) taking antiretroviral therapy (ART).

Method: Blood was obtained from 55 ART-treated PLWH and 50 uninfected controls. GDF15, inflammation (IL1β, IL6, IL8, TNFα, IP10, CXCL13, sCD14), senescence (soluble urokinase plasminogen activator receptor [suPAR]) and gut permeability (LPS, REG3α and IFABP) markers were quantified in plasma by ELISA. HIV integrated DNA was quantified by nested-qPCR in sorted CD4 T-cells.

Results: PLWH were treated for a median of 14 years (viremia below 50 copies/mL), with a median age of 54 years. Plasma GDF15 levels were higher in PLWH than uninfected controls ($p<0.01$) and correlated with age and duration of infection. Type or class of ART had no influence on GDF15 levels in multivariate analyses. GDF15 levels were not associated with weight, BMI, inflammation, nor gut permeability markers. Conversely to other markers, GDF15 levels were strongly associated with integrated HIV DNA levels ($r=0.59$, $p<0.01$) independently of age, sex, and CD4 count. GDF15 levels were also associated with suPAR levels. In vitro stimulation of PBMC with inflammatory stimuli (LPS and/or PMA-Ionomycin) did not induce GDF15 expression.

Conclusion: In ART-treated PLWH, GDF15 levels were associated with suPAR, a marker of non-AIDS comorbidities, independently of other inflammatory and gut permeability markers. GDF-15 was also independently associated with HIV reservoir size. Further investigations are required to assess the role of GDF15 in HIV persistence and non-AIDS comorbidities.

50

Dendritic cells and IL-7 synergize to expand latent CD4+ T cell populations

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Antiretroviral therapy (ART) suppresses HIV infection to undetectable levels. However, upon withdrawal of ART, viremia rebounds rapidly to pre-treatment levels, indicating the presence of latently-infected cells during ART. Understanding the mechanisms that induce/maintain latent cells is critical to achieving HIV cure. Naïve and memory CD4+ T cells recirculate through secondary lymphoid organs, where they continuously contact dendritic cells and are exposed to the homeostatic cytokine IL-7. Signals generated from the T-cell receptor and IL-7R induce homeostatic proliferation and maintain memory T cell survival at steady-state. In this study, we tested our hypothesis that similar mechanisms maintain latent T cells under ART. To address this, we generated a full-length, R5-tropic dual-fluorescent HIV reporter that encodes two fluorescent markers: a Nef-E2Crimson fusion protein under the control of the HIV LTR, and the EF1a-HTLV1 fusion promoter driving the expression of ZsGreen1 (HIVNef-CRMZY). Infection of primary CD4+ T cells with this reporter allowed us to visually identify productively-infected (E2Crimson+ZsGreen1+) and latently-infected (E2Crimson-ZsGreen1+) cells. Functional Nef expression was confirmed by significant CD4 downregulation in productively-infected cells. Using both intracellular p24 staining and cell surface CD4 receptor expression as a sensitive marker for viral protein production, we further define a truly latent T cell population as E2Crimson-ZsGreen1+CD4high p24neg, which we followed longitudinally for up to 15 days in culture. We show that while IL-7 alone increased the proportion of latently-infected T cell population in vitro, co-culture with syngeneic monocyte-derived dendritic cells greatly expanded latent T cell populations. Our data demonstrate that latently-infected T cells may exploit/utilize physiological signals within lymphoid tissues to achieve long-term survival.

Significance and Conclusion: Investigations into the signals (tonic or antigen-derived) that help maintain the HIV reservoir in memory T cells may uncover a possible immunological approach to reducing the size of the HIV reservoir.

64

Within-host HIV evolutionary and proviral decay dynamics in former viremic controllers

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Viremic controllers are underrepresented in HIV reservoir dynamics studies. We combined single-genome sequencing (SGS), proviral quantification, phylogenetics and mathematical modeling to: 1) reconstruct within-host pre-ART HIV evolutionary histories, 2) measure proviral burden, age and diversity on-ART, and 3) estimate proviral half-lives, in 4 viremic controllers.

Three participants broadly maintained pVL <~2000, while one eventually lost control before initiating ART. We performed HIV nef RNA SGS on a median of 12 longitudinal pre-ART plasma samples/participant and HIV nef DNA SGS on proviruses sampled a median 1.9 years following ART. Reservoir size on-ART was estimated using the Intact Proviral DNA Assay. Proviral sequence ages were inferred using a phylogenetic approach that leverages within-host pre-ART HIV evolutionary rates. We then applied a published mathematical model of reservoir dynamics to infer host-specific proviral half-lives.

We collected 356 unique plasma HIV RNA sequences (range 52-173/participant) and 206 intact unique proviral sequences (12-118/participant). All within-host phylogenies exhibited molecular clock signal pre-ART (range 1.16×10-5–5.35×10-5 substitutions/base/day). Pre-ART pVL areas under the curve correlated strongly with longitudinal pre-ART plasma HIV sequence diversity, total on-ART proviral burden and overall on-ART proviral diversity (all Spearman's ρ=1; p=0.08). Intact proviral percentage ranged from 10-94%, where the latter was observed in the individual who lost control prior to ART. For two participants, inferred proviral integration dates ranged from shortly following infection to cART initiation. For the other two, including the participant who lost control, proviruses dated well into chronic infection. For three of four participants, the best-fit proviral half-life estimates were <~1 year, suggesting rapid proviral turnover pre-ART. The fourth participant's proviral pool was consistent with negligible decay following deposition.

Despite viremic control, significant within-host pre-ART HIV evolution nevertheless gave rise to diverse within-host proviral pools with varying intact genome burden. HIV eradication strategies must overcome within- and between-host proviral diversity.

99

Investigating the role of miRNAs during HIV-1 Infection of CD4+ T lymphocytes

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MicroRNAs are small, non-coding RNAs that modulate gene expression. We set out to study the contribution of miRNAs in modulating HIV-1 infection of CD4+ T lymphocytes. To this end, using next generation RNAseq, we evaluated the expression profile of miRNAs and mRNAs in productively infected, virus-exposed bystander and uninfected lymphocytes. Data from our bioinformatics analyses of differentially expressed miRNAs and their potential mRNA targets reveal a remodeling of several key host pathways that are likely to modulate infection and pathogenesis. Concurrently, we focused our attention on miRNAs-103/107 that were recently shown to function as modulators of CCR5 in macrophages, and investigated their roles in lymphocytes. CD4+ EMT (effector-to-memory transitioning) T cells are a subpopulation of lymphocytes in which the potential for HIV-1 infection is briefly increased due to a transient elevation in CCR5 expression, a condition that promotes latent infection as EMT cells have a reduced ability to transcribe integrated proviral DNA. Our results suggest that miRNAs-103/107 have a role in this transient modulation of CCR5 expression as the progressive decrease in CCR5 coincides with an increase in miRNAs-103/107. In addition, nucleofection of miRNAs-103/107 mimics in CD4+ T cells decreased the level of CCR5 surface expression, while nucleofection of miRNA-103 antagomirs attenuated its decrease. Subsequently, using a double reporter virus (HIV-CRMZ), which allows for flow cytometry-based identification of productively and latently infected cells, we confirmed that CD4+ EMT T cells are more susceptible to latent infection. Experiments aimed at determining the impact of treatment with these miRNAs on the frequency of latent cells are currently underway. Given that the latent reservoir is the main obstacle to the eradication of HIV-1, these data bring new perspectives to counter the establishment of HIV-1 reservoirs.

125

Antiretroviral Drug Efflux Transporters and Metabolic Enzymes in Circulating Monocytes and Monocyte-Derived Macrophages of ART Treated People Living with HIV

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Background: Drug efflux transporters and metabolic enzymes govern drug disposition and could render antiretroviral drug (ARV) intracellular concentrations suboptimal, thus facilitating HIV infection and HIV reservoir persistence in target cells, such as myeloid cells. In this study, we investigated the expression of these transporters and metabolic enzymes in monocyte subsets and monocyte-derived macrophages (MDMs) of people living with HIV (PLWH) receiving viral suppressive antiretroviral therapy (HIV+ART) and HIV-uninfected individuals (HIV-). Plasma and intracellular ARV concentrations were quantified in HIV+ART cells.

Methods: Classical, intermediate, and non-classical monocytes were identified based on their distinct CD14/CD16 expression. Total monocytes were isolated from peripheral blood mononuclear cells (PBMCs) by negative selection using magnetic beads and differentiated into MDMs by six days culture in the presence of macrophage colony-stimulating factor. mRNA and protein expression of drug transporters and metabolic enzymes were analyzed by qPCR and flow cytometry, respectively. Plasma and intracellular (PBMCs, monocytes, MDM) ARV concentrations were quantified by LC-MS/MS analysis.

Results: The mRNA and/or protein expression of relevant ARV transporters (ABCB1/P-gp, ABCG2/BCRP, ABCC1/MRP1, ABCC4/MRP4, SLC22A1/OCT1, and SLC29A2/ENT2) or metabolic enzymes (CYP2B6, CYP2D6, and UGT1A1), was detected in monocytes and matched MDMs. BCRP and MRP1 protein expression was higher in intermediate compared to classical monocytes of both HIV+ART and HIV- individuals. We obtained novel ARV intracellular concentration data in monocytes of PLWH, whereas concentrations in MDM were mostly undetectable. Plasma ARV concentrations were within previously reported therapeutic ranges.

Conclusion: Herein, we demonstrated the highest frequencies of ARV efflux transporters on intermediate monocytes, a subset expanded during HIV infection, expressing the highest levels of the HIV coreceptor CCR5. These transporters could potentially limit ARV intracellular concentrations and contribute to persistent HIV infection of these cells. These novel findings prompt future investigations on HIV reservoir persistence in tissue-resident myeloid cells in relationship with specific ART regimens.

127

Involvement of the mTOR Signaling Pathway in the Regulation of Antiretroviral Drug Efflux Transporters in CD4+ T-cells Exposed to an HIV Pseudotype

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Background: We previously demonstrated that ATP-binding cassette (ABC) drug efflux transporters could contribute to low ARV intracellular concentrations in HIV-1 target tissues and cells. Furthermore, studies have reported that these transporters could be induced in activated and/or HIV-infected T-cells. The mammalian target of rapamycin (mTOR) signaling pathway is activated following HIV infection and T-cell activation. Therefore, we examined the regulation of ABC drug efflux transporters by mTOR, and their potential contribution to the inflammatory response following HIV-induced T-cell activation.

Methods: Human peripheral blood mononuclear cells (PBMCs) were exposed to HIV-1 envelope glycoprotein gp120IIIB, HIV pseudotype (pHIVNL4-3) and/or mTOR inhibitors. The expression of ABC transporters, T-cell activation marker CD69, mTOR and GFP+ pHIVNL4-3 was assessed in CD4+ T-cells by Flow cytometry. Proinflammatory cytokines (IL6, TNFα and INFγ) mRNA and protein levels were examined following exposure to pHIVNL4-3 and/or inhibitors of mTOR and ABC transporters by qPCR and ELISA analyses, respectively.

Results: Protein expression of ABC transporters (P-glycoprotein (P-gp), breast cancer resistance protein and multi-drug resistance associated protein-1 (MRP1)) was significantly increased in CD4+ T-cells exposed to gp120IIIB or pHIVNL4-3. Treatment with the selective mTOR pan-inhibitor OSI-027 reversed pHIVNL4-3-induced expression of these transporters in CD4+ T-cells. Inhibition of P-gp by verapamil or PSC833, or MRP1 by MK571, decreased concentrations of TNFα, INFγ and IL-6 in supernatants of PBMC exposed to pHIVNL4-3.

Conclusion: To the best of our knowledge, we present novel data demonstrating that ABC drug efflux transporters are upregulated via mTOR signaling in CD4+ T-cells exposed to pHIVNL4-3. These transporters could limit ARV permeability in HIV target T-cells. Furthermore, these transporters could potentially contribute, in part, to HIV-associated proinflammatory cytokine secretion. This study provides a basis to further assess the role and regulation of ARV drug efflux transporters in T-cell activation and inflammatory response, in the context of HIV infection.

211

Rab7+ Vesicles are Involved in HIV-1 Gag Repositioning to Virus-Containing Compartments (VCC) in Macrophages.

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HIV-1 infection can be managed with antiretroviral therapies (ART), but these fail to eliminate the virus due to the establishment of latent infection in several cell types. Infected macrophages sustain viral replication and act as viral reservoirs even during ART (PMID: 28414330; 28811349). HIV-1 accumulates/buds into cytoplasmic virus-containing compartments (VCC) in macrophages, where it evades humoral immune responses (PMID: 22205742). HIV-1 assembly begins with the viral protein Gag translocation to the assembly site. Gag co-traffics with Late endosomes/Lysosomes (LEL), in HeLa cells, and repositioning of LEL to the cell periphery increased virus release (PMID: 17004321, 19286658). HIV-1 also maintains Gag/LEL peripheral positioning under various stress conditions (PMID: 28710431). Further studies demonstrated that the downregulation of LEL-related host proteins supresses HIV-1 release, suggesting that LELs direct Gag to membrane assembly sites (PMID: 22072966; 19451649). LEL proteins can be found in VCCs, so we propose LEL are essential for HIV-1 assembly at VCCs in macrophages (PMID: 12885763; 16087369). To answer this question, immunofluorescence was used to examine whether VCCs formed in the macrophage cell line THP-1 GagZip, following induction of HIV-1. We observed that Gag co-localized with the VCCs markers CD81 and CD9. ELISA assays demonstrated that VCCs formation correlated with decreased virus release, suggesting that HIV-1 accumulates within VCC-like structures in THP-1 GagZip macrophages. We studied LEL involvement in VCC phenomena using Rab7 as a marker, and observed that Rab7 colocalized with Gag within VCC-like structures, suggesting that HIV-1 repositions Rab7+ LEL to macrophage VCCs. Further investigation into the roles for VCCs aim to understand how to target VCCs for immune-mediated viral clearance and the design of new approaches to eradicate HIV-1.

221

Investigating the role of HIV-1 Nef-mediated exosome modulation during viral reactivation from latency

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A better understanding of factors that contribute to HIV latency and reactivation is needed to improve clinical strategies to eliminate viral reservoirs. HIV Nef promotes the formation of exosomes that contribute to autocrine and paracrine cell signaling. Exosomes containing Nef and cellular ADAM17 can trigger CD4 T cell activation, leading to secretion of TNF-α and HIV reactivation in cell culture; however, Nef's role in modulating latency remains understudied.

To examine whether exosomes produced by naturally arising Nef alleles differ in their ability to mediate viral reactivation from latency, we treated a latent HIV-infected human CEM T cell clone harbouring a single integrated provirus lacking Nef (C-Lat-Nef-KO) with exosomes produced using wild-type Nef (SF2), a mutant Nef (AXXA) that is unable to activate ADAM17, and two Nef isolates representing major pandemic HIV subtypes B and C. HIV reactivation (Gag-p24 expression) was quantified by flow cytometry.

Consistent with prior reports, we observed significantly higher viral reactivation (~ 5 fold) in cells treated with exosomes produced using wild type Nef compared to those treated with exosomes produced using mutant Nef. Interestingly, the natural Nef isolates differed in their abilities to mediate viral reactivation from latency ($p<0.001$), with the subtype B clone exhibiting higher activity (~2 fold higher Gag24 expressing cells) compared to the subtype C clone.

Our results indicate that Nef's ability to mediate viral reactivation from latency may differ among natural arising Nef alleles. A larger, more diverse panel of Nef clones will be examined to validate our observations and possibly illuminate Nef polymorphisms that are crucial for this function. This work highlights the role of Nef in modulating viral reactivation from latency, which might lead to novel approaches to enhance HIV eradication strategies.

35

Characterization of tissue resident myeloid cells in the liver and lung of SIV-infected rhesus macaques.

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Viral dissemination occurs early after infection targeting CD4 T cells and monocytes/macrophages. Monocytes derived from bone marrow and tissue resident macrophages (TRMs) derived from yolk sac, are short-lived and long-lived cells, respectively. HIV infects non-lymphoid tissues, such as liver and lung in which TRMs may represent viral reservoirs (VRs). Whereas we demonstrated that early antiretroviral therapy (ART) efficiently prevents infection of monocytes in the blood, spleen and intestine of SIV-treated rhesus macaques (RMs), little is known so far about the role of TRMs, and whether these cells may represent VRs in SIV-infected RMs.

Cells from liver and lung were isolated from RMs infected with SIVmac251. The phenotype of TRMs was analyzed by flow cytometry using specific antibodies including anti-CD14, anti-CD16, as well markers of TRMs such as CD44, CD59, CD35, CD117, CD206, MERKT, and LYVE. The levels of viral DNA and RNA were quantified by qPCR. `

Our results revealed that myeloid cells from the lungs and livers of SIV-infected RMs expressed mostly CD117, CD206 and LYVE markers. By performing a mechanical procedure, instead to use a cocktail of proteases, we preserved CD14 shedding that allowed to identify infiltrate cells. Thus, we also detected infiltrate monocytes (CD14+) that do express TRM markers in the infected tissues. Concomitantly, our data revealed that liver and lung of SIV-infected RMs both contain viral RNA and DNA.

To date we are assessing, which TRM subsets express viral DNA and RNA, and whether early ART prevents the infection of TRM in SIV-infected RMs. Understanding the nature of infected cells under ART is of crucial importance for developing strategies aim to eradicate HIV.

110

Persistence of HIV and SIV in the Brain Despite Effective ART

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Background: Despite antiretroviral therapy (ART), HIV continues to persist in anatomical and cellular sanctuaries. HIV infects the brain and replicates in microglia and trafficking macrophages. We previously demonstrated the limited impact of ART on persistence of virus in brains of patients with undetectable plasma viral load. This study investigates the efficacy of ART in brain using primary human microglial cultures and brain tissues from SIV-infected nonhuman primates and an expanded cohort of HIV-infected humans in the absence or presence of ART.

Methods: To determine the EC50 levels of antiretroviral drugs, HIV-infected microglia and lymphocytes were treated with dolutegravir, ritonavir, emtricitabine, raltegravir, and tenofovir. Total DNA and RNA were extracted from post-mortem brains of SIV-infected Rhesus macaques (n=19) and HIV-infected patients (n=15) receiving ART and quantified by ddPCR.

Results: All ART drugs displayed lower EC50 values in lymphocytes than in microglia except tenofovir, which showed two-fold greater activity. SIV RNA, total and integrated DNA was detected in brain regions among animals receiving suppressive, interrupted and no ART comprised of the same drugs examined in the in vitro studies. Similarly, HIV RNA, total and integrated DNA were detected in brain tissues of all HIV-infected patients regardless of ART duration and plasma viral load. Analysis of host antiviral immune responses showed these genes were increased in the brains of all HIV-infected persons compared to uninfected control brains. Moreover, SIV and HIV antigens were detected in brain, largely in microglia/macrophage cells regardless of treatment regimen. This might be in part due to higher expression of efflux genes in microglia compared to lymphocytes.

Conclusions: Contemporary ART is relatively less effective in HIV-infected microglia, which might contribute to HIV persistence in the brain that is seemingly independent of blood viral load. New pharmacological approaches are required to enhance ART efficacy in the brain.

209

Establishing Humanized Mouse Models for HIV and HIV/TB Co-Infection

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Currently, there are 38 million people living with human immunodeficiency virus (HIV-1) worldwide and there were 690,000 acquired immunodeficiency syndrome (AIDS)-related deaths in 2019 alone. The greatest cause of mortality in people living with HIV is infection with opportunistic pathogens such as tuberculosis (TB), which accounts for one third of AIDS-related deaths. In fact, HIV-positive individuals are 20 times more susceptible to TB infection. HIV and TB co-infection leads to significantly worsened outcomes in terms of both diseases. Humanized mouse (hu-mouse) models, which possess human immune cells for HIV to infect, have proven to be useful for HIV research. Our aim is to create hu-mouse models of HIV and HIV/TB co-infection to investigate disease progression, immune responses, therapeutics, prevention and vaccination. NOD-Rag1null-IL2rgnull (NRG) mice are highly immunocompromised mice that are traditionally used to generate hu-mouse models. We are also developing NRG mice that are transgenic for human HLA-DR4 and HLA-A2 (DRAG-A2). Previous studies reveal that humanized DRAG-A2 mice develop significantly higher T cell reconstitution compared to NRG mice and are able to undergo immunoglobulin isotype-switching to produce human antibodies such as IgG. NRG and DRAG-A2 mice were humanized with hematopoietic stem cells obtained from human umbilical cord blood. 52% of NRG mice were successfully reconstituted with human T cells, B cells and monocytes to greater than 10% of total circulating leukocytes, whereas 100% of DRAG-A2 mice were successfully engrafted, as determined by flow cytometry. In a proof-of-concept experiment, female humanized NRG mice were infected intravaginally with NL4.3-Bal-HIV-1 and assessed for HIV load via vaginal wash and blood plasma qRT-PCR. Humanized NRG mice were also successfully infected intranasally with TB as demonstrated by flow cytometry and histology. Preliminary DRAG-A2 experiments are ongoing. In future experiments, hu-mice will be co-infected with HIV and TB to enable us to investigate co-infection.

239

Dynamics and epigenetic status of regulatory T-cells following antiretroviral therapy (ART) initiation in early HIV infection

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Background: HIV infection leads to the expansion of immunosuppressive regulatory T-cells (Tregs), contributing to immune dysfunction, mucosal fibrosis, and disease progression. Antiretroviral treatment (ART) upon HIV exposure improves CD4 count and decreases immune activation and reservoir size. However, the dynamics of Tregs following early ART initiation remain understudied.

Methods: Peripheral blood mononuclear cells (PBMCs) were collected from 123 individuals consisting of HIV-infected untreated in acute and chronic phases, ART-treated in early infection (median of ART initiation: 6.7 months post-infection), elite controllers (EC), immunological controllers (IC), and HIV-uninfected controls. Tregs subsets were characterized by multiparameter flow cytometry. The methylation status of six regulatory regions of the foxp3 gene was assessed using MiSeq sequencing technology.

Results: HIV infection decreased the CD4/CD8 ratio and increased T-cell activation (CD38+HLA-DR+) and immunosenescence (CD28-CD57+) phenotypes, which were all improved after early ART initiation. Total Treg frequency increased over time during HIV infection, which was normalized in early ART recipients. Tregs in untreated individuals expressed higher levels of activation and immunosuppressive markers (CTLA4, CD39 and LAP(TGF-β1)), which remained unchanged following early ART. Expression of gut migration markers (CCR6, CCR9, Integrin-β7) by Tregs was elevated during HIV infection and suppressed after ART initiation. Importantly, gut-homing Tregs expressing LAP(TGF-β1) and CD39 remained higher despite early treatment. Additionally, the increase in LAP(TGF-β1)+ Tregs and extra-thymic Helios-FoxP3+ Tregs overtime during HIV infection were consistent with higher demethylation of conserved non-coding sequence (CNS)-1 in the foxp3 gene, which is induced by TGF-β1. Notably, LAP(TGF-β1)-expressing Tregs in EC and IC were significantly higher than uninfected subjects, while the markers of Treg activation, migration, and function remained similar in these individuals.

Conclusions: Early ART initiation was unable to control the levels of immunosuppressive Treg subsets and their gut migration potential, which could ultimately contribute to gut tissue fibrosis and disease progression.

42

Characterizing the Role of PSGL-1/CD162 in the HIV-1 Envelope

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While the envelope glycoprotein gp120 is often viewed as the sole target on the surface of HIV virions for vaccines and therapeutics, numerous cellular proteins can also be incorporated into the viral envelope during viral egress (budding). While many cellular proteins have been documented in the HIV envelope, few have been well characterized for their impacts on HIV infection. Recently, the cellular protein P-Selectin Glycoprotein Ligand-1 (PSGL-1/CD162) was identified as a novel host restriction factor that is present in the HIV envelope. The CD162 protein was also shown to have inhibitory effects in other enveloped viruses, including influenza A, SARS-CoV-2 and murine leukemia virus. While the mechanisms by which CD162 reduces viral infection have been characterized, little is known on the mechanism behind incorporation of the protein into the HIV envelope. Similarly, no work has shown whether CD162 retains its biological function of binding to its receptor (P-selectin/CD62P) when present on virions. Here we show that CD162 is incorporated at a higher level than other previously described cellular proteins within the HIV envelope through both semiquantitative and quantitative techniques (antibody-based virus capture and flow virometry, respectively). Through the former we noted differential amounts of CD162 incorporated in viruses produced through transfection and infection. Using flow virometry we derive the most accurate estimates of the number of CD162 proteins on individual virus particles to date. Further, we show that CD162 incorporation employs a Gag-dependent mechanism, although other viral proteins may support optimal levels of incorporation. Finally, we demonstrate that CD162 on virions retains its ability to bind its cognate receptor (P-Selectin) which may have implications on how the virus is trafficked throughout the body, suggesting that the protein may play a more complex role in infection in vivo than what has currently been proposed.

53

HIV-1 and IFN-I modulate the composition of the nuclear envelope proteins

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Nuclear pore complexes (NPCs), made up of nucleoporins (Nups), are the main channels for the transportation of macromolecules and molecular complexes between cytoplasm and nucleus. Previously it has been shown that Nups such as Nup153 and RANBP2 directly interact with the HIV-1 capsid protein (CA), modulating nuclear entry and DNA integration into the host genome. Cell-autonomous innate immune mechanisms might be activated upon HIV-1 infection, leading to the secretion of type I interferons (IFN-I) that induce antiviral responses through the expression of many antiviral restriction factors (effectors). One of the restriction factors, Mx2, uses NPCs for its targeting of HIV-1 CA. We postulate that NPCs are involved in the innate response to HIV-1 infection; specifically, we hypothesize that HIV-1 and IFN-I modulate the composition of NPCs. Label-free quantitative mass spectrometry (MS) was performed on nuclear membrane extracts from monocytic cells infected with HIV-1 vectors with and without IFN-β treatment. Using this approach, we quantified 33 different Nups and 4813 other proteins. Around 7.52 % proteins showed significant variation upon infection and/or IFN-β treatment including one Nup, Translocated Promoter Region (TPR) and the NPC associated protein vimentin. We also exploited the generated MS data to quantify the HIV-1 proteins present at the nuclear envelope at the early stages of infection. Interestingly, CA and other Gag proteins were more abundant at the nuclear envelope following IFN-β treatment. To investigate the possibility that Mx2 is the restriction factor responsible for sequestering HIV-1 at the nuclear membrane upon IFN-I treatment, we generated Mx2-knockdown cells. MS and immunofluorescence microscopy experiments underway will provide clarification on a possible role for Mx2 in this phenotype. This project constitutes the first MS-based characterization of nuclear pores in the early stages of HIV-1 and may lead to the identification of novel cellular targets for HIV-1-inhibiting drugs.

124

Enhancing or Antagonizing HIV-1 Latency through Depletion of Select SR Kinases

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Control of RNA processing plays a central role in the expression and replication of HIV-1. From a single transcript, over 69 viral mRNAs are generated through the process of alternative RNA splicing. Disrupting the balance of HIV-1 RNA processing inhibits virus replication. Control is mediated in part through the action of host SR proteins whose activity, in turn, is regulated by multiple SR kinases (CLK1-4, SRPKs). Our studies demonstrate that SR kinases play disparate roles in modulating HIV-1 gene expression. Depletion of CLK1 enhanced HIV-1 gene expression, loss of CLK2 or SRPK1 suppressed it, while CLK3 depletion had a modest impact. Altered HIV-1 protein expression reflected changes in viral RNA accumulation. The opposing effects of CLK1 vs CLK2 depletion were due to action at distinct steps; loss of CLK1 increasing HIV-1 promoter function while depletion of CLK2 affected steps post-initiation. Loss of CLK1 also enhanced the response to several latency reversing agents, in part, by increasing the frequency of responding cells, consistent with a role in regulating provirus latency. To determine if modulation of SR kinase function by small molecules could be used to control HIV-1 replication, we screened the GSK library of kinase inhibitors and identified two compounds that suppress HIV-1 gene expression/replication with EC50~ 50 nM. The compounds resulted in dramatic suppression of HIV-1 proteins and viral RNA accumulation with minimal impact on cell viability. The compounds inhibited CLK1 and CLK2 but not CLK3 function and altered expression/activity of select SR proteins in cellulo. These findings demonstrate the unique roles individual SR kinases play in regulating HIV-1 gene expression and validate the targeting of these functions by small molecules for therapeutic benefit to enhance latency reversal, essential for “Kick-and-Kill” strategies, or to silence HIV protein expression for “Block-and-Lock” strategies.

189

Th17 cell master transcription factor RORC2 regulates HIV-1 gene expression and viral outgrowth

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During HIV-1 infection, Th17-cells are highly susceptible to infection and depleted from mucosal sites, resulting in mucosal barrier integrity alterations, microbial translocation, systemic inflammation, and disease progression. Additionally, HIV-infected Th17-cells can be long-lived and harbor viral reservoirs(VR) in people living with HIV(PLWH) receiving antiretroviral therapy(ART). Thus, Th17-cells are key players in HIV pathogenesis and VR persistence. Here, we evaluated the role of RORC2, the master regulator of Th17-cell differentiation, on HIV replication and outgrowth.
Memory CD4+T-cells were isolated from PBMCs of HIV-uninfected individuals(HIV-), ART-treated(ART+PLWH) and untreated(ART-PLWH) PLWH by negative selection using magnetic beads. Subsequently, cells expressing the Th17 markers RORC2 and CCR6 were isolated by FACS. The NL4.3BAL and THRO-HIV-1 strains were used for infections in vitro. A viral outgrowth assay(VOA) was performed with cells from ART+PLWH and ART-PLWH. HIV replication/outgrowth were evaluated by FACS and ELISA. HIV integration was evaluated by nested real-time PCR. RORC2 silencing in Jurkat cells and primary T-cells was performed. RORC2 overexpression was performed in 293T and Jurkat cells infected with VSV-G-pseudotyped HIV-1LAI env-GFP(HIV-1GFP). For Chromatin immune precipitation(ChIP) experiments, Jurkat cells transduced with a retroviral vector expressing RORC2-myc were infected with HIV-1GFP. Real-time PCR signal for HIV-LTR-NRRE-1 and HIV-CS-Pol was subsequently evaluated.

The inhibition of RORC2 by tool small molecule decreased HIV replication in CD4+T-cells in vitro, as well as viral outgrowth from T-cells of ART+PLWH and ART-PLWH. Consistently, RORC2 expression was higher within HIV-p24+ compared to total T-cells in ART-PLWH. Moreover, CCR6+RORC2+ compared to CCR6-RORC2- T cells of ART+PLWH were enriched in proviral DNA ex vivo. Furthermore, RORC2 silencing inhibited HIV-1 infection, specifically in CCR6+T-cells, whereas RORC2 overexpression led to enhanced viral replication. Finally, RORC2 promoted viral gene expression and ChIP revealed that RORC2 binds to the HIV-1 promoter.
Altogether, these results point to RORC2 as a new Th17-specific target for HIV-1 therapy.

214

Interception of HIV-1 replication by membrane trafficking network proteins.

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HIV-1 hijacks host protein function at multiple steps for its replicative advantage including host proteins involved in membrane trafficking, dynamics and fusion, directed transport, endocytosis, and autophagy. Despite their potential as possible targets for novel anti-viral therapies, only a few membrane trafficking proteins have been characterized to serve roles in HIV-1 replication. To elucidate their roles during HIV-1 replication, we performed a CRISPR-Cas9 screen of 140 membrane trafficking proteins. This led to the identification of host proteins whose knockout (KO) resulted in significant decreases in HIV-1 infectivity in CD4+ TZMbl reporter cells. Several of these host proteins had previously been characterized as intrinsic or related to autophagy- and clathrin-mediated endocytic pathways. As one example of a protein identified in this screen, PICALM, is known to regulate autophagy and is also a host dependency factor for other viruses such as herpes simplex virus (PMID: 31853228). To gain insight into how this and other membrane trafficking protein hits assist HIV-1 replication, we edited these genes to create stable SUP-T1 KO T-cell lines. After analyzing these KO cell lines, we found that the absence of certain host proteins, including PICALM, reduced viral entry by more than 2-fold. In addition, we found changes in autophagic flux resulting in altered intracellular trafficking and abundance of viral genomic RNA and HIV-1 Gag. This work will decipher the mechanisms by which membrane trafficking contributes to HIV-1 pathogenesis and will provide new targets with therapeutic potential.

226

HIV-1 Vpr Degrades the Polycomb Complex Component BCOR to Counteract Provirus Transcriptional Silencing

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T-follicular helper cells (TFH) express high levels of B-cell Lymphoma 6 (BCL6) transcription factor, and help B-cells throughout development and activation. During HIV infection TFH are productively and latently infected at a higher frequency than other CD4 T-cell subsets. These characteristics mark TFH as a substantial barrier to HIV cure. It is established that the well conserved accessory protein viral protein R (Vpr) induces a G2/M cell cycle arrest in cycling cells but its function during HIV infection remains elusive. In an HIV-1 Vpr BioID analysis, we identified the Polycomb complex component BCL6 co-repressor (BCOR) as a potential target of Vpr. The BCL6/BCOR complex is well characterized to silence genes based on CPG rich regions. Using a Vpr inducible HeLa cell line, we show that Wild-Type (WT), and cell cycle arrest-defective Vpr mutants deplete endogenous BCOR but not a mutant defective in recruiting the Cul4a-DDB1-DCAF1 (DCAF1com) E3 ligase ubiquitin complex. Using this system, we knocked down DCAF1 by siRNA and confirmed that it is essential for Vpr-dependent BCOR depletion. These results imply that DCAF1com recruitment but not G2/M cell cycle arrest is required for BCOR depletion. We further show that Vpr-dependent BCOR degradation requires a functional proteasome. Importantly, we also show that Vpr is essential for BCOR degradation during HIV infection, and that BCOR is highly expressed in latently but not productively infected cells. Knockdown of BCOR in latently infected cells is sufficient to reactivate HIV-1. Finally, CHIP-qPCR analysis showed that BCOR occupies the HIV-LTR in latently infected cells. Our results raise the possibility that Vpr drives BCOR degradation via DCAF1com to evade transcriptional silencing of provirus, potentially increasing productive infection of TFH.

134

Binding and neutralizing activity of a dimeric IgA version of an oligomannose-specific broadly neutralizing antibody to HIV-1

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HIV broadly neutralizing antibodies (bnAbs) represent tools to guide prophylactic strategies. Most bnAbs have been cloned as IgG, and their protective ability at mucosal surfaces is typically evaluated in that format. However, superior protection by dimeric IgA (dIgA) against HIV mucosal challenge has been reported in a few studies. Mucosal IgA has also been suggested as a correlate of protection in HIV highly exposed seronegative individuals. While past evaluation of HIV-specific dIgA includes antibodies to the gp120 V3 loop and CD4-binding site, here we report on a first step to evaluate the HIV-neutralizing activity and protective ability of bnAb PGT128 in a dIgA format. PGT128 binds a conserved patch of oligomannose-type glycans on HIV Env that is of interest to vaccine design. Recombinant PGT128 dIgA2, chosen for evaluation first because of the higher proportion of IgA2 in colonic and vaginal external secretions in people, was expressed in 293F cells and purified by affinity chromatography. In an ELISA inhibition assay, PGT128 dIgA2 incubation with an HIV-1 SOSIP trimer in solution resulted in ~5-fold greater inhibition of antigen capture onto ELISA plate wells coated with PGT128 IgG compared to incubation with PGT128 IgG, which suggest that the greater valency of PGT128 dIgA2 allows it to bind more avidly. When assayed in a pseudovirus-based neutralization assay at equimolarity, PGT128 dIgA2 exhibited 2- to 3-fold greater potency than the IgG, suggesting that dIgA2 valency increases binding avidity for Env on the surface of virions. Studies are now underway to assess dIgA1. Nevertheless, our results so far provide impetus for probing whether at least the dIgA2 form of PGT128, alone or in combination with IgG, might offer better protection against mucosal HIV challenge than the IgG form alone. Such insight would be informative to ongoing efforts to elicit oligomannose-specific bnAbs like PGT128.

154

SARS-CoV-2 RNA quantification using droplet digital RT-PCR

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Background: Quantitative viral load assays hold the potential to advance COVID-19 control and prevention, but SARS-CoV-2 viral load tests are not yet widely available. SARS-CoV-2 molecular diagnostic tests, which typically employ real-time reverse transcriptase-polymerase chain reaction (RT-PCR), yield semi-quantitative results. Reverse transcriptase droplet digital PCR (RT-ddPCR) offers an attractive platform for SARS-CoV-2 RNA quantification.

Methods: Eight primer/probe sets developed for real-time RT-PCR-based SARS-CoV-2 diagnostic tests were evaluated for use in RT-ddPCR (Charité-Berlin E-Sarbeco; Pasteur Institute IP2, IP4; US-CDC-N1; Chinese CDC ORF, N; Hong Kong University ORF, N). Synthetic SARS-CoV-2 RNA standards of known copy number were used to determine assay analytical efficiency, precision and limits of quantification and detection. SARS-CoV-2 RNA viral loads and real-time RT-PCR cycle threshold (Ct) values (LightMix® 2019-nCoV real-time RT-PCR assay, E-gene target) were measured in a convenience panel of 48 COVID-19-positive diagnostic specimens.

Results: We identified three primer/probe sets, E-Sarbeco, IP2 and IP4, as the most efficient, precise and sensitive for RT-ddPCR-based SARS-CoV-2 RNA quantification. Analytical efficiency of the E-Sarbeco primer/probe set, for example, was ~83%, while assay precision (coefficient of variation) was ~2%. Lower limits of quantification and detection for this primer/probe set were 18.6 and 4.4 input SARS-CoV-2 RNA copies/reaction, respectively. SARS-CoV-2 RNA viral loads in COVID-19-positive diagnostic specimens spanned a 6.2log10 range, confirming substantial viral load variation in vivo. We calibrated SARS-CoV-2 E gene copy numbers against cycle threshold (Ct) values. The resulting log-linear relationship can be used to mathematically derive SARS-CoV-2 RNA copy numbers from Ct values.

Conclusion: Primer/probe sets for real-time RT-PCR-based COVID-19 diagnostic tests can be migrated to RT-ddPCR for SARS-CoV-2 RNA quantification. Mathematical inference of SARS-CoV-2 copy numbers from COVID-19 diagnostic test Ct values, possible via calibrations described above, will allow the wealth of existing diagnostic test data to be harnessed to answer foundational questions in SARS-CoV-2 biology.

249

An Inter-Laboratory Genomic Cross-Validation of a COVID-19 Outbreak in a Long-Term Care Facility

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Between June 9 and August 31 2020, a long-term care facility in British Columbia experienced a prolonged COVID-19 outbreak. We describe our inter-laboratory effort to cross-validate whole-genome SARS-CoV-2 sequencing and bioinformatic methods and characterize outbreak viral dynamics.

Three independent laboratories sequenced available SARS-CoV-2 diagnostic specimens linked to the outbreak using Illumina MiSeq or Oxford Nanopore MinION platforms. Raw sequence data were processed using MiCall (MiSeq), BugSeq (MinION) or ARTIC (MinION) bioinformatic pipelines. For each specimen with sufficient material, at least two labs attempted sequencing with discrepancies resolved by a third. Consensus sequences representing the majority nucleotide at each position were compared for concordance, ignoring any positions with missing data. Single nucleotide polymorphisms were identified relative to a presumed founder virus.

Eighty-nine individuals were linked to the outbreak. Of the 65 specimens with Ct<30, 59 (90.7%) were successfully sequenced, while six sequences (25%) were sequenced from the remaining 24 specimens with Ct>30. In total, 65 (73.0%), 54 (60.7%) and 25 (28.1%) samples were sequenced in one, two or all three labs respectively. Pairwise nucleotide concordance between labs was >99.995%, with over 51.2% of sequence comparisons being identical. Non-identical sequences differed by a median of 1 [Q1-Q3: 1-2] nucleotide. Inter-lab concordance was generally higher for sequences collected on the same platform. Three samples collected early in the outbreak yielded identical sequences; this was presumed the outbreak founder virus. Subsequent samples over two months acquired up to five mutations relative to it, with 49 unique mutations observed across all outbreak sequences.

Inter-laboratory whole-genome SARS-CoV-2 sequence concordance was high despite sequencing/bioinformatics platform differences. Minor discrepancies nevertheless underscore the importance of laboratory cross-validation if sequencing is used to characterize emerging variants or to classify sequences as outbreak-related, as determination of genetic relatedness for SARS-CoV-2 can be influenced by as few as one nucleotide polymorphism.

121

The frequency of NKG2C+ adaptive NK cells in HIV+CMV+ subjects declines with age

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Background: 94% of HIV+ persons in the Canadian HIV and Aging Cohort Study (CHACS) are cytomegalovirus (CMV) co-infected. CMV infection drives the expansion of Natural Killer (NK) cells expressing the NKG2C activating receptor. HIV/CMV co-infection drive the expansion of NKG2C+ adaptive-like NK (adaptNK) cells to levels higher than that seen in CMV-mono-infected persons. However, these observations were made using samples from young individuals often aged <40 yrs. We questioned whether this was also the case for older CMV+ persons.

Methods: We studied 139 CMV+ individuals (n=89 ART treated HIV+; n=50 HIV-). Both HIV+ and HIV- groups were dichotomized by age (>40 vs <40 yrs). HIV+/- persons >40 yrs old were from the CHACS; those <40 yrs old were from the Montreal Primary Infection or the St Luc Injection Drug User Cohorts. Of those HIV+, 64 were >40 and 25 were <40 yrs old. Of those HIV-, 36 were >40 and 14 were <40 yrs old. Frozen and thawed PBMCs were stained for extracellular CD3, CD56 and NKG2C. We assessed the frequency (%) of NKG2C+ cells among CD3-CD56dim adapNK cells.

Results: As previously reported, young HIV+CMV+ subjects had a higher % of NKG2C+ adapNK cells than similarly aged CMV-mono-infected persons (median 50% versus 13.3%, respectively, p=0.02 Mann-Whitney test]. However, older HIV+CMV+ and CMV-mono-infected subjects had NKG2C+ adaptNK cell %s that were not significantly different (20% versus 14.2%, p=0.15 Mann-Whitney). The % of NKG2C+ adaptNK cells was negatively correlated with age (r= -0.23, p=0.04, Spearman correlation).

Conclusion: The higher % of NKG2C+ adaptNK cells in HIV+CMV+, versus CMV-mono-infected, persons is age-dependent; NKG2C% declines with age such that in those >40 yrs old their % is no longer significantly higher than that seen in CMV-mono-infected individuals. The mechanism underlying the decline in NKG2C+ adaptNK cell frequency requires further investigation.

236

Type I interferons and Interleukin 1 expression in Mycobacterium tuberculosis infection

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Background: Interleukin -1α and IL-1β are pro-inflammatory cytokines induced by M. tuberculosis (Mtb) infection that drive resistance to infection. Murine studies reveal IL-1α, not IL-1β, is the main mediator of these protective innate responses. Mtb also induces production of interferon α/β, which in mouse studies negatively regulate IL-1α and IL-1β potentially driving progression from latent infection to active tuberculosis (TB). The IL-1s inhibit IFN α/β levels through a negative feedback mechanism. However, the effects of individual IFN subtypes (IFN-α and IFN-β) on IL-1α and IL-1β in clinical phenotypes of Mtb infection in humans have not been defined.

Hypothesis: Stimulation of peripheral blood mononuclear cells (PBMCs) with IFN-α or IFN-β suppresses IL-1A mRNA expression more than the IL-1B gene in Mtb infection.
Methods: PBMCs from 11 healthy controls (HC), 12 tuberculin skin test (TST) positive, IFN-γ-release assay (IGRA) negative individuals [TST+IGRA-] (TST), 19 IGRA-positive individuals (LTBI); and 19 active TB patients (ATB) were stimulated with either IFN-α or IFN-β then assessed for expression of IL-1A and IL-1B mRNA using qPCR.

Results: In unstimulated samples, higher expression of IL-1A and IL-1B mRNA were observed in LTBI and ATB relative to healthy controls; the expression of these genes was lower in LTBI compared to ATB. Stimulation with type I IFNs downregulated the expression of IL-1A and IL-1B in all the clinical phenotypes, with IL-1A mRNA suppressed more than IL-1B. Higher suppression of the genes was observed in LTBI compared to ATB; this suppressive effect was greater with IFN-β than with IFN-α.

Conclusion: Our study supports the concept that IFN-α and IFN-β suppress IL-1A and IL-1B expression in Mtb infection. Our findings also demonstrate differences in the effects of IFN-α- and IFN-β on the expression of IL-1A and IL-1B that may contribute to TB disease progression.

10

Safety and Efficacy of F/TAF and F/TDF for PrEP in DISCOVER Participants Taking F/TDF for PrEP at Baseline

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The DISCOVER trial randomized men who have sex with men and transgender women at risk for HIV to receive blinded daily emtricitabine plus tenofovir alafenamide (F/TAF) or tenofovir disoproxil fumarate (F/TDF) for HIV pre-exposure prophylaxis (PrEP) for at least 96 weeks. DISCOVER included participants already taking F/TDF for PrEP at baseline (BL), creating a unique opportunity to investigate estimated glomerular filtration rate (eGFR), markers of renal proximal tubular function (RBP and β2M to creatinine ratios), and fasting cholesterol levels and bone mineral density (BMD).

905/5387 (16.8%) participants were on BL F/TDF for PrEP for a median duration of 399 days. HIV incidence was low in participants taking BL PrEP. There was one HIV infection among BL PrEP users, in a participant randomized to F/TDF who had intermittent low adherence.

Participants on BL PrEP randomized to F/TAF had improvements in eGFR and markers of proximal tubular function compared to F/TDF. Median change in BMD was not statistically different for BL PrEP users assigned to F/TAF vs F/TDF, however de novo F/TAF participants had improved BMD profiles compared to F/TDF. BL PrEP users in the F/TAF arm had increases in LDL cholesterol (median +6mg/dL) compared to F/TDF, while changes in HDL and total:HDL ratio were similar. Lipid-modifying agent (LMA) initiation in BL PrEP users was more frequent in the F/TAF arm, while LMA initiation in de novo PrEP participants was similar between arms.

Participants who switched from F/TDF to F/TAF had improvements in renal biomarkers and there was no difference in BMD among BL PrEP users. The observed lipid changes in BL PrEP users are consistent with the LDL and HDL suppressive effect of TDF, and the small but higher rate of LMA initiation with F/TAF is likely related to withdrawal of this effect.

11

Lenacapavir Resistance Analysis in a Phase 1b Clinical Proof-Of-Concept Study

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Lenacapavir (LEN, GS-6207) is a first-in-class subcutaneous (SC) long acting inhibitor of HIV-1 capsid protein (CA) function, which can be administered every 6 months. We conducted a phase 1b proof-of-concept study in which people with HIV (PWH) received a single SC injection of LEN 20, 50, 150, 450, or 750 mg. LEN demonstrated potent antiviral activity with up to 2.3 log10 decline in HIV-1 RNA after 9 days of monotherapy. Here we describe the resistance analyses for all participants.

Study 4072 is a double-blind, placebo-controlled, dose-ranging, randomized (3:1; n=8/group) study in PWH who were capsid inhibitor-naive. Resistance analyses were performed for all participants prior to study entry and at the end of monotherapy using genotypic and phenotypic Gag-Pro assays (Monogram Biosciences) and next-generation sequencing (NGS; Seq-IT). Samples were evaluated for the emergence of CA mutations and/or change in phenotypic susceptibility to LEN.

Thirty-nine PWH enrolled in the study, 29 receiving LEN and 10 receiving placebo. All PWH responded to LEN with no rebound. In the pre-treatment analysis, none had HIV-1 harboring resistance mutations to LEN, with all having wild-type (WT) phenotypic susceptibility to LEN. Post-monotherapy analyses revealed the emergence of CA mutation Q67H at Day 10 in 2 participants. One participant (20 mg group) had a Q67Q/H mixture detected both by population and NGS analysis, and another participant (50 mg group) had a Q67H mutation, detected only by the NGS analysis. No other substitutions were observed in the CA protein.

Overall, emergence of resistance to LEN was rare and only occurred well below exposures expected to be achieved in Ph2/3 studies, with the emergence of a single mutation Q67H. These results support further evaluation of LEN as a long-acting antiretroviral agent in PWH.

13

Islatravir Metabolic Outcomes in Phase 2B Trial of Treatment-Naïve Adults with HIV-1

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Background: Islatravir (ISL, MK-8591) is the first nucleoside reverse transcriptase translocation inhibitor (NRTTI) in development for the treatment of HIV-1 infection. We evaluated changes in bone mineral density (BMD), body fat distribution, and related metabolic endpoints (weight, body mass index [BMI], fasting glucose and lipid levels), in a double-blind, dose-ranging trial of ISL in a combination antiretroviral regimen.

Methods: Treatment-naïve adults with HIV-1 were randomized to once-daily ISL (0.25mg, 0.75mg, or 2.25mg) with doravirine (DOR, 100mg) and lamivudine (3TC, 300mg) or to the fixed-dose combination DOR/3TC/TDF. Participants receiving ISL who achieved HIV-1 RNA <50copies/mL at Week 20 or later stopped 3TC (usually at Week 24) and continued DOR+ISL at their initial dosage. Hip BMD, spine BMD, peripheral fat, and trunk fat were assessed by dual-energy x-ray absorptiometry (DEXA) at Weeks 0 and 48 and evaluated by a central imaging reader. Change from baseline to Week 48 was calculated for each DEXA endpoint, weight, BMI, and fasting plasma glucose, total cholesterol, high-density lipoprotein cholesterol (HDL-C), low-density lipoprotein cholesterol (LDL-C), and triglycerides.

Results: 121 participants (92.6% male, 76.0% white, mean age 31 years) received study therapy and were included in the analyses. At baseline, the mean CD4+ T-cell count was 492cells/mm3 and 22% of participants had HIV-1 RNA>100,000copies/mL. Changes in metabolic endpoints from baseline to Week 48 are shown below (see table).

Conclusions: The ISL regimens, regardless of dose, demonstrated minimal BMD impact and similar changes in fat distribution, weight, and BMI compared to the DOR/3TC/TDF group, through 48 weeks of treatment.

14

Switching to Bictegravir/Emtricitabine/Tenofovir Alafenamide (B/F/TAF) in Adults Aged >65 or Older

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Older individuals are at increased risk of co-morbidities and polypharmacy, so ensuring the safety and tolerability of ART in older PLWH is critical. In this ongoing 96-week study, we evaluated the efficacy and safety of switching participants ≥65 years to single-tablet B/F/TAF in a phase 3b open-label study.

Virologically suppressed (HIV-1 RNA <50 copies/mL) participants >65 years old currently receiving either E/C/F/TAF or a TDF-based regimen were switched to B/F/TAF. The primary endpoint was HIV-1 RNA <50 copies/mL at Week(W) 24 as defined by the FDA Snapshot algorithm. Here we report efficacy and safety outcomes at W72.

86 participants were enrolled at sites from 5 European countries; median age was 69 years (range 65-80); 13% were female, and 99% were White; 92% were receiving E/C/F/TAF at baseline.

At W72, HIV RNA <50 copies/mL was 93% (80/86); 6 (7%) had no virologic data in window (4 discontinued study drug due to AE but had last available HIV-1 RNA <50 copies/mL and 2 had no data within the window but were still on study drug). Using the missing=excluded analysis, HIV RNA <50 copies/mL was 100% at W72. There were no virologic failures or emergent resistance. Median change in CD4 count was 53 cells/mm3 (IQR: -49, 120). There were 2 (2%) Grade 3-4 study drug-related adverse events (AEs). Four AEs led to premature study drug discontinuation; 1) abdominal discomfort (grade 2, drug-related), 2) alcohol withdrawal, 3) benzodiazepine withdrawal, 4) suicide. There were no serious AEs that were study drug-related. There were 7 Grade 3 and 1 Grade 4 laboratory-related AEs reported, with the Grade 4 being hyperkalemia. There were no discontinuations for renal, bone or hepatic AEs.

Through W72, B/F/TAF was safe, well tolerated with high rates of virologic suppression in PLWH ≥65 years who switched to B/F/TAF.

111

Bictegravir/Emtricitabine/Tenofovir Alafenamide in Patients with Genotypic NRTI Resistance

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Background: Bictegravir/emtricitabine/tenofovir alafenamide (BFT) is approved for treatment of HIV without known resistance to its 3 components. Several studies have demonstrated efficacy of BFT in patients with NRTI resistance associated mutations (RAMs), mainly identified by proviral DNA, a technique not available in Canada. We evaluated BFT in patients with NRTI RAMs identified by routine genotyping.

Methods: Retrospective analysis of adults receiving BFT. Patients were identified through a search of electronic health records, and eligibility confirmed by review of individual patient records. Included patients had genotypically documented 2019 IAS-USA major RAMs affecting NRTIs and at least one HIV viral load (VL) after starting BFT.

Results: 42 patients met study criteria. The mean age was 54 years, the mean proximal CD4 count was 634 cells/mm3, and 28 (67%) were male. 39 were virologically suppressed when BFT was initiated, two were treatment naïve and one had a VL of 961 copies/mL on antiretroviral therapy (ART). 25 had one NRTI RAM (20 were M184V/I), 8 had 2 NRTI RAMs, 3 had 3 NRTI RAMs, 3 had 4 NRTI RAMs, 2 had 5 NRTI RAMs and 1 had 7 NRTI RAMs plus a 69 insertion. No patient had K65R/E/N. 19 patients also had major NNRTI RAMs and 15 had major protease RAMs, but none had documented integrase resistance. At the last VL measurement on BFT, a mean of 8 months after starting BFT, 41 of 42 had VL <40 copies/mL. One patient who had a VL <40 copies/mL two months after starting BFT, had a VL of 67 copies/mL 14 months after starting BFT. This patient had well documented past history of poor adherence and had no new RAMs identified in the sample 13 months after starting BFT.

Conclusions: BFT was effective in maintaining HIV VL suppression in patients with genotypically documented NRTI RAMs.

18

Web-based HIV Drug Interaction Checkers: Comprehensiveness and Concordance of the Toronto and Liverpool Databases

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Background: Drug interactions (DI) between antiretroviral (ARV) and non-ARV drugs can lead to toxicity or treatment failure. The Toronto General Hospital Immunodeficiency Clinic (Toronto) and University of Liverpool (Liverpool) maintain web-based, HIV-focused DI checkers. We evaluated the comprehensiveness and concordance of these databases using a “real-world” sample of medications dispensed to HIV patients.

Methods: A list of non-ARV drugs dispensed to HIV-infected, ARV-treated British Columbians age ≥19 years was extracted from the population-based Seek and Treat for Optimal Prevention of HIV/AIDS cohort. Drugs included outpatient dispensing between 01-Jan-2010 and 31-Dec-2016. Four HIV healthcare providers checked each non-ARV drug for DI with all available ARVs using the Toronto and Liverpool databases (accessed May-September 2019).
Database comprehensiveness was calculated as the percentage of non-ARV drugs included. ARV+non-ARV pairs having the same DI severity classification in both databases were considered concordant (see Table). Comprehensiveness and concordance were calculated overall, and by non-ARV drug class.

Results: Of 659 non-ARV drugs, Toronto included 378 (57%) and Liverpool 432 (66%), with 316 (48%) in both. Overall, 75% of drugs were present in at least one database, with 9% only in Toronto and 18% only in Liverpool. Of 15,058 ARV+non-ARV pairs evaluated, 5,254 (35%) were listed in both databases, with 4,219 (80%) concordant (see Table). Discordant classifications were due to international differences between drug monographs and/or interpretation of DI literature.

Conclusions: Combined use of Liverpool and Toronto HIV DI-checkers enhances the comprehensiveness of DI information. Discordance is infrequent, and provides insight into different interpretations of DI literature.

80

Using a virtual classroom model to build HIV treatment capacity in Saskatchewan: Continued success during the ongoing COVID-19 pandemic

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Objective: Using a Virtual Classroom (VC) model to address the demand for HIV medical education and to enhance capacity to test and treat HIV among Saskatchewan's primary care providers.

Approach: The novel VC was launched in 2018 as an online, small-group platform to deliver HIV medical education to Saskatchewan health care providers. Despite the COVID-19 pandemic, interest for the VC has grown. Due to this, four sessions were offered (two more than originally planned) between April-December 2020 to a total of 39 participants. A post-evaluation survey was developed and sent by email to the first cohort. The survey administered to the last three sessions was modified slightly. The data were analyzed using descriptive techniques.

Results: A total of 22 surveys (56% response rate) from all four sessions were collected. Results from these surveys together indicate that 95% of participants (21/22) either "strongly agree" or "agree" that they know: how to order an HIV test and interpret the results; the various methods of HIV prevention; which tests to order for early visits; how to counsel patients on medical adherence; and approaches to long-term HIV management. All survey respondents either "strongly agreed" or "agreed" that they are aware of what issues to consider when starting anti-retroviral (ARV) treatment; can identify complicated situations and special populations; and can assess readiness to begin ARV treatment. All 18 participants from the last three sessions showed an average 4-point increase (scale:1-10) in confidence providing HIV primary care. Since the beginning of the HIV VC, 18 primary care providers have become approved ARV prescribers for Saskatchewan (10 in 2019; 8 in 2020).

Conclusion: These findings suggest that the VC continues to be a promising and effective model for educating primary care providers and enrolling new ARV prescribers in Saskatchewan despite an ongoing global pandemic.

94

Uncertainty and Living Strategy Use among Adults Living with HIV during the COVID-19 Pandemic

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Objective: To describe uncertainty experienced by adults living with HIV and self-care living strategies used during the COVID-19 pandemic.

Methods: We conducted a cross-sectional web-based survey between June-August 2020 with adults living with HIV. We recruited participants from a previous exercise study, supplemented by word of mouth. Participants completed questionnaires about disability (HIV Disability Questionnaire), living strategies (frequency of strategy use and change since the pandemic in the following areas: maintaining control and healthy lifestyle; attitudes and beliefs; blocking the pandemic out of the mind, and social interaction), demographics, and COVID-19. We calculated median and interquartile ranges (IQR) for HDQ domain scores (range 0-100), higher scores indicating greater severity. We reported the proportion of participants who engaged in each living strategy ‘a few times a week’ or ‘everyday’ and the change in strategy use during the pandemic (increase/decrease/no change).

Results: Of 63 respondents, most (84%) were men, median age was 57 years (IQR:45,60), most (62%) were living alone, and few (25%) were working during the pandemic. Highest median HDQ severity scores were in the domains of uncertainty (median 30; IQR:16,43) and mental-emotional health (median 25: IQR:14,41). The majority (>50%) reported using 22 (60%) of 37 positive strategies ‘a few times a week’ or ‘everyday’ (most common pertained to maintaining a healthy lifestyle and positive outlook). Of the nine strategies (18%) reportedly changed during the pandemic, the most common related to social interaction (decreasing time spent with friends, colleagues or seeking company with others, increasing isolation, and increasing time interacting with others on the internet (27% engaged in this strategy ‘a few times a week’ or ‘everyday’).

Conclusion: Uncertainty and mental-emotional health challenges were the most severe dimensions of disability experienced by participants. Results can help to provide an understanding of disability and self-care strategy use during the COVID-19 pandemic.

183

Characterization of People Living with HIV in a Montreal-based Tertiary Care Centre with COVID-19 During the First Wave of the Pandemic

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Background: Compared to HIV-uninfected individuals, people living with HIV (PLWH) may be expected to have increased risk of developing symptomatic or severe COVID-19 disease due to underlying immunodeficiency. We characterized PLWH followed at a tertiary care clinic in Montreal who acquired COVID-19 and described their outcome during the first wave of the pandemic.

Methods: A retrospective chart review was performed for PLWH followed at the Chronic Viral Illness Service (CVIS) clinic with a positive COVID-19 nasopharyngeal PCR or symptoms suggestive of COVID-19 between March and June 2020. Data on demographics, socioeconomic status, co-morbidities, severity of COVID-19 and outcomes were extracted.

Results: Of 1702 individuals, 27 (1.6%) presented with a positive COVID-19 test (n=24) or symptoms suspicious for COVID-19 (n=3). Median age was 51 years [IQR 39, 58], 14(52%) were black, 9 (33%) had hypertension and 25 (93%) had been prescribed combined antiretroviral therapy. Most individuals (96%) earned $35000 dollars or less annually. Nine (35%) individuals worked in long-term care (LTC) homes while 3 (7%) lived in LTC homes and 4 (15%) were homeless. Median CD4 count was 596 cells/mm3 [342, 811] and 5 had detectable plasma HIV viral loads. Four persons were asymptomatic and most symptomatic individuals (86%) had mild disease.

Conclusion: As has been observed in the general population, PLWH attending the CVIS with COVID-19 had lower socioeconomic status and had employment or living conditions that put them at high risk for infection. Rather than stage of HIV infection, social determinants of health seem to have been a principal factor predisposing PLWH to COVID-19 during this first wave. Work is ongoing to identify additional cases of COVID-19 which may not have been captured during wave 1 due to lost patient contact, in addition to subsequent cases of COVID-19 during waves 2 and 3 of the pandemic.

196

Adapting Recruitment Strategies in Substance Use Research during the COVID-19 Pandemic

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Background: COVID-19 has disrupted the lifestyle of PWUD. To understand the effects of the pandemic on their overall wellbeing, and to improve response to the crisis, engaging with PWUD and hearing their stories is important. «Nothing about us, without us" is branded by advocacy groups and evidence shows the value of involving PWLE in research, substance use program, service, and policy development.

Objective: To assess the challenges of PWUD, during the second wave of the pandemic, 150 PWUD in Montreal were to be recruited in 15 weeks for phone interviews (September-December 2020), amidst restrictive public health measures.

Recruitment strategies: 1) Contacting PWUD from a cohort study contact list (phone, email, post; passive recruitment in 3 community resources).
When this failed to yield recruitment objectives, a research assistant with lived experience (RAWLE) was mandated to intervene which led to:
2) Optimizing and tailoring recruitment products and 23 added resources, based on RAWLE'S first-hand knowledge and experience.
3) Facilitating access to phone interviews by having RALWE on site with a research-issued cell phone.
4) Offering in-person interview option.

Results: Strategy 1: 6 interviews from Sept. 7-28
Strategies 1 and 2: 6 interviews from Sept. 29-Nov 1
Strategies 1, 2 and 3: 38 interviews from Nov 2-24
Strategies 2, 3 and 4: 77 interviews from Nov 25-Dec 18

Completed interviews = 128; Targeted N: 150.

Although we missed our target, the exponential growth of interviews after integrating a RAWLE in the recruitment strategies was significant. It required applying for an ethics amendment allowing in-person data collection, executing IPE protocols, training the RAWLE to be an interviewer.

Conclusion: Involving a RAWLE was the key to increasing weekly recruitment targets by 12 in a restricted context, contributing to the arguments for the implication of PWLE in research on substance use with PWUD.

225

Sociodemographic characteristics associated with higher numbers of COVID-19 cases: a neighbourhood level study in Ottawa, Ontario.

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There is a growing consensus that COVID-19 disproportionately affects vulnerable communities in Canada characterised by lower socioeconomic standing, recent immigration, as well neighbourhood factors. There is no socio-demographic information on COVID-19 infections at neighbourhood level in Canada.

Objectives: To explore the sociodemographic characteristics associated with higher numbers of COVID-19 cases at neighbourhood level in Ottawa guided by social determinants of health framework.

Methodology: Outcome variable of the total number of COVID-19 cases were extracted from a publicly available Ottawa Neighbourhood study (ONS). Explanatory variables included demographic (median age, population density, percentage of single parent family), socioeconomic (percentage of population with no high school diploma, speaks neither English nor French, recently immigrant, percentage of refugee population, percentage of black population), and neighbourhood level factors (perceived walkability score, percent of population living within 50m walking distance to healthcare centres). Data were analysed using linear regression methods.

Results: The neighbourhoods with relatively higher number of total COVID-19 cases were Hunt Club, Hintonburg, and Hawthorne Meadows. According to the findings, higher percentage of: newcomers (β=0.12, 95%CI=0.01-0.23), population aged 65 years and above (β=0.08, 95%CI=0.02,0.16), population density (β=0.12, 95%CI= 0.01-0.23) showed positive association with higher number of cases, while percentage of population living within 50m walking distance to healthcare centres (β=-0.19, 95%CI=-0.36, -0.03) showed an inverse association.

Conclusion: Higher proportion of newcomers, senior residents, and higher population density are significant risk factors of higher COVID-19 cases, and living within 50m of walking distance to the nearest health facility appeared to be a protective factor. It is important to note that and there is serious data gap on COVID-19 at neighbourhood level in most Canadian cities. This is an imperative for policy priority.

Key words: COVID-19 cases, socioeconomic risk factors, neighbourhood study, Ottawa.

109

Incidence Rate And Factors Associated With HIV-RNA Blips In Persons On ART In British Columbia

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Background: Persons living with HIV-1 (PLWH) who achieve viral suppression (VS) on ART may experience viral blips (VB) or low-level viremia (LLV). We described a cohort of individuals who achieved VS and subsequently developed VB or LLV and factors associated to VB.

Methods:
ART-naïve adults ≥19 years who commenced ART in British Columbia between January 1st 2010 and December 31st 2018 and achieved durable VS (3 consecutive plasma viral loads (pVL)<40 c/ml) with a minimum follow-up period of 12 months were included. VB was defined as an isolated pVL between 40 to 1000 c/ml returning to pVL <40 c/ml within 3 months, while LLV included those with persistent detectable pVL below 1000 c/ml. Multivariable Cox proportional hazard models adjusting for demographic and clinical variables, including ART were used to model the hazard of experiencing VB.

Results:
Of 2405 participants, 84% were male. At baseline median age was 41 years (Q1-Q3:32-49), CD4 count 360 cells/μL (Q1-Q3:219-540) pVL 4.73 log10 copies/mL (Q1-Q3:4.2-5.0), and 10% had ART resistance. During the study period 1507(63%) maintained VS, 322 (13%) had VB, 381 (16%) had LLV, 132 (5%) had viral failure and 63 (3%) lost to follow-up. The incidence rate for VB was 5.62 per 100 person years (95% CI:5.06-6.22). Only 4% of participants with VB and 2% with LLV experienced subsequent virologic failure. Factors associated with increased risk of VB included higher baseline pVL, (adjusted HR 2.38 [95% CI:1.75-3.24]) and longer time to VS, (adjusted HR 1.03 [95% CI:1.01-1.05]). ART was not associated with increased risk of VB.

Discussion:
This cohort of ART-naïve individuals who achieved VS had low incidence of viral blips that were associated with higher baseline pVL and longer time to VS. Subsequent virologic failure in individuals with VB or LLV was infrequently observed.

178

Action for Positive Brain Health Now: Protocol for a Randomized Controlled Trial using Goal Management Training

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Background: The evidence shows that many older people living with HIV (PLWH) could protect or improve their brain health through lifestyle change. Sustained lifestyle change is difficult for those with a chronic condition that affects cognitive ability, eroding the very executive functions needed for effective goal-directed behavior. Thus, the key question is how we can improve adherence to the most promising interventions. Goal Management Training (GMT) is an intervention that involves goal-setting, sustained attention, and feedback.

Objective: To estimate the extent to which GMT before a healthy lifestyle program (HLP) is associated with greater uptake of health recommendations, achievement of health-related goals, and better brain health among PLWH compared to the HLP alone.

Methods: Brain Health Now cohort members are eligible for this study. The main outcome will be adherence to the HLP, which is the number of physical activity weeks where adherence targets were met, (150 minutes per week) using an activity monitor. Social activities per week will be captured through self-report with confidential photo validation. The MyHealth app will be used to send pain, anxiety, depression, sleep, distress, fatigue and health perception questionnaires to the participants. Downstream outcomes will include health-related quality of life, cognitive ability, vascular risk profile, and social network size. All participants will receive a list of relevant local resources, a health coach, a goal-setting application, and access to an online goal-setting workshop. The intervention group will participate in 9 GMT sessions. All participants will enter the HLP for 52 weeks. Data will be analyzed using a linear regression model.

Implications: This work will contribute to the current literature regarding adherence to exercise interventions aimed at improving brain health. If successful, behavioural interventions such as GMT could be implemented as an adjunct to exercise interventions for people with cognitive impairment across many clinical populations.

245

Decision Conflict and Decision Support Needs of Prep-Eligible Black Patients in Toronto Regarding the Adoption of Prep for HIV Prevention

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Background: HIV pre-exposure prophylaxis (PrEP) is recommended for populations at high ongoing risk of infection. Research evidence shows that PrEP acceptance in Toronto among Blacks at risk of HIV is particularly low. Previous studies to optimize use of PrEP has focused on adherence, without consideration for the decision-making process required for adoption of PrEP as HIV preventive measure. This study examined the decision conflict and the decision support needs of Black patients that were offered PrEP for HIV prevention.

Methods: The Ottawa Decision Support Framework (ODSF) was used to guide the development of a key informant guide used for qualitative data collection. Black patients assessed by healthcare providers as meeting the basic criteria for starting PrEP were recruited through the St. Michael's Hospital Academic Family Health Team and clinical and community agencies in Toronto. Participants were interviewed by trained research staff. Qualitative content analysis was guided by the ODSF, and analysis was done using the Nvivo.

Results: Twenty-nine women and men (including men who have sex with men) were interviewed. Participants reported having difficulty in decision making regarding adoption of PrEP. The main reasons for decision-conflict regading PrEP adoption were: lack of adequate information about PrEP, concerns about the side effects of PrEP, inability to ascertain the benefits or risk of taking PrEP, provider's lack of adequate time for interaction during clinical consultation, and perceived pressure from healthcare provider. Participants identified detailed information about PrEP, and the ability to clarify how their values align with the risks and side effects of PrEP as their decision support needs.

Conclusion: PrEP-eligible Black patients that are prescribed PrEP have decision conflict. A decision support tool that incorporates the decision support needs of Black patients will reduce decision conflict and improve the decision making process for adoption of PrEP for HIV prevention.

29

Efficacy and Safety of Doravirine in Treatment-Naïve Adults ≥50 Years Old

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Background: Nearly 50% of people living with HIV in the US are ≥50 years old. Doravirine (DOR) is a next-generation NNRTI with activity against first-generation NNRTI-associated mutations, a neutral impact on lipids, and few drug-drug interactions with commonly used medications. We compared Week 96 results in treatment-naïve adults ≥50 vs <50 years old from 3 DOR trials (P007, P018, P021).

Methods: 855 participants received DOR 100mg +2 NRTIs or fixed-combination DOR/3TC/TDF; 383 participants received ritonavir-boosted darunavir (DRV) +2 NRTIs; and 472 received efavirenz (EFV) 600mg +FTC/TDF. Participants who received ≥1 dose of study drug were included. All analyses were done by descriptive statistics; the Observed Failure approach was used for missing efficacy data.

Results: Of 1710 participants, 187 (11%) were 50-70 (median 54) years old at study entry. The older cohorts (age ≥50 years) had more women, more participants with AIDS, and lower median CD4+T-cell counts than the younger cohorts (table). Hypertension and analgesic use were also more common in older participants. At Week 96, the older cohorts had more participants with HIV-1 RNA<50copies/mL and fewer discontinuations due to lack of efficacy. Mean change in CD4+T-cell count was similar between age cohorts in the DOR group. Rates of drug-related AEs and serious drug-related AEs were similar between age cohorts across all treatment groups. Discontinuations due to drug-related AEs were similar between age cohorts in the DOR group.

Conclusions: DOR is a beneficial option for adults ≥50 years old, given its similar efficacy and favorable safety profile compared to younger adults.

63

Tailoring Care for Frail and Lonely Older Persons with HIV

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Background/objectives: Forty to 60% of persons with HIV (PHW) report having experienced loneliness and 5 to 29% of PWH are frail depending on the method of study. Recently it has been shown that the hazard ratio of death in individuals who are frail and lonely or frail and socially isolated is 1.8-fold that of individuals who are neither frail, nor lonely or socially isolated.

Design: A cross-sectional study of PWH ≥ 50 years. Routine frailty assessment was performed using the Clinical Frailty Scale. Individuals who scored 4+ on the CFS completed a questionnaire to elucidate additional factors present in frail PWH, including loneliness, falls, impaired gait and balance, polypharmacy, unintentional weight loss, food insecurity, and subjective cognitive concerns.

Setting: An urban outpatient clinic in Calgary, Canada.
Participants Individuals with HIV aged 50+ years living in Southern Alberta, Canada.
Measurements Frailty screening was performed using the Clinical Frailty Scale. Loneliness was measured with 3-item Loneliness Scale. Descriptive statistics were performed using Stata version 16.

Results: Two-hundred and ninety-four PWH were screened for frailty using the CFS. The mean age was 59 years (range 50-86 years). Sixteen percent were female. Fifteen percent were frail based on a score of 4+ on the CFS. Of the frail PWH, 42% endorsed feelings of loneliness, 42% had fallen in the past one year and 55% reported impaired gait or balance. One-fifth reported unintentional weight loss and 33% experienced food insecurity. Nearly 40% reported subjective memory concerns.

Conclusion: In aging PWH, frailty and loneliness are prevalent. Given the increased risk of death when both are present, upstream and targeted interventions are urgently needed. These may include addressing loneliness, falls risk, weight loss, food insecurity and memory concerns.
Key Words: frailty, loneliness, social vulnerability, aging, Human Immunodeficiency Virus (HIV)

90

British Columbia CARMA-CHIWOS Collaboration (BCC3) Protocol – An Interdisciplinary, Community-Based Study of Healthy Aging By, With, and For Women Living With HIV

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Background: With ART, long-term comorbidities, quality of life, and longevity are priority concerns for people living with HIV. Findings from the Children and Women: AntiRetroviral Therapy and Markers of Aging (CARMA) study, which investigated biological aging, indicate that women living with HIV (WLWH) experience higher rates of comorbidities, hormonal abnormalities, and accelerated cellular aging compared to HIV-negative women. These outcomes are potentiated by high HIV viral loads and smoking. The Canadian HIV WOmen's Sexual and Reproductive Health Cohort Study (CHIWOS) operationalized "women-centered care" and "Meaningful Involvement of Women Living with HIV/AIDS", while investigating psychosocial and structural factors that impact women's healthy aging. Utilizing the strengths of CARMA and CHIWOS, BCC3 will comprehensively investigate intersecting factors that influence aging in WLWH using a cell-to-society and health equity approach.

Community collaboration: WLWH and community partners are engaged throughout all stages of this study, including Peer Research Associates and a Community Advisory Board representing WLWH, HIV/AIDS organizations, and clinicians.

Methods: We aim to enrol n=350 WLWH and n=350 HIV-negative women from 2020-2023. Participants will first attend a clinical visit, where biospecimens, anthropometric measurements, and clinical data will be collected. Biospecimens will be analyzed for markers of cellular aging and inflammation, hormone levels, and other chronic/latent viral infections. Within one month, participants will attend a community visit, where a Peer Research Associate will administer a comprehensive questionnaire regarding psychosocial and structural determinants of health. Using biospecimens and survey data, we will analyze how chronic inflammation, co-infection with chronic/latent viruses, hormonal irregularities, and psychosocial, behavioral, and structural factors impact markers of aging in immune cells and the development of comorbidities in WLWH and HIV-negative women.

Significance: The BCC3 study is uniquely positioned to investigate how these factors intersect as WLWH age, and inform best practices for comprehensive, holistic, women-centered care throughout their life course.

112

Preliminary Analysis of Comorbidity Risk Scores and Immune Aging Markers in Women over 45 Years old Living with or without HIV in the CARMA Cohort in British Columbia

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Background: People living with HIV are at higher risk of age-related comorbidities, even when treated with cART. There are limited data describing multiple comorbidity risk prediction scores in women living with HIV (WLWH). Our objective was to compare risk scores and immune aging markers-- leukocyte telomere length (LTL) and mitochondrial DNA (mtDNA) content--between WLWH and HIV-negative control women.

Methods: Demographic and clinical data from 122 WLWH and 81 controls aged >45y with visits between 2008-2018 in the Children and Women: AntiRetrovirals and Markers of Aging (CARMA) cohort were retrospectively reviewed. Framingham Risk Score (FRS), aspartate aminotransferase-to-platelet ratio (APRI), and Canadian Association of Radiologists and Osteoporosis Canada (CAROC) score were calculated for all participants. Liver-related death risk (LRD) score, Veterans Aging Cohort Study (VACS) index, and Chronic Kidney Disease (CKD) prediction scores were calculated for WLWH only. LTL and mtDNA were measured by qPCR.

Results: WLWH were younger than controls (median[IQR] 53[49-57] vs. 55[(50-59], p=0.028) but more likely to be current/past smokers (63% vs. 45%, p=0.016). A larger proportion of WLWH had APRI>0.7 (21% vs. 4%, p<0.001), and moderate/high CAROC scores (39% vs. 19%, p=0.029) compared to controls, indicating higher risks for hepatic fibrosis and 10-year fracture, respectively. FRS, which estimates 10-year risk of cardiovascular disease, did not differ between groups. Among WLWH, LRD (n=47) was 5.5[4.5-6.5] with 18.4% at medium-to-high risk, and CKD risk score was 7.0[3.0-12.0] with 68% at high risk of CKD. The VACS index predicted a 10.8[6.2-21.2]% risk of 5-year mortality. WLWH had shorter LTL than controls (6.6[6.1-7.3] vs. 7.4[6.8-8.0], p<0.0001), but no difference in mtDNA content was detected.

Conclusions: Among WLWH vs. controls, we observed shorter LTL as well as higher risk scores for liver and bone, but not cardiovascular disease. Further research is needed to determine how to better predict and prevent aging comorbidities in this population.

179

Physical deficits among People Living with HIV: A Critical Review

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Background: People living with HIV (PLWH) are living longer, but there is evidence that these individuals are experiencing an accentuated aging process. Physical impairments have not received much attention in the literature in comparison with the other consequences of aging with HIV. It is critical to study physical deficits in this population, as they can have an impact on mortality, falls risk, and health-related quality of life.

Objectives: In this critical review, we explore which factors contribute to physical impairments, report common physical impairments and activity limitations, describe physical performance measures, and provide recommendations for rehabilitation professionals for exercise prescription among PLWH.

Methods: Using Embase, MEDLINE, and CINAHL, we identified relevant studies by searching databases for terms related to physical function among PLWH. We also hand-searched reference lists for additional studies.

Results: Among PLWH, inflammation, HIV severity markers (CD4+ count and viral load), comorbidities, and oxidative stress are contributing factors to physical impairments and activity limitations. Gait, static and dynamic balance, aerobic capacity, diminished muscle strength and mass, and frailty are common and can have a negative impact on fall risk and functional performance in this population. Some physical performance measures from the limited available literature can be used for screening and assessment, including the Short Physical Performance Battery, Six-Minute Walk Test, 5-times sit-to-stand test, Community Mobility and Balance Scale, and gait speed tests. The Berg Balance Scale is not recommended for use with PLWH as it is susceptible to ceiling effects.

Conclusions: Physical impairments are common among PLWH. Aerobic exercise, resistance training, and balance exercise appear to benefit PLWH. Future work should investigate which outcome measures should be used in clinical practice to measure physical performance. Rehabilitation professionals should identify PLWH who are at risk of developing physical impairments using available physical performance measures.

204

Frailty Profiles of People Living with HIV; Beyond a Basic Classification

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Background: People ageing with HIV now face both HIV- and age-related health challenges with frailty being one of these concerns. Fried's Frailty Phenotype (FFP) is the predominant way of defining frailty based on meeting 3/5 criteria: weight loss, slow gait speed, week grip strength, exhaustion, and low physical activity. The pattern among these criteria may suggest different frailty phenotypes with potentially different causes and therefore different treatment approaches
Objectives: The purpose is to identify whether different frailty profiles emerge from five criteria of FFP and factors associated with emergent profiles.

Methods: Positive Brain Health Now cohort (n=856) was the data source. Item patterns of FFP were analyzed using latent class analysis. The main outcome was frailty profiles derived from self-report items were matching the original 5 criteria: BMI<21, exhaustion, low physical activity, limitation in walking several blocks and in lifting and carrying. The effects of explanatory variables, sex, pain, numbness, mood, CRP, CD4-count, and co-morbidities were estimated using multinominal regression yielding odds ratios (OR) and 95% confidence intervals.

Results: Five profiles emerged: (A) low physical activity (62%), (B)-fatigue (14%), (C) arm/not leg weakness (11%), (D) arm and leg weakness (5%); and (E) global frailty (8%). People in profiles (C,D,E), 24%, would be classified as frail (□3 items). I
frailty profiles (C,D,E) were explained by: pain (OR-range:6.1-10.8), numbness (OR-range:3.0-6.2), anxiety/depression (OR-range:3.0-3.3), arthritis (OR-range:2.3-4.1), and thyroid (OR-range:2.7-6.7).

Conclusion: People meet frailty criteria through different impairment profiles. Research data cannot determine whether the person is frail or whether their co-morbidities and impairments are the reasons for meeting the criteria to determine frailty. Frailty is considered something that has to been seen to be believed and a simple classification method may not be sufficient to quantify frailty for research purposes.

215

Implementation of clinical algorithms for take-home Naloxone and Buprenorphine/Naloxone in emergency rooms: SuboxED project evaluation

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Background: Deaths attributable to drug abuse are on the rise across Canada with more than 17,602 opioid-related deaths in 2020. Dispensing take-home naloxone (THN) and initiating opioid agonist treatment (OAT) can help prevent overdose, including programs for ED patients who are at risk for opioid overdose (ROO). In 2018, a multidisciplinary group of clinical experts set goals to implement a clinical algorithm for dispensing THN and prescribing buprenorphine/naloxone (B/n) for at ROO patients in 3 Québec EDs: SuboxED project.

Methods: This project had two phases i) implementation process and ii) evaluation process. The first phase named an expert group, identified 3 EDs, OAT, and pharmacy partnerships, and developed training tools and the ED algorithm. In phase 2, we performed a retrospective review of ED electronic medical records flagged as at ROO. The implementation process was from April 1, 2018 to April 30, 2019, and the evaluation, from May 1 to December 31, 2019. We also administered satisfaction surveys to medical teams and patients.

Results: In phase 1, the expert group trained over 328 ED staff. In phase 2877 (36.2%) patient records were included in the analysis. Of these, 62% had a confirmed diagnostic of opioid use disorder (OUD), and 70.8% met eligibility criteria for naloxone prescriptions. However, only 7.7% were given a prescription or THN in the ED, and 12.4% were initiated on B/n in the ED/the community after their visit. Seven patients and 125 health care providers from EDs, clinics, and retail pharmacies completed the survey.

Conclusion: The SuboxED project demonstrated the feasibility of implementing a clinical algorithm for dispensing THN and initiating B/n in ED, and identified the challenges. In addition to advocating for free access to THN in EDs, scaling up the uptake of the algorithm in EDs is the next challenge.

Buprenorphine/naloxone, take-home naloxone, implementation, overdose

89

Surgical Site Infections & Antibiotic Regimens in HIV-Positive Patients After Orthopaedic Surgery: A Systematic Review

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Objective: Orthopaedic surgery is essential to populations worldwide. Due to reduced CD4 counts, HIV+ patients may be at an increased risk of infection by perioperative pathogens. However, the risk of surgical site infection (SSI), and the effect of an extended antibiotic course on reducing postoperative infections in this population, remains unclear. Therefore, we systematically reviewed the literature in order to describe the influence of HIV status on the risk of developing SSIs after orthopaedic surgery, and to determine if such risk is altered by an antibiotic course.

Methods: Searches were conducted in five different databases. Articles that included HIV+ patients who underwent clean implant orthopaedic surgery, and provided a description of clinical outcomes, were eligible. The following data was extracted: patient sex, age, HIV status (+/-), type of orthopaedic procedure, follow-up period, presence of postoperative SSIs, and type of antibiotic course.

Results: Searches generated 1,440 articles, with 22 of those articles being eligible for review. There were 2,616 patients included, 78.9% of whom were male. Mean patient age was 39.4 years (SD = 5.9). Prior to surgery, 23.9% of patients were HIV+. Knee and hip arthroplasty were the most common procedures, and the mean follow-up period was 51.2 months (SD = 41.0). 14.5% of HIV+ patients and 7.8% of HIV- patients developed postoperative SSIs. The most frequent antibiotic course was a second- or third-generation cephalosporin regimen dosed once preoperatively and three times postoperatively.

Conclusion: HIV-positivity has been shown to increase the risk of SSI after clean implant orthopaedic surgery. Unfortunately, the effect of a prolonged antibiotic course on reducing infection risk is inconclusive. Our findings emphasize the need for subsequent studies to analyze infection rates based on CD4 counts and to compare antibiotic regimens for the purpose of developing safe orthopaedic surgical protocols for HIV patients.

15

Analysis of raltegravir plasma concentrations during pregnancy: impacts on the viral control of pregnant women living with HIV

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Background: Limited data is available concerning the impact of pregnancy on raltegravir (RAL) plasma concentrations. Furthermore, the relevance of therapeutic drug monitoring (TDM) for pregnant women is not demonstrated. This study aims to describe RAL minimum concentrations (Cmin). during pregnancy and their clinical significance, and to review the impact of RAL TDM during pregnancy on the management of HIV care.

Methods: In the prospective cohort of the Mother and Children's Infectious Diseases Center (Quebec, Canada), pregnant women living with HIV who used RAL at any time during their pregnancy between January 2011 and August 2020 were selected. RAL Cmin were assessed by liquid chromatography / tandem mass spectrometry. Undetectable viral load was set to < 50 HIV RNA copies/mL.

Results: We analyzed 76 pregnancies of which 47 underwent TDM. In this subgroup, we observed a significant difference in the distribution of RAL Cmin between the women with a detectable or undetectable viral load (p=0.025). A new RAL Cmin target of 0.032 mg/L showed the best area under the curve for undetectable viral load (specificity: 81%, sensitivity: 75 %, AUC: 0.819, p=0.037). No significant differences were observed between Cmin at each trimester or compared with a non-pregnant state. When comparing pregnancies with and without TDM, there was no statistical difference in the rate of viral suppression during pregnancy nor with the prescription of a prophylaxis antiretroviral triple therapy in newborns.

Conclusions: The RAL Cmin target of 0.032 mg/L should be confirmed. The impact of TDM monitoring could not be demonstrated.

162

Safety and Effectiveness of Tenofovir Alafenamide (TAF)-Containing Antiretroviral Therapy (ART) in Women Living with HIV

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Background: Tenofovir disoproxil fumarate (TDF) is a commonly used component of ART for the treatment of HIV. However, TDF has been associated with nephrotoxicity and reduction in bone mineral density (BMD). Tenofovir alafenamide (TAF) is a newer formulation with proposed benefit of fewer adverse effects (ADEs). Although TAF has been extensively studied, less than 20% of included participants are women. The primary objective of this study is to describe the proportion of women experiencing ADEs from TAF. Secondary objectives include: to describe changes in renal function, liver enzymes, lipid profile, weight, CD4+ cell count, BMD and virologic suppression before and after starting TAF, and describe the frequency of monitoring for ADEs and effectiveness following initiation of TAF.

Methods: Retrospective cohort chart review of HIV positive women initiated on TAF-containing regimens prior to August 31st, 2019 at the British Columbia's Women's Hospital Oak Tree Clinic. Inclusion criteria include those who received a TAF regimen for at least 30 days and patient reported adherence of ≥ 80%.

Results: A total of 35 women were included. ADEs were reported in 63% of patients, with majority defined as mild in severity. Overall mean (SD) change in weight was 1.4 ± 4.2 kg, with weight gain greater than 3% within the first year of therapy occurring in 9 (26%) patients. No clinically significant changes in laboratory values were observed. Median (IQR) change in T/Z-score from baseline was 0.6 ± 0.5 for lumbar spine, 0.3 ± 0.4 for femur, and 0 ± 0.1 for femoral neck. Virologic suppression was maintained in 95% of patients.

Conclusion: In this cohort of women TAF was well tolerated and effective. No clinically significant changes in renal function, liver enzymes, lipid profile or BMD was observed. Risk factors for weight gain within the first year of therapy may warrant further investigations.

250

Exploring Placenta Mitochondrial DNA Mutation Burden and Pregnancy Risk Factors in Women with HIV: Preliminary Findings from a Molecular Barcoding Approach

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Background: Both HIV and ART affect mitochondrial DNA (mtDNA) which may contribute to high rates of preterm birth (PTB) among women living with HIV (WLWH). The causes of PTB remain poorly understood, but hypoxia, oxidative stress, and impaired placenta mitochondrial function are believed to play a role. Factors such as maternal smoking and older age, both associated with risk of PTB, have also been associated with increased mtDNA mutation burden in blood cells. The objective of this pilot study was to explore associations between placenta mtDNA mutation burden and maternal HIV status, smoking, age, or PTB.

Methods: Placenta tissue specimens were obtained from two cohorts of pregnant women: Children & Women AntiRetroviral therapy and Markers of Aging (CARMA-PREG), and the Pregnancy Study. Specimens selected included 37 WLWH (13/37 PTB) and 27 HIV-negative controls (10/27 PTB). A 264bp region of the mitochondrial D-loop was sequenced using molecular barcoding to detect rare substitutions; mtDNA mutation burden was expressed as substitutions per 10kb and analyzed using Mann Whitney or Spearman's correlation test.

Results: Univariately, increased placenta mtDNA mutation burden was associated with older maternal age and with smoking throughout pregnancy, although the latter was mitigated in women who quit smoking during pregnancy. No significant associations was detected with HIV status or PTB, however, a signal toward higher placenta mtDNA mutation burden among WLWH emerged in a sub-analysis restricted to the 252/264 fully conserved positions of the 64 mtDNA sequences.

Conclusions: This study suggests that older age, smoking, and HIV may be associated with increased placenta mtDNA mutations. Although all three factors are associated with increased risk of PTB, we failed to detect an association between PTB and mtDNA mutations. A larger study is needed to confirm independent associations, including with other pregnancy complications, and to investigate possible associations with ART.

92

Goal Setting and Achievement in a Community-Based Exercise (CBE) Intervention Study among Adults Living with HIV

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Objective: Goal setting is an important component of self-management interventions such as exercise among people living with chronic disease. Our aim was to describe goal setting and achievement among adults living with HIV engaged in a community-based exercise (CBE) intervention.

Methods: We administered the Goal Attainment Scale (GAS) to participants living with HIV pre-CBE intervention (month 0), post-CBE intervention (month 6) and follow-up (month 14). The CBE intervention included exercise 3 times/week with weekly supervised coaching (Intervention), followed by thrice-weekly independent exercise (Follow-Up). Goals were established in collaboration with the research coordinator (months 0 and 6) and shared among participants and coaches, were independent from the CBE intervention and considered an exploratory outcome of our larger study. We conducted a content analysis to describe the type of goals set at baseline (month 0) and post-CBE intervention (month 6). We described the extent of goal achievement (frequency;%) at the end of intervention (month 6) and end of follow-up (month 14).

Results: Of 82 participants who completed the baseline GAS, 60 (75%) completed it post-intervention and 46 (56%) at end of follow-up (similar to participant retention in the CBE study). Of 275 goals set at baseline, 133 (48%) were achieved at month 6; most (76%) were physical goals (common physical goals achieved: improve balance, endurance, strength/muscle capacity, incorporate exercise into routine (# achieved/# articulated ≥50%). Of 162 goals set at month 6, 80 (49%) were achieved at month 14; most (74%) were physical goals similar to baseline (common physical goals achieved: improve overall fitness, endurance, flexibility, body tone/physique, and balance, activity-specific goals, incorporate exercise into routine (#achieved/# articulated ≥50%).

Conclusion: Collaborative goal setting can be used as a motivating factor when implementing self-management interventions and offer a potential outcome for evaluating the impact of exercise interventions for adults living with HIV.

241

Kaposi sarcoma in ART-treated people living with HIV: A new form to be compared with classical Kaposi in HIV-uninfected individuals

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Background: The incidence of HHV8-induced Kaposi sarcoma (KS) in people living with HIV (PLWH) has dramatically decreased with antiretroviral treatments (ART). However, reemergence of KS in ART-treated PLWH with restored CD4 T-cell count and sustained HIV control is reported, raising concerns on HHV-8 pathogenesis and optimal management of these patients.

Method: We performed a pilot study including ART-treated PLWH (KS ART HIV+) and uninfected people (KS HIV-) with KS. We assessed clinical characteristics, CD4 and CD8 counts. In plasma and PBMCs, viral loads of HHV-8, CMV and EBV were quantified by digital droplet PCR.

Results: 19 patients with KS have been recruited, including 11 KS ART HIV+ with undetectable HIV viremia and 8 KS HIV-. Cases of KS ART HIV+ were all men who have sex with men (MSM), whereas 7/8 KS HIV- were male including 3 MSM. KS ART HIV+ were younger than KS HIV- (52 years vs 79, p=0.0005). Despite similar CD4 T-cell count in the two groups (579 vs 472 cells/µL, p=0.30), KS ART HIV+ had a higher CD8 T-cell count (608 vs 374 cells/µL, p=0.007) and lower CD4/CD8 ratio (0.7 vs 1.8, p=0.03). HHV-8 DNA in PBMCs was detected in none (0/9) of KS ART HIV+ while in 3/7 KS HIV-. In contrast, EBV and CMV DNA was detected at similar levels in PBMCs of all KS patients, HIV+ or HIV-.

Conclusion: ART-treated PLWH with KS exhibited similar CD4 T-cell counts but higher CD8 T-cell counts and younger age compared to HIV-uninfected KS patients. Irrespectively of HIV infection, other herpesviruses EBV and CMV DNA was detected in PBMCs of all KS participants. We are now assessing the influence of aging, inflammation, microbial translocation as well as host and viral factors in KS pathogenesis. Such insights will help reducing KS-induced stigma and developing preventive and therapeutical strategies.

84

Pharmacist collaboration: clinic-based and community-based pharmacists in HIV care in Canada

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Background: Pharmacists contribute to HIV patient care in different settings. The purpose of this study is to describe the roles of clinic- and community-based pharmacists in HIV care in Canada, and to understand how pharmacists within these settings can effectively collaborate to improve pharmaceutical care.

Methods: A mixed-methods approach was utilized. A cross-sectional survey was distributed electronically to the Canadian HIV and Viral Hepatitis Pharmacists Network in September 2020. A convenience sample of interested respondents was selected for semi-structured interviews. Survey data were analyzed descriptively and triangulated with interview transcript data, which were analyzed independently by two researchers using an inductive approach.

Results: Thirty-two pharmacists from cities across British Columbia, Alberta, Saskatchewan, Ontario, and Quebec responded to the survey and 3 pharmacists were interviewed. Survey respondents were primarily clinic-based pharmacists (75%) or community pharmacists (12.5%); interviewed pharmacists were clinic-based. Two thirds of survey respondents reported both clinic- and community-based pharmacist involvement in caring for HIV patients, but 62% would like community pharmacists to increase capacity for HIV care. Clinic-based pharmacists described a desire for greater sharing of clinical tasks such as medication counselling in order to increase clinic-based pharmacists' capacity to focus more on complex clinical cases. While community pharmacists can play important roles in adherence and safety monitoring, the level of collaboration between HIV clinics and community pharmacies varies. For community pharmacists to be better utilized in HIV care, they require increased HIV knowledge, access to more clinical information about patients, and improved communication with clinics.

Conclusions: Most HIV clinic-based pharmacists regularly collaborate with community pharmacists to deliver care, but barriers limit the degree to which collaboration occurs. HIV training for community pharmacists and a communication system that enables information sharing across healthcare settings could enhance pharmacist collaboration in HIV care, but more input from community pharmacists is needed.

98

Pregnancy Outcomes Among Women Living with HIV who Received the Quadrivalent HPV Vaccine During Pregnancy

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Objectives: To assess pregnancy outcomes among women living with HIV (WLWH) vaccinated against HPV during pregnancy or near conception (within three months of last menstrual period).

Methods: This is a sub-analysis from a multi-centre Canadian study of qHPV vaccination in WLWH. Participants were not pregnant at the time of study enrolment (by urine pregnancy test) and were willing to avoid pregnancy for the vaccination phase. If conception did occur prior to or shortly after a vaccine dose was administered, pregnancy and infant outcomes were documented.

Results: 353 WLWH received ≥1 dose of qHPV vaccine. At baseline, median age was 36 years (IQR: 27-43), median CD4 count was 523 cells/mm3 (IQR: 384-710), median CD4 nadir was 242 cells/mm3 (IQR: 123-367), and 67% had a suppressed HIV viral load (<50 copies/mL). Seventeen WLWH received a dose of qHPV vaccine while pregnant (n=8, all within the first month) or within 3 months of conception (n=9). Among the 17 pregnancies, there were 9 live births (53%; 4 among women vaccinated while pregnant and 5 among women vaccinated near conception), 7 therapeutic abortions (41%; 3 among women vaccinated while pregnant and 4 among women vaccinated near conception), 1 spontaneous abortion in a woman vaccinated while pregnant, and 0 stillbirths. Among the 9 live born infants, median gestational age at delivery was 39.4 weeks (IQR: 38.6-40.1), median birth weight was 2830g (IQR: 2698-3755), and median Apgar scores at first and second assessment were both 9.

Conclusions: Although the number of pregnancies among WLWH vaccinated during/near pregnancy was too low to compare their specific pregnancy outcomes with those of controls not vaccinated during/near pregnancy, adverse pregnancy outcomes were uncommon among qHPV-vaccinated WLWH in our cohort. These findings are consistent with reproductive safety data for qHPV vaccines in cohorts of women not living with HIV.

12

Islatravir selects for HIV-1 variants in MT4-GFP cells that profoundly reduce replicative capacity in peripheral blood mononuclear cells

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Background: Islatravir (ISL; MK-8591) is a nucleoside reverse transcriptase translocation inhibitor (NRTTI) with multiple mechanisms of action. ISL has potent activity against nucleos(t)ide reverse transcriptase inhibitor (NRTI) resistance-associated variants and inhibitory quotients (IQs) that suggest it will have a high barrier to resistance in the clinic. We conducted studies to increase understanding of resistance pathways that alter susceptibility to ISL.

Materials and methods: Viral resistance selection studies were conducted with HIV-1 subtype B in MT4-green fluorescent protein (GFP) cells and with subtypes A and C in MT4-GFP/CCR5 cells with escalating ISL concentrations. Antiviral activity of ISL on variants bearing emergent substitutions, or NRTI resistance-associated substitutions, was assessed in MT4-GFP cells and/or PBMCs. Replication capacity was examined for select variants.

Results: In subtype A, B, and C viruses, ISL selected for M184I and M184V mutations; however, these mutations conferred modest impacts on ISL antiviral activity (6.2- and 6.8-fold potency (IC50) reductions, respectively). In subtype B virus, a rare A114S variant (observed in a single replicate experiment at passage 38) was detected. Phenotypic analysis showed A114S conferred a marginal potency loss (≤2-fold) to ISL while variants containing A114S+M184V conferred a >24-fold potency loss to ISL. Variants containing A114S+M184V had profoundly reduced replicative capacity consistent with being rarely observed in the clinic. In contrast to the decreased susceptibility to ISL, A114S increased susceptibility to NRTIs, tenofovir disoproxil fumarate, zidovudine, lamivudine, and emtricitabine, by 1.6- to 14.3-fold in PBMCs. Combinations of A114S and thymidine analog mutations enhanced susceptibility to NRTIs but not ISL suggesting distinct inhibitory mechanisms on reverse transcription.

Conclusions: Variants selected by ISL selective pressure in vitro exhibit low replicative capacity and confer modest foldshifts on antiviral activity of ISL. The high potency of ISL coupled with its high IQs, continue to support a high barrier to the development of ISL resistance.

73

Susceptibility to Bictegravir and Cabotegravir and Integration site preferences of HIV-1 non-B subtype Viruses from patients failing Raltegravir in Uganda

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Background: Second generation integrase strand transfer inhibitor (INSTI) cabotegravir is in late clinical trial as oral and long injectable, and bictegravir (BIC) is becoming accessible in settings with high HIV-1 non-B subtype viruses. Data on impact of INSTIs drug resistance mutations (DRMs) on integration site preference and susceptibility to BIC and CAB remains very scarce especially in HIV-1 non-B subtypes.

Methods: Phenotypic assays on HIV-1 integrase recombinant subtype A and D viruses from 8 patients failing RAL-based third-line in Uganda was done in TZM-bl cells. HIV-1 integration capacity into human genome was assessed in MT4 cells. Integration site profiles were analyzed from total genomic DNA of antiretroviral therapy naïve (n=30), raltegravir failing (n=30) and protease inhibitor failing patients (n=30) using Illumina MiSeq sequencing.

Results: HIV-1 integrase recombinant viruses harboring single N155H or Y143R/S mutations or in combination with secondary INSTIs mutations were susceptible to both BIC and CAB. However, multiple primary INSTIs DRMs in form of E138A/G140A/G163R/Q148R, and E138K/G140A/S147G/Q148K mutations led to increased fold-change in EC50 to both CAB (FC, 429->1000) and BIC (FC, 60->100). Reduced susceptibility in presence of multiple primary INSTIs DRMs was significantly high with CAB compared to BIC ($P < 0.0023$). Contrary to ART naïve, viruses carrying INSTIs DRMs significantly integrated into lamina associated domains ($P < 0.0001$) and oncogenes ($P < 0.05$). All viruses had impaired integration capacity, (<50%) relative to the wild type.

Conclusions: Single N155H or Y143S/R or in combination with secondary mutations, remain susceptible to both BIC and CAB, however, multiple primary INSTIs DRMs leads to increased resistance to CAB and BIC. Though not currently indicated, BIC offers alternative option to patients with single primary and/ or in combination with secondary mutations. INSTIs DRMs may encourage formation of latent reservoirs and malignancies in patients failing RAL with resistance.

150

Favorable Drug Resistance Profile of Doravirine and Islatravir

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Introduction: The newer generation of non-nucleoside reverse transcriptase inhibitors (NNRTIs), doravirine and rilpivirine, demonstrate high potency and can overcome resistance caused by K103N, Y181C and G190A point mutations, Phase 2 trials showed that the doravirine, combined with islatravir, the first nucleoside reverse transcriptase translocation inhibitor, maintained viral suppression through 96 weeks. Here, we performed in vitro drug selections to compare the drug resistance profiles of doravirine, alone & paired with lamivudine (3TC) or islatravir.

Methods: Subtype B (n=4) and non-B subtype (n=3) clinical isolates were passaged in cord blood mononuclear cells with progressively increasing concentrations of doravirine, doravirine + islatravir, doravirine + 3TC, rilpivirine, rilpivirine + islatravir, and rilpivirine + 3TC. Genotypic analysis monitored the acquisition and accumulation of drug resistance mutations at weeks 8 and 24 following selective drug pressure. Cell-based phenotypic assays assessed levels of cross-resistance conferred by acquired resistance mutations.

Results: Doravirine pressure resulted in the acquisition of V108I (6/7) and V106A/I/M (5/7) mutations at weeks 8, followed by F227L (4/7), Y318F (4/7), M230L (2/7) and L234I (2/7) by weeks 24. In contrast, rilpivirine favoured the appearance of E138K (5/7), L100I (3/7) and.M230L (1/7). Doravirine-resistant variants retained sensitivity to rilpivirine and etravirine, whereas rilpivirine-resistant variants showed intermediate resistance (12-152-fold) to doravirine. There was a delay and diminution in the emergence of resistance when doravirine was combined with islatravir or 3TC. At 24 weeks, the V108I mutation (9/15) prevailed with fewer or no other changes. There was a lesser delay in emergent resistance to rilpivirine when combined islatravir or lamivudine selections. The M184I/V mutation, conferring islatravir and lamivudine resistance, rarely occurred in dual (2/28) selections.

Conclusion: Doravirine showed a more robust resistance profile compared to other NNRTIs. The high potency and long intracellular half-life of islatravir, provide the opportunity for long-acting and low dosing treatment options.

166

Evaluation of Combinations of Clinical Integrase Mutations on Integrase Strand Transfer Inhibitor Resistance

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Background: While major integrase strand transfer inhibitor (INSTI) resistance mutations have been identified, the effect of mutation combinations is less clear. We identified a clinical HIV sequence with four major integrase resistance mutations, and characterized in vitro INSTI phenotypic susceptibility of all combinations thereof to deconstruct their individual and combined effects.

Methods: Routine clinical testing identified an integrase sequence harboring T97A, E138K, G140S and Q148H. We constructed chimeric NL4-3 viruses harboring i) all possible combinations of 0- to 4-mutations in the autologous integrase backbone, and ii) NL4-3 with all four mutations. Chimeric viruses were grown in reporter CD4+ T-cells in the presence of 0.01-1,000nM raltegravir (RAL), elvitegravir (EVG), dolutegravir (DTG), cabotegravir (CAB), and bictegravir (BIC), where infection was measured by imaging cytometry.

Results: Viruses engineered with Q148H without G140S either failed to propagate, or propagated only after in vitro mutation. In the autologous viral backbone, T97A, E138K, or G140S alone conferred 2.4 to 15.4-fold decreased susceptibility to EVG but not to other INSTI. Two-mutation combinations conferred low to moderate resistance, except G140S/Q148H which eliminated RAL and EVG activity and conferred 8.3-, 50.9-, and 3.1-fold reduced susceptibility to DTG, CAB, and BIC respectively. Addition of E138K to G140S/Q148H conferred 12.1-, 98.6- and 4.6-fold reduced susceptibility to DTG, CAB, and BIC respectively, while addition of T97A to G140S/Q148H reduced susceptibility by >100, >100 and 47.7-fold. The T97A/E138K/G140S/Q148H clinical sequence displayed >100-fold reduced susceptibility to all INSTIs. The quadruple NL4.3 mutant displayed >100-fold reduced susceptibility to RAL, EVG and CAB but only 66.2-, and 8.2-fold less to DTG, and BIC respectively, while the clinical revertant retained 2.8-fold decreased susceptibility to EVG. Measured EC50s correlated strongly with Stanford HIVdB resistance scores (Spearman $r>0.87$; $p<0.0001$ for all INSTIs).

Conclusion: High-level resistance to DTG, CAB and BIC requires multiple integrase substitutions including compensatory mutations.

83

Neurocognitive Outcomes Not Associated with Prior Syphilis or Number of Episodes of Syphilis in HIV+ Adults in Care in Ontario

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Background: We hypothesized that prior syphilis would be associated with worse neurocognitive outcomes among HIV+ adults.

Methods: We performed a retrospective analysis of adults enrolled in the OHTN Cohort Study between 2008-2017. Neurocognitive measures included: 1) MOS-HIV 4-item scale; 2) average T-score (ATS) using complex attention, speed of processing, and learning/memory data; 3) global deficit score (GDS) dichotomized into impaired/unimpaired. Prior syphilis was determined through chart review/lab data while number of episodes used lab data. We compared the most recent MOS-HIV and ATS among those with/without syphilis using Wilcoxon rank-sum tests, and the proportion impaired on GDS using Chi-Square/Fisher tests. Multivariable models were adjusted for age, education, race, income, years of HIV, nadir and most recent CD4 count, most recent viral load, methamphetamine use, depression, and number of prior neurocognitive tests performed.

Results: Of 1434 participants, 228 had prior syphilis. Median age was 47(IQR: 37,54), 76.4% were male, median CD4 count was 517.5 (IQR: 360,678) cells/mm3, and 80.2% had HIV viral load <50 copies/mL. Median lab-confirmed episodes in the syphilis group was 1 (IQR: 0,1). There was no significant difference in median MOS-HIV (85 vs. 80, p=0.58), median ATS (45.8 vs. 45.8, p=0.87), or the proportion with neurocognitive impairment on GDS (53.0% vs. 51.9%, p=0.87), between syphilis and non-syphilis groups. Multivariable models found no significant relationship between syphilis or the number of episodes of syphilis and the neurocognitive outcomes (Table).

Conclusion: Among HIV+ adults in care, there was no association between prior syphilis/number of episodes of syphilis and neurocognitive outcomes.

102

Bridging health inequities for precariously-insured PLHIV through innovative multidisciplinary clinical/community partnerships

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Background: People living with HIV who have precarious or no health care coverage face major barriers in accessing health care, treatment and support. This group makes up a significant proportion of the 10-10-10% gaps in the HIV care engagement cascade. In response, a coalition of 10 health and community agencies in the Greater Toronto collaborated to develop the Blue Door Clinic to offer timely primary care, access to treatment, social supports, and linkage to long-term stable health services.

Method: Launched in August 2019, the Blue Door Clinic operates a bimonthly half-day clinic in downtown Toronto, staffed with physicians, nurses, case managers and peer navigators all donated in-kind from partner agencies. Our clinicians provide clients with primary care, access to HIV treatment, immunizations, and monitoring tests. Our case managers and peer navigators connect them to needed legal, social and mental health supports. Since inception, the Blue Door Clinic has served 91 clients. This abstract will report on client service data from our first year of operation.

Results: Our clients include: 38 (42%) people on temporary work or visitor permits, 26 (28.5%) with pending immigration processes; 18 (20%) international students, and 9 (10%) with lapsed immigration status. Of those we served, 26 (29%) were newly diagnosed with HIV; 9 (10%) presented with advanced HIV disease with AIDS-related complications, and the rest were people with known HIV who faced imminent risks of treatment disruptions.
To date, 39 (43%) of our clients were successfully referred to other health services and 56 (61%) were connected to additional community support services.

Conclusion: The Blue Door Clinic successfully bridged a critical gap in the HIV care continuum. Results from our service evaluation research study underway will provide further insights on its long-term health impact and the replicability and sustainability of its model to benefit other marginalized populations.

113

Characteristics of newly diagnosed HIV positive individuals between 1983 and 2019: a clinic-based study in Montréal (Clinique médicale l'Actuel)

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Background: Characterizing new HIV diagnoses can help inform public health responses. Using almost four decades of data, this study describes the changing profiles of newly HIV diagnosed individuals attending a large sexual health clinic in Montréal, Canada.

Methods: HIV diagnosis data from participants of the l'Actuel's clinical cohort was used to assess the distribution of HIV exposure categories by gender and year of diagnosis. Time trends in mean age and CD4 count at diagnosis were assessed.

Results: We analysed 3,457 patients diagnosed between 1983-2019. Over this period, mean age at diagnosis increased from <30 years to mid-30s. Overall, the mean CD4 count at diagnosis was estimated at 480 cells/µL and remained stable over time. Although men who have sex with men (MSM) consistently accounted for the highest proportion of new diagnoses (77%), their proportion decreased since 2013. There was also a concomitant decrease in the proportion of people who inject drugs, and an important increase in the proportion of patients from HIV-endemic countries (24% in 2019), especially among women (Figure). Over 2015-2019, 63% of women diagnosed were born in a HIV-endemic country. Those from endemic countries were characterized by higher proportions of heterosexuals (89% vs 17%) and of women (52% vs 7%), and lower CD4 count at diagnosis (370 vs 480 cells/µL).

Conclusion: In absolute numbers, MSM continue to account for the largest exposure category. Patients from HIV-endemic countries constitute an increasing proportion of new diagnoses. Tailoring HIV testing strategies and other prevention interventions to these individuals is warranted.

233

Service Provider HIV Self-Testing National Survey Results: Knowledge, Access, Usability, Supports, and Barriers

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Introduction: With the approval of Canada's first HIV self-test in November 2020, there is an urgent need to identify the degree to which HIV self-testing (HIVST) can be supported by front-line agencies to reach key populations. This survey examined service provider knowledge of HIVST, their perspectives on access, usability, supports and barriers for HIVST in Canada, and the potential impact on HIV services in the context of COVID-19.

Methods: REACH Nexus conducted an anonymous national survey of individuals involved in frontline work for HIV support, treatment and care from all 10 provinces (n = 308) from August 6, 2020 to September 1, 2020. The survey was distributed through email to those who registered for a series of webinars on self-testing hosted by REACH Nexus.

Results: 32% of respondents thought they were well informed about HIV self-testing, however reporting varied by province. Survey respondents believed ordering through online (37%) and mobile platforms (26%) was the preferred method of accessing HIVST kits. Approximately 60% of the respondents thought that clients would be comfortable connecting with front-line workers or peers through a telehealth platform. Most thought that HIVST kits should be offered alongside linkage to counselling (98%), or prevention services such as pre-exposure prophylaxis (PrEP) (94%). A large majority (86%) of survey respondents indicated that HIVST should cost under $20.00 CAD, and 86% indicated that governments should pay for HIVST. Survey respondents believed that COVID-19 significantly reduced uptake in HIV testing services, PrEP, and HIV counselling.

Conclusions: These findings highlight the need for use of technology and telehealth-based solutions to reach key populations, and for HIV self-testing to be affordable and/or accessible through government subsidies or insurance. Supports are needed to ensure front-line agency and organizational readiness for HIV self-testing in Canada.

31

Estimation of the number of gay, bisexual, and other men who have sex with men in Ontario to enable more precise population-specific metrics of the HIV epidemic and targeted interventions

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Background: Estimating the number of gay, bisexual, and other men who have sex with men (GBMSM) in Ontario and sub-provincial regions enables the estimation of GBMSM-specific HIV metrics, including prevalence, incidence, and testing rates.

Methods: We estimated the number of GBMSM in Ontario beginning with a base estimate of the number of males aged ≥15 who identified as “homosexual” or “bisexual” in the Canadian Community Health Survey (CCHS 2017-2019 [combined yearly cross-sectional data]). As this was a known undercount of GBMSM, two adjusted estimates were created. The first estimate was defined by identity and adjusted for non-disclosure of sexual orientation (using SexNow 2019 cross-sectional survey data) and men who did not identify as gay or bisexual who reported anal sex with another man in the past twelve/six months (CCHS/SexNow). The second estimate was defined by sexual behaviour and additionally restricted gay- or bisexual-identifying men (GBM) to those who reported anal sex with another man in the past twelve/six months (CCHS/SexNow).

Results: Among GBM, 84.1% reported themselves likely to disclose their sexual orientation on a Statistics Canada survey (SexNow), and 57.3% (CCHS) and 77.3% (SexNow) reported anal sex with another man in the past twelve and six months, respectively. Men who did not identify as gay or bisexual comprised 5.9%-9.4% of the total GBMSM population, depending on the population definition (identity or behaviour). The first identity-defined estimate of the number of GBMSM was 217,885 for Ontario and 72,539 for Toronto, and the second behaviour-defined estimate was 150,298 for Ontario.

Conclusions: These estimates provide an evidence-informed measure of the size of the GBMSM population and improve our understanding of the size of the target population for HIV prevention activities. This work is foundational to produce population-specific metrics including prevalence, incidence, and testing rates which will better describe the HIV epidemic among GBMSM.

38

HIV-Related Healthcare Utilization among People Living with HIV in British Columbia, Canada

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Background: Resource allocation and planning among people living with HIV (PLWH) can be facilitated, in part, by population-based descriptions of HIV-related healthcare utilization. Using linkages of data housed at the British Columbia Centre for Excellence in HIV/AIDS (BC-CfE), the BC Centre for Disease Control (BCCDC), and the BC Ministry of Health, we describe HIV-related testing, outpatient physician visits, and hospitalizations in BC.

Methods: The Seek and Treat for Optimal Prevention (STOP) of HIV/AIDS Study is composed of population-based linkages between HIV-related clinical and treatment data from the BC-CfE, HIV testing data from the BCCDC, and provincial administrative health datasets. HIV-related physician visits (defined by ICD-9 and ICD-9-CM diagnostic codes, Medical Services Plan) and hospitalizations (ICD-9 and ICD-10-CA, Discharge Abstract Database) were identified between April 1-1996 and March 31-2017. Tabulations of HIV-related testing, outpatient physician visits, and hospitalizations are presented.

Results: At any point between April 1-1996 and March 31-2017, 47% (7,344 of the 15,599 PLWH in BC) had a positive HIV test result recorded at the BCCDC. Among the 7,344 people with a positive HIV test, 4,346 (59%) had a single positive test and 2,998 (41%) had one positive test and at least one prior negative test. Of the 15,599 PLWH, 86% of people had at least one HIV-related physician visit and 73% of all HIV-related visits were with general practitioners. Lastly, 58% of people had at least one HIV-related hospitalization over the period. Overall, the most responsible diagnosis for HIV-related hospitalizations was for the management of one (or more) manifestations of HIV followed by cellulitis then pneumonia.

Conclusion: Describing HIV-related healthcare utilization increases our understanding of the burden of HIV in BC. However, given the nature of secondary data, administrative coding may over- or under-estimate tabulations. Further descriptions of healthcare utilization, particularly over time, are needed among PLWH.

82

Treatment Trajectories for Psychosis among People Living with HIV

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Background: Antipsychotics, i.e. first generation (FGA) dopamine D2 antagonists or second-generation (SGA) dopamine D2 and serotonin 5HT-2 antagonists, are mainstays in treatment of psychotic disorders. Yet, treatment pathways among people living with HIV (PLWH) is not well understood. Our objective was to characterize treatment trajectories in a population-based cohort of PLWH with incident psychosis.

Methods: We utilized data from the Seek and Treat for Optimal Prevention of HIV/AIDS (STOP HIV/AIDS) cohort, identifying all PLWH (aged ≥19) between April 1996 and March 2017 in British Columbia. We assessed the uptake of antipsychotics between April 1998 and March 2017, including the proportion of individuals receiving first prescription from the time of psychosis diagnosis, and proportion of people who advanced to second prescription. Further, time to prescription was assessed.

Results: We identified 613 PLWH with incident psychosis, who were primarily male 446 (72.8%). Median age at psychosis diagnosis was 42 (Q1, Q3: 35, 49). A total of 486 (79.3%) received their first prescription, within a median of 21 days after diagnosis; the majority of whom were on quetiapine (n=157; 32.3%). Of these who received first prescription, 303 (62.3%) advanced to second prescription, a median of 217 days later; the majority were on risperidone (n=91; 30.0%). Table 1 describes prescription trajectory by regimen.

Conclusion: Nearly three-quarters of PLWH are dispensed antipsychotics shortly after their psychosis diagnosis, the majority of which are advanced to second prescription almost six months later indicating the need to explore retention in care and potential for treatment failures.

180

Improving Estimates of First-Time HIV Diagnoses in Ontario Through Modelling Missing Test History and Race/Ethnicity Data

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Background: Ontario's laboratory-based HIV surveillance utilizes laboratory record linkage and clinician reported test history to determine whether a person is retesting or learning their status for the first time. In 2017-18, 31% of first-time HIV diagnoses were missing data on race/ethnicity and 47% were missing data on test history. Accounting for missingness allows for more accurate reporting of first-time HIV diagnoses in Ontario.

Methods: We modelled average annual first-time HIV diagnoses in 2017-18 by accounting for the rate of out-of-province diagnoses and test history missingness by sex and race/ethnicity. Information from initial HIV test and follow-up clinician reporting for positive HIV cases was used to assess re-test vs. first-time diagnosis status based on completed test history. If no test history is indicated, a diagnosis could be inaccurately categorized as a "first-time" diagnosis. Missing race/ethnicity was modelled by applying the proportions of race/ethnicity by sex among known cases, assuming data missing at random. Missing test history was modelled by applying the proportions of previous positive test history by race/ethnicity, sex and year. Sensitivity analyses (range) included assuming 100% or 0% of diagnoses missing test history would have indicated a previous positive test.

Results: There were 649 (488-687) estimated average annual first-time HIV diagnoses in Ontario in 2017-18; 533 (410-557) among males and 115 (86-128) among females. White males accounted for the largest number of first-time HIV diagnoses-254 (188-262), followed by Black males-95 (70-103), Black females-62 (49-73), East/Southeast Asian males-60 (47-62), Latin American males-55 (45-59) and White females-35 (25-36). All other counts by sex and race/ethnicity each represented less than 5% of first-time HIV diagnoses.

Conclusions: For the first time in Ontario, we modelled a more accurate number of first-time HIV diagnoses by race/ethnicity which accounted for missing data. Understanding first-time HIV diagnoses by race/ethnicity and sex better informs targeted prevention programs.

118

Temporal Trends In Access To Hepatitis C Virus (HCV) Prevention And Care Among HIV-HCV Coinfected People Who Inject Drugs In Canada

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Background: We investigated temporal trends (2003-2019) in HCV treatment uptake and efficacy, injection behaviours, and access to harm reduction services among HIV-HCV coinfected people who inject drugs (PWID) in Canada to identify gaps that need to be addressed for reaching HCV elimination by 2030.

Methods: We used data from the Canadian Coinfection Cohort (N=2,004). We included 1,090 participants who injected at least once over 2003-2019. Trends were examined using three time periods based on HCV treatment guidelines: 2003-2010: interferon/ribavirin-based; 2011-2013: first-generation direct-acting antivirals (DAAs); 2014-2019: second-generation DAAs. The harm reduction services assessed include needle and syringe programs (NSP), opioid agonist therapy (OAT), and supervised injection sites (SIS), for which data were available from 2014 to 2019.

Results: Median age at cohort entry was 44 years (69% male; 33% Indigenous). HCV treatment uptake and efficacy increased substantially from 2003-2010 to 2014-2019 (Table). The frequency of cocaine injection decreased from 84% of visits (2003-2010) to 57% (2014-2019), and opioid injection increased from 50% to 60% over time. Reported needle/syringe sharing declined from 12% (2003-2010) to 5% (2014-2019). Paradoxically, reported NSP use also decreased, potentially reflecting fewer daily injections due to reduced cocaine use. OAT engagement among opioid users was low and 9% of participants accessed SIS over 2014-2019.

Conclusions: HCV treatment access and outcomes have improved among coinfected PWID. Yet, exposure to injection-related risks continues and is increasingly related to opioid use. Maximizing access to proven harm reduction strategies to prevent HCV re-infection and overdose, and ultimately achieve HCV elimination, is required.

153

Effect of Clinically Relevant Depressive Symptoms on Hepatitis C Virus (HCV) Treatment Initiation in the HIV-HCV Co-Infected Population in Canada

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Background: Psychiatric illness was a major barrier for HCV treatment during the interferon (IFN) era due to medication-related neuropsychiatric side effects. While direct acting antivirals (DAA) are better tolerated, patient-level barriers to treatment initiation persist. We assessed the effect of depressive symptoms on time to HCV treatment initiation among HIV-HCV co-infected persons during the IFN (2003-2010) and second-generation DAA eras (2013-2020).

Methods: We used data from a multicentre prospective cohort, the Canadian Co-infection Cohort and its associated food security sub-study. We developed marginal structural Cox proportional hazards models with inverse weighting for competing risks (death) to assess effect of predicted depressive symptoms on time to treatment initiation among HCV RNA+ participants. Depressive symptoms were predicted by a random forest classifier derived using the Center for Epidemiologic Studies Depression Scale-10. Exposure misclassification was addressed using predictive value-based record-level correction.

Results: We included 535 and 1,127 participants, from the IFN and DAA eras respectively, with 51% and 64% reporting depressive symptoms at baseline. Treatment initiation rates increased from 9 (95%CI:8-11) to 21 (95%CI:19-22) per 100 person-years. Results (Table 1) indicate lower treatment initiation among those with depressive symptoms compared to those without in the IFN era and higher initiation among those with depressive symptoms in the DAA era, with effect attenuation after misclassification correction.

Conclusions: Depression may no longer be a barrier to HCV treatment in the DAA era. The relatively higher rates of treatment initiation in patients with depressive symptoms suggest those previously unable to tolerate IFN are now accessing treatment.

170

Prevalence and Correlates of Mycoplasma Genitalium Infection Among Gay, Bisexual and Other Men Who Have Sex with Men (GBM) in Greater Montréal, Canada - Results from the Engage Study.

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Background: Mycoplasma genitalium (MG) infection causes persistent/recurrent urethritis and may contribute to HIV transmissibility. Screening is not routine; test availability is limited. Population-based prevalence data are lacking. We estimated MG prevalence and examined related correlates among GBM.

Methods: Using respondent-driven sampling (RDS), we recruited cisgender and transgender men, ≥16 years, sexually active, and residing in greater Montreal. Participants completed a computer-assisted self-interview and HIV/STI testing. Pharyngeal samples were collected by research nurses, urine and rectal samples by participants. Specimens collected at cohort study visits between 11/2018-11/2019 were analyzed using Allplex™ CT/NG/MG/TV Assay,Seegene Inc. Correlates of MG were identified using logistic regressions and Akaike information criteria (AIC) for model selection. All estimates are RDS-II-adjusted.

Results: Specimens from a total of 717 participants were analyzed. The RDS-adjusted prevalence (95% CI) of MG infection at rectal, urethral, pharyngeal, and at least one anatomical site was: 3.0 (1.5-4.5), 1.9 (0.7-3.1), 0.5 (0.2-0.9), 4.7 (2.9-6.6), respectively. The RDS-adjusted prevalence (95% CI) (at least one site) of Neisseria gonorrhoeae (NG), Chlamydia trachomatis (CT) and Trichomonas vaginalis (TV) infection were: 5.2 (3.3-7.2), 2.4 (0.6-4.2) and 0.5 (0.1-0.8), respectively. Correlates of MG infection are summarized (Table 1).

Conclusions: Prevalence of MG (at least one site) was twice the level of CT infection and comparable to the level of NG infection. This finding and the information on various correlates (younger age, a greater number of sexual partners and recent CT infection but not HIV status or PrEP use), may be useful for the development of MG screening guidelines.

228

Successful scale-up of syphilis testing linked to routine viral load monitoring in British Columbia

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Background: Routine syphilis screening is recommended among people living with HIV (PLWH). We sought to determine the frequency of syphilis screening over time among PLWH engaged in anti-retroviral therapy in British Columbia (BC) and variables associated with frequent screening.

Methods: We reviewed laboratory results for all individuals enrolled in the BC Drug Treatment Program between January 1, 2015 and December 31, 2019. A syphilis test was defined as a routine screen if performed within 7 days of an HIV viral load measurement. Frequent testing was defined as two or more tests per year. Logistic regression was used to determine variables associated with frequent testing.

Results: Among 8211 patients enrolled, 7364 (90%) had at least one syphilis test over the study period. 93.4% of all tests were routine screens. The proportion tested per year increased over time (71% in 2015 vs. 79% in 2019, p<0.001); as did the proportion of those tested who were tested frequently (72% in 2015 vs. 83% in 2019, p<0.001). Increased testing was observed among MSM (83% in 2015 vs. 90% in 2019, p=0.005), but not among non-MSM (65% in 2015 vs. 72% in 2019, p=0.087). Frequent testing was associated with attending a hospital-based HIV clinic (aOR 5.14, 95% CI 4.65-5.68), community-based HIV primary care clinic (aOR 4.78, 95% CI 4.29-5.33), being MSM (aOR 1.90, 95% CI 1.73-2.08), residing in Vancouver's West End (aOR 1.74, 95% CI 1.55-1.95,) or elsewhere in Vancouver (aOR 1.32, 95% CI 1.19-1.47) compared to the rest of the province, and calendar year (aOR 1.17 per year increase, 95% CI 1.15-1.19).

Conclusion: The vast majority of syphilis testing among PLWH in BC is routine screening linked to viral load monitoring. As HIV monitoring becomes less frequent in stable PLWH, the frequency of syphilis testing could be compromised, and stand-alone testing may be needed.

19

Community Without Borders (CWB) Successes and Lessons Learned, a 3 years Intervention Empowering Latinx Individuals in Toronto

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Background: Latinx individuals have shown an increasing number of infections in the past years, among all other ethnicities. Numbers and percentages are striking, the same is true for the number of programs, sexual health educators, and research investigators who speak Spanish and who are trained to attend the social determinants of health at a micro, meso and macro level, from a city, provincial and national perspectives. CWB was a three-year intervention that accounted for 12 program iteration (4 sessions a year). Over the three years, more than (n=70) participants were part of the different programs.

Methodology: From a quantitative perspective, a pre/post Likert scale was used. From a qualitative perspective, the evaluation forms had space for participants who wanted to share their experience in the group. Also, Hand Mapping, a qualitative methodology that was created in the intervention was used to elicit topics, themes, questions, and level of satisfaction of CWB's individuals. Theory and program science were both used, CWB's curriculum and delivery, and program's evaluation.

Lessons Learned: From an evidence/knowledge model, CWB was a great success, meeting the intervention's goal of increasing participants' sexual health knowledge, HIV testing, and empowerment. Another great contribution was the inclusion of not only gay cisgender men, but also, all Latinx, regardless of gender, identities, or sexual orientation. Another lesson learned was the urgent need to incorporate social media in the program, and the use of technology that defeat geographic restrictions, this was more evident due to the presence of COVID-19 and the need to complete two more interventions under lock down conditions.

Policy Implications: There is an urgent need for policymakers who belong to the Latinx communities, with experience in evidence-based approaches and, both scientific and community expertise, to break barriers between policymakers, funding entities, research institutions, and communities at large.

27

Piloting Mock-ups, Presentations of Evidence, and Q&As as Tools to Help Participants Voice their Opinions During Focus Groups and Interviews about Supervised Injection Services.

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Supervised injection services (SIS) help prevent HIV infection among people who use drugs by providing a space to use pre-obtained drugs and access to sterile injection equipment and health and social services. Due to public controversy regarding SIS, organizations may benefit from conducting feasibility studies to capture stakeholder views to inform their implementation process. However, research shows feasibility studies can be challenging to conduct if participants are hesitant to provide opinions because they lack basic knowledge regarding SIS or have mixed views. In our experience with three SIS feasibility studies, participants remained hesitant to offer their opinions even after hearing verbal descriptions and seeing pictures of SIS. These experiences led us to pilot test the use of “grounding aids,” or tools, objects, and methods used before qualitative data collection to provide research participants with knowledge and experience of SIS to improve their ability and willingness to offer their opinions. In a SIS feasibility study for a specialty HIV hospital conducted in 2019, we introduced focus group (n=70) and interview participants (n=8) to three grounding aids, the focal point of which was a physical mock-up of an SIS (i.e., that they could walk through and touch), and we evaluated the pilot by asking for their opinions about this experience. Participants were less hesitant overall sharing opinions about SIS than in our previous feasibility studies where we did not employ grounding aids and generally agreed that they did not perceive these tools as an effort by researchers to sway their opinions regarding SIS. Future studies evaluating SIS and other controversial facilities may want to consider using grounding aids to reduce participant hesitancy to express their opinions and improve research on concerns related to the implementation of SIS, a valuable tool that reduces HIV infection rates among people who use drugs.

70

An Evaluation of the Impact of CATIE's Services and Resources for People Working in HIV and Hepatitis C in Canada

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Background: CATIE strengthens Canada's response to HIV and hepatitis C by bridging research and practice. We connect healthcare and community-based service providers with the latest science, and promote good practices for prevention and treatment programs.

As Canada's official knowledge broker for HIV and hepatitis C, CATIE provides up-to-date, accurate and unbiased information.

Methods: In 2019, CATIE conducted a national online survey of people working in HIV and hepatitis C including public health, healthcare, not-for-profit organizations and government, to assess the overall impact of our complement of services and resources in knowledge exchange and mobilization. The survey was designed to evaluate CATIE's reach, frequency of use and effectiveness. Frequency descriptives were compiled from 1,973 respondents from across Canada who completed the survey.

Results: CATIE is reaching its intended audiences. Respondents came from a diverse array of organizations working in HIV, hepatitis C, sexually transmitted infections and harm reduction – most of whom (81%) work from an integrated STBBI approach. Collectively these organizations provide a full range of HIV and hepatitis C services across Canada.

Respondents report that CATIE's services and resources increase their knowledge of HIV (95%), hepatitis C (93%) and new developments, best practices and other evidence-informed program innovations (93%) and increase their capacity to respond to the needs of their community (94%).

Ninety-eight percent of respondents report CATIE's services and resources have an overall impact on their application of HIV and hepatitis C knowledge and 92% report an overall impact on their programming. Respondents provided over 602 examples of how CATIE's services and resources have changed their policies, practices and programming.

Conclusion: Respondents feel CATIE is meeting their knowledge exchange needs and expectations. CATIE continues to effectively support and impact HIV and hepatitis C work in Canada.

160

Sexual health service access during the COVID-19 pandemic: Increased use of internet-based sexually-transmitted and blood borne infections (STBBI) testing in British Columbia

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Background: GetCheckedOnline is an internet-based testing service for sexually-transmitted and blood borne infections (STBBI) offered in select British Columbia (BC) communities since late 2014. Users complete an online risk assessment to inform STBBI test recommendations, auto-generating a lab requisition which can be used at any participating laboratory location, with results available online or by phone. While many in-person sexual healthcare services were reduced or stopped due to COVID-19, GetCheckedOnline remained accessible. We describe GetCheckedOnline program utilization and selected risk factors before and during the COVID-19 pandemic.

Methods: We used GetCheckedOnline and linked laboratory testing data to generate descriptive statistics. We compared the mean of selected monthly program measures during the COVID-19 pandemic (March 2020 – December 2020) to the same time period the previous year, defined as pre-pandemic (March 2019 – December 2019).

Results: The median number of monthly test episodes completed was higher during the pandemic (median=1088; n=9470 total episodes completed), compared to pre-pandemic (median=824, n=8237 total episodes completed), despite a sharp decline and rapid recovery in March-May 2020. During the pandemic, the mean proportion of test episodes completed by those using GetCheckedOnline for the first time was 57%; an increase from pre-pandemic (51%). We observed an increase in the percent positivity during the pandemic compared to pre-pandemic (6.44% vs. 5.72%), as well as in the mean proportion of those reporting symptoms (20.3% vs 19.4%) or being a contact to someone with an STBBI (11.0% vs 9.3%).

Conclusion: The increase in first time GetCheckedOnline testers, percent positivity, and those reporting symptoms or being a contact to an STBBI during the COVID-19 pandemic suggest the program has filled a gap in STBBI testing services in BC, and remains a critical service for accessing sexual healthcare.

217

If I Hadn't Come To This Jail with This OPS, I Would Have Overdosed and Died: Inmates' Perspectives on the Overdose Prevention Site at Drumheller Institution.

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Background: A unique initiative in Canada and internationally, Correctional Service Canada implemented an Overdose Prevention Service (OPS) at Alberta's Drumheller Institution June 24th 2019; first inmate participated 10th July. Goals of service include: prevention of overdoses; facilitating entry into psychosocial and drug-treatment services; reduction in needle sharing and in HIV and HCV transmission.
This paper reports on the acceptability of the service from the perspectives of the Institution's inmates.

Methodology: Following informed consent, confidential anonymous semi-structured interviews held with: inmates currently accessing OPS; inmates who had applied and awaiting approval; Chairs of the Inmate Committee; and inmates who wanted to express an opinion on the service.

Results: OPS used 798 times by 30 individuals July 10th 2019 - 28th February 2020. Significant outcomes include (i) Reduction in needle-sharing: OPS participants compared benefits of sterile equipment distribution with previous experiences of attempting to obtain needles: "I no longer have to trust that someone else's needle is clean"; "A clean needle. I don't use a dirty rig no more – a jail rig."; "It's a safe place. It's supervised. It's not in the cells, not in the units."; (ii) Inmates shared their perception that OPS a catalyst in removing stigma around drug use and had opened up discussions around responding to addiction issues: "OPS has made people aware of addiction, its normalising and we're talking about addiction"; "Now OK to admit that I have an addiction, not a secret anymore"; "It's bringing the problem of addiction to the surface"; "Addiction was previously looked negatively upon…… The problem of addiction can now be responded to".

Conclusion: Demonstrated HIV- and HCV-related harm reduction health benefits and movement towards addressing and responding to addiction as a health issue in a safe clinical environment augur well for the ongoing Pan-Canadian scale up of this novel intervention.

171

Findings from the Survey of the impact of COVID-19 on the ability to provide STBBI prevention, testing or treatment including harm reduction services in Canada

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Background: Since the start of Canada's COVID-19 pandemic, challenges in delivering sexually transmitted and blood-borne infection (STBBI) prevention, testing and treatment services, including harm reduction services have been reported. A national survey was conducted to describe the impact of the pandemic on the ability to provide STBBI-related services.

Methods: From November to December 2020, an anonymous online survey was conducted among community-based organizations, public health units and other service providers who directly deliver STBBI services in Canada. Information collected included how service delivery and demand for services were impacted during the pandemic. Preliminary results are presented.

Results: 416 service providers participated from across the country. Demand for services and ability to provide services varied by type of service (Table 1). Almost 40% of service providers noted an increased demand for harm reduction and drug treatment services, while 66.3% noted a decrease in the demand for STBBI prevention and testing services. Almost half (44.0%) of service providers noted a decreased ability to deliver STBBI prevention and testing services. Of service providers that provided remote services prior to the pandemic, 45.5% reported increases in demand for these services, while 36.6% increased their ability to provide such services. 66.1% of service providers created new remote services as a result of the pandemic.

Conclusions: The decreased ability to provide testing will need to be considered when interpreting STBBI trends in 2020-21. Development of new remote services demonstrates service providers' resilience and innovation to pivot delivery models to meet the challenges created by the pandemic.

176

Vulnerability, Stigma, Trauma and Resiliency in the Face of Coronavirus Adversity: Results among a Cohort of People Living with HIV in Ontario, Canada

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Background: Resiliency is associated with improved health outcomes for people living with HIV (PLWH). Our objective assessed the impact of vulnerability, stigma and trauma during the coronavirus pandemic on PLWH's resiliency.

Methods: The Ontario HIV Treatment Network Cohort Study is a community-driven, multi-site clinical cohort of PLWH. A COVID-19-specific module was added to the virtual interviewer-administered questionnaire between May-December 2020. Composite variables examined correlations between subpopulations with perceptions of vulnerability to COVID-19, HIV stigma in healthcare compounded by COVID-19, trauma (traumatic reoccurring thoughts) and resiliency (positive adaptation), chi-square tests were performed.

Results: Analysis includes 1153 participants: 273 women (32% White, 57% Black) and 880 men (69% White, 11% Black). Median age 53, 66% identifying as gay/lesbian/bisexual/queer. More women than men believed PLWH had increased chances of catching COVID-19 (52%-vs.-42%, p=0.015) and that PLWH are more likely to be denied a ventilator (28%-vs.-12%, p<0.001). More men than women (85%-vs.-72%, p<0.001) believed PLWH would not receive equivalent care. 68% believed PLWH were more likely to get seriously ill with COVID-19 (p>0.05 by sex). Women reported significantly more trauma (more than once a week) about: the loss of family/friends (38%-vs.-25%), past experiences of isolation (18%-vs.-11%), dying (19%-vs.-10%), people lost due to HIV/AIDS (10%-vs.-6%). Resiliency was high including: employed creative ways to alter difficult situations (74%), controlled their reactions (81%) and believed they could grow in positive ways by dealing with difficult situations (87%). Among people perceiving stigma, there was a greater experience of trauma (45%-vs.-31%, p<0.001). Among people experiencing trauma, there were greater perceptions of vulnerability (74%-vs.-66%, p=0.012) and stigma (28%-vs.-18%, p<0.001).

Discussion: Despite feeling vulnerable, perceiving stigma in healthcare, and experiencing traumatic recurring thoughts, PLWH reported strong resiliency beliefs and behaviours. Resiliency during crisis is a powerful resource in fostering positive adaptation among PLWH and could be essential for effective psychosocial interventions.

177

The impact of COVID-19 on sexual behaviour, PrEP use, and healthcare access among gay, bisexual, and other men who have sex with men in Canada: Preliminary Findings from Engage-COVID-19

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Background: Engage-COVID-19 is a mixed-method study collecting biobehavioural data to understand the impacts of COVID-19 on gay, bisexual, and other men who have sex with men (GBM) living in Vancouver, Toronto, and Montreal. In this preliminary analysis we describe how the COVID-19 pandemic has impacted the sexual behaviour, PrEP use, and healthcare access of GBM.

Methods: Beginning in 09/2020, we asked Engage Cohort Study participants COVID-19-specific questions. GBM were asked how their sexual activities between 03/2020 to the end of 05/2020 changed when compared with before 03/2020. We report percentages of responses to key questions.

Results: Data were collected from 492 participants as of 12/2020 and is ongoing (Vancouver=214, Toronto=30, Montreal=248). Compared with before the COVID-19-pandemic, participants reported increased engagement in physically distanced sexual activities (e.g., more camming (48.5%), sexting (37.4%), solo masturbation (46.8%)) and decreased behaviours that may increase risk for COVID-19 exposure (e.g., less in-person sex with new casual partners (74.1%), less outside household sexual meet-ups (69.6%)) (Table 1). Half (50%) of GBM taking PrEP reported COVID-19 did not impact their use; however, 19.7% stopped using PrEP completely and 13.8% switched from continuous to on-demand use of PrEP. Only 6.4% of GBM living with HIV reported COVID-19 impacted their access to HIV care. One third (32.8%) of participants reported avoiding health services because of concerns about COVID-19 exposure.

Conclusion: The COVID-19 pandemic led to changes in the sexual behaviours and PrEP use of many GBM during this period. Our preliminary findings also point to significant healthcare access disruptions.

206

Impact of COVID-19 on access to optimal HIV Treatment and vertical transmission: Canadian Perinatal HIV Surveillance Program

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Objectives: To describe demographics, antiretroviral treatment during pregnancy, and vertical transmission (VT) rates in the Canadian perinatal HIV surveillance cohort of births to women living with HIV (WLWH) and to assess the impact of COVID-19 on access to optimal therapy and transmission.

Methods: 23 Canadian pediatric and HIV centres report data yearly, including maternal characteristics, pregnancy combination antiretroviral treatment (cART) and infant outcome. Data from each province is entered in January. The results reported in this abstract will reflect 2019 but will be updated to include 2020 results on presentation.

Results: The number of HIV exposed infants each year has increased over time, with 249 infants born in 2019. In 2019, 34% came from Ontario, 20% from Alberta, 16% from Quebec, 12% from Saskatchewan, 10% from BC and 8% from Saskatchewan; 58% were black, 20% were indigenous, and 13% were white; 63% of women acquired HIV heterosexually, 14% through injection drug use (IDU) and 2.4% perinatally, and 18% were of unknown origin; the proportion of pregnant WLWH receiving less than 4 weeks of continuous cART prior to birth was 2.8%.

Since 2015, there have been 1-5 infants (average=3.2) confirmed infected with HIV; VT dropped from 15% in 1997 to 0.4% in 2019. The proportion of pregnant WLWH receiving less than 4 weeks was 5.7% in 2019, (average of 6.5% over the last 5 years).

Conclusions: VT rates of HIV in Canada remain very low. There continues to be a substantial proportion of WLWH who were on suboptimal cART, thus increasing the probability of transmission. Barriers to adequate access to cART may have been amplified by the COVID-19 pandemic in 2020.

61

Cango Lyec (Healing the Elephant): Incidence of Depression and Post-Traumatic Stress in Northern Uganda in the Decade After Civil War

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Background: The legacy of civil war in Northern Uganda continues to impact health and wellbeing, despite cessation of hostilities in 2006. Syndemic HIV and mental illness are a consequence of war-related traumas; yet, little is known about longer-term impacts following the immediate post-conflict period.

Methods: Cango Lyec (Healing the Elephant) cohort involves conflict-affected populations in mid-Northern Uganda. Individuals aged 13-49 at baseline returned for two follow-ups. Longitudinal data (2011-2015) were collected on socio-demographics, war-related experiences, mental health, and sexual vulnerabilities. Cox proportional hazards regression models were applied separately to those free of probable depression (n=1929) and of probable PTSD (n=1877), respectively, at baseline.

Results: We observed 99 incident cases of depression and 65 of PTSD, over two rounds of follow-up; 54 individuals developed both outcomes. Incidence of depression and PTSD were 27.4 (95%CI:22.2-33.5) and 17.3 (95%CI:13.3-22.2) per 1,000 person-years, respectively. Living with HIV was associated with incident depression (aHR:1.97;95%CI:1.13-3.41) but not PTSD. Other factors associated with incident depression included: older age (aHR:1.04;95%CI:1.01-1.07); PTSD (aHR:15.30;95%CI:8.51-27.54); suicide ideation (aHR:11.27;95%CI:6.43-19.75); attempted suicide (aHR:2.84;95%CI:1.45-5.56); ill health without medical care (aHR:2.18;95%CI:1.33-3.58); and genital ulcers (aHR:2.06;95%CI:1.11-3.80). Associations with incident PTSD included: having lived in ≥2 camps (aHR:2.62;95%CI:1.12-3.45); visiting ones' home community <1 time per month (aHR:2.62;95%CI:1.31-5.24); depression (aHR:2.67;95%CI:1.39-5.14); rape or sexual abuse (aHR:2.84;95%CI:1.35-5.96); and suicide ideation (aHR:16.98;95%CI:9.68-29.78).

Conclusion: We observed high incidence of probable depression and PTSD, despite time that has passed since the end of war in Northern Uganda. Lack of access to medical care and negative health outcomes, including HIV/STIs, were associated with depression, indicating need for wholistic care responding to both physical and mental health and wellbeing. Disconnection from home communities and sexual violence were associated with PTSD, highlighting importance of land-based cultural healing programs that address legacy of war on land tenure and socioeconomic conditions, contributing to predation.

75

Uptake of Hepatitis C treatment among people living with HIV and Hepatitis C

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Objectives: Hepatitis C (HCV) therapy has evolved from interferon and ribavirin-based treatment to more effective and safer direct-acting antiviral (DAA) regimens, offering a promising way to control the epidemic. In British Columbia (BC), DAAs are publicly funded; however, treatment uptake has reportedly remained low; thus, the objectives of this study are to assess access to HCV treatment uptake in a population-based cohort of people living with HIV (PLWH) and HCV.

Methods: We utilized data from the Seek and Treat for Optimal Prevention of HIV/AIDS cohort of PLWH diagnosed between April 1996 and March 2017 in BC, Canada. PLWH aged ≥ 19 years old who were diagnosed with HCV were included in this analysis with provincial HCV treatment data available from 2003-2016. We used logistic regression to model odds of HCV treatment uptake by key characteristics.

Results: A total of 3318 HCV-positive PLWH were included in the study; 900 (27.1%) were women, 2681 (80.8%) had a history of injection drug use, and 746 (22.5%) were men who have sex with men. A total of 723 (21.8%) participants received HCV treatment at least once over the study period; 426 (12.8%) ever received interferon-based treatment, 41 (1.2%) received early DAAs, and 371 (11.2%) received modern DAAs in 2015 or later, of which 94.6% achieved SVR-12. In the multivariate model, women had lower odds of ever having received HCV treatment [aOR=0.74, 95% CI=0.60-0.90], as did people with a history of injection drug use [aOR=0.78, 95% CI=0.63-0.97], after controlling for age and health authority.

Discussion: Our findings indicate that women and PLWH with a history of injection drug use were less likely to be treated for HCV. The needs and realities of women and people who use drugs must be considered in health service delivery to ensure equitable care and treatment for all PLWH and HCV.

81

Men who Paid for Sex in sub-Saharan Africa: Meta-Analyses of 82 Population-Based Surveys of HIV Prevalence, Prevention, Treatment, and Population Sizes (2000-2019)

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Introduction: Men who pay for sex can contribute to population-level HIV transmission through sexual relations with both female sex workers and their other sexual partners, but are often neglected in HIV responses. To inform programs, we conducted a systematic analysis of their population size, HIV burden, testing and sexual behaviors, and treatment engagement in sub-Saharan Africa (SSA).

Methods: We performed random-effects meta-analyses of 82 population-based surveys conducted in 35 SSA countries over 2000-2019. We analyzed HIV prevalence, population size, lifetime sexual partners, HIV testing, condom use at last paid sex, anti-retroviral treatment (ART), and viral load suppression (VLS) among men who reported ever paying for sex. Standardized prevalence ratios (PR; age, rural/urban) are also computed and pooled (by region and overall) to compare characteristics of men who have ever paid for sex to those who did not.

Results: Overall, 8% of men reported having ever paid for sex (95% confidence interval [95%CI]: 6-9%, number of surveys [Ns]=82). Men who paid for sex had, on average, 6.7 more lifetime sexual partners than men who did not pay for sex (95%CI: 5.9-7.4, Ns=58), had higher HIV prevalence (PR=1.6, 95%CI:1.4-1.8, Ns=50), and were more likely to have ever tested for HIV (PR=1.1, 95%CI: 1.1-1.2, Ns=77). Among men who paid for sex in the last year, condom use at last paid sex was 67% (95%CI: 63-71%, Ns=62). Among men living with HIV who paid for sex, ART coverage (PR=1.0, 95%CI: 0.9-1.1, Ns=6) and VLS (PR=1.0, 95%CI: 0.9-1.1, Ns=7) were similar to those who did not pay for sex.

Conclusion: Men who pay for sex are 60% more likely to be living with HIV than men who have never paid for sex. Prevention efforts focusing on this key population should be sustained and strengthened. Such initiatives could be important to reduce overall HIV incidence.

117

Geographic heterogeneity in HIV prevalence amongst female sex workers attending a treatment and prevention program in Nairobi, Kenya

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Introduction: Kenya has one of the largest HIV epidemics in the world. Although HIV incidence in Kenya has shown signs of recent decline, more targeted interventions are needed for key populations, including female sex workers (FSWs), to decrease incidence further. One approach is to target interventions at geographic 'hotspots' where FSWs meet their clients. In order to inform such approaches, we aimed to understand heterogeneity in the distribution of HIV prevalence by hotspots and by residence within Nairobi.

Methods: Data were collected as part of enrolment in the Sex Workers Outreach Program (SWOP) in Nairobi, Kenya from 2014 to 2017. Median age of FSWs was 29 years (IQR: 24-35), with a median of 5 clients (IQR: 3-10) in the previous week. The geographic unit of analysis was constituency (n=17); thus, hotspots and residences were aggregated to the constituency level. Inequality in the geographic distribution of HIV prevalence by sex work hotspot and residence was measured using the Gini coefficient; coefficient scores range from 0 to 1, with a score closer to 1 indicating perfect inequality. 95% confidence intervals (95% CI) were generated using 1000 bootstrapped estimates in Stata.

Results: A total of 11,899 FSWs were included. Overall HIV prevalence was 16%, with a range between 7%-52% between the constituencies. The Gini coefficient was 0.41 (95%CI: 0.25-0.58) for hotspot constituency, indicating a high degree of heterogeneity in the distribution of HIV prevalence. Approximately 55% of HIV positive FSWs worked in 4 constituencies. In contrast, constituency of residence had a Gini coefficient of 0.08 (95% CI: 0.06-0.10), suggesting minimal heterogeneity by residence.

Conclusion: HIV prevalence in FSW is heterogeneous by place of work within Nairobi. As HIV declines in Kenya, tailoring interventions to FSWs at highest HIV risk becomes increasingly important, in order to reduce HIV incidence toward UNAIDS 2030 targets.

159

Exploring the dynamics of workplace typologies for sex workers in Eastern Ukraine

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Workplaces for sex workers have various physical, social, political and economic conditions which create different contexts for doing sex work. Different sex work environments can contribute to HIV risk, including experiences of violence (e.g. by clients and police), violations of social and labour rights, and experiences of stigma and discrimination.

We conducted a cross-sectional bio-behavioural survey with 560 female sex workers between September 2017 to October 2018 in the city of Dnipro, approximately 200 km from the conflict in Eastern Ukraine. We describe workplace typologies for sex workers in Dnipro, the demographic profile and earnings of women working in different workplace typologies, as well as their client volume, experiences of violence and perceptions of safety.

Most respondents (59%) reported working in one workplace over the preceding 12-months. The majority named "offices" (40.0%) and apartments (27.3%) their main workplaces. Although hourly wage and client volume varied by workplace, participants' monthly sex work earnings were comparable across typologies. Highway-based sex workers earned a median of 400 UAH/hr (IQR 300-400) ($14.70 US) and had the most client visits in a 30-day period (median 39.5, IQR 27-49) versus artclub-based sex workers earned a median of 1600 UAH/hr (IQR 1000-1850) ($58.90 US) and had the least visits (median 23, IQR 15-33). While sex workers in Dnipro earned a higher monthly wage from sex work than the city mean, they also reported experiencing high rates of violence and a lack of personal safety at work. Highway-based sex workers reported more physical violence by law enforcement compared with sex workers at "offices" (16.7% and 7.1% respectively).

Gaining a better understanding about sex work workplaces in Dnipro can help local HIV prevention programs optimize their services to meet the needs of sex workers and respond to changing work environments due to ongoing conflict and the evolving COVID-19 pandemic.

185

Ethno-racial differences in HIV and sexually transmitted infections(STI), and related preventive and risk behaviours among gay, bisexual and other men who have sex with men in Montreal, Toronto, and Vancouver

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Background: Gay, bisexual and other men who have sex with men (GBM) bear a disproportionate burden of HIV and STIs in Canada. We examined racial/ethnic differences in HIV, bacterial STIs, and related behaviors among GBM in Montreal (M), Toronto (T), and Vancouver (V).

Methods: Using baseline data from the Engage cohort study (N=2,449; 440 self-reported living with HIV), a respondent-driven sampling (RDS) study of GBM in MTV, we compared RDS-adjusted proportions of laboratory-confirmed HIV, STIs (syphilis, gonorrhea, and chlamydia), preventive- behaviors (HIV/STI testing: never/ever, within 6 months; and PrEP use, within 6 months) and risk-behaviours (sero-discordant condomless anal sex: SDCAS, within 6 months), by 9 racial/ethnic categories (white, Black, Latino/Latinx, East/Southeast Asian, Indigenous, South Asian, West Asian/North African, Unidentified/Others, and Mixed race/ethnicity) within-city (white as reference) and between-cities using non-parametric tests for unequal sample sizes and low cell counts.

Results: Montreal recruited the highest number of non-white GBM (RDS-adjusted 50%) followed by Vancouver (29%) and Toronto (22%). Differences by race/ethnicity within-city as well as across cities were observed. For example, HIV prevalence among West Asian/North African (3.9%) was lower compared with white GBM (15.9%; p=.02) in Montreal, but higher (50.5% vs. 23.9%; p=.02) in Toronto. Black GBM were less likely to report SDCAS in Toronto (11.2% vs. 41.1%; p=.004) and in Vancouver (15.2% vs. 44.5%; p=.001), but more so in Montreal (59.2% vs. 37.5%; p=.01). Regarding HIV testing, Black GBM were more likely to report testing in Toronto (79.9% vs. 49.4%; p=.01) and in Vancouver (96.6% vs. 57.3%; p=.002) than white GBM.

Conclusion: HIV, STI prevalence, preventive, and risk-behaviours differ by race/ethnicity within-city as well as between-cities in the three largest cities of Canada. Despite limited statistical power related with low cell counts for some ethno-racial categories, findings suggest local, culturally-grounded, targeted efforts for diverse ethno-racial GBM are needed.

47

Programmatic Mapping of Virtual Platforms and Size Estimation of Online Men who have Sex with Men in Delhi, India

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Introduction: In India, Key Populations (KPs), such as men who have sex with men (MSM), bear a disproportionate burden of HIV disease. Conventional targeted intervention programs (TI) mitigate HIV transmission by focusing on engaging MSM and delivering services in physical locations. As solicitation behavior within India's MSM community shifts online, novel approaches are needed to map virtual platforms where sexual networks are formed.

Objectives: To estimate the number of MSM in Delhi using virtual platforms to meet sex partners and to characterize the platforms.

Methodology: This study was conducted in all eleven districts of Delhi in 2020. The study population included consenting MSM, over 18 years of age, who used virtual platforms to meet sex partners. A list of virtual platforms was established with community consultations, including organizations working on HIV Prevention for MSM. Size estimation was carried out by counting the number of active online users with adjustments for duplication. 565 individuals consented to structured interviews.

Results: 28,058 MSM (range 26,000 to 30,000) use virtual sites to find sexual partners. We identified 14 virtual sites, 19 social networking pages and 112 messenger groups, all exclusively for MSM. 5 virtual platforms met feasibility criteria for virtual mapping. These platforms were most active at night (81%) and on Sundays (94%). Among participants, 16% were aware of organizations providing HIV services and 7% were contacted by peer educators in the preceding three months. 42% visited a physical location for solicitation in the month prior to the study.

Conclusion: TI programs that focus on physical hotspots do not reach the majority of MSM who use virtual platforms for sexual solicitation. MSM active on virtual platforms have a low awareness of HIV services. Virtual mapping must be incorporated into current public health interventions to reach MSM unreached by traditional programs.

57

Synergizing Health Interventions for Toronto Gay and Bisexual Men (SHIFT): Examining the Prospect of Task-Shifting HIV Prevention Services from Healthcare Providers to Community Workers

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Background: Several factors continue to place gay, bisexual and other men who have sex with men (GBM), particularly those marginalized by racism and other identities and experiences, at disproportionate risk for HIV and STBBIs. These include limited access to HIV prevention services (HIV/STI testing, PrEP), and mental health services. Given close ties to communities, AIDS service organizations (ASOs) are well-positioned to provide some of these services yet typically lack the resources or training to do so. Task-shifting, or the delegation of some non-regulated clinical tasks to non-clinical personnel, has been used in settings where resources are limited or where specialized services are needed.

Method: The Synergizing Health Interventions for Toronto gay and bisexual men (SHIFT) study - a community-based, multi-phase, implementation project - was conducted to explore the possibility of task-shifting HIV/STBBI prevention services for GBM in Toronto. Interviews were conducted with 31 healthcare providers (i.e., physicians, nurses, psychotherapists, pharmacists) and community workers who work with GBM regarding the prospect of giving ASO workers a more quasi-clinical role to increase uptake for HIV/STI testing, PrEP, and mental health services. Interview data were transcribed verbatim and thematic analysis was employed to suggest possible future implementable solutions for increased access to care.

Results: Our findings revealed substantial agreement between healthcare providers and community workers about the services that could be task-shifted to ASOs. In particular, self- or home-testing for HIV and STIs, and PrEP education, initiation, and follow-up provided opportunities to leverage the skills and expertise of community workers. Responses to the question of mental health were more complex. With the help of participants and other community stakeholders, future SHIFT project work includes the development and implementation of a task-shifting plan to increase access to these essential services for a diversity of GBM in the city of Toronto.

139

Exploring the Impact of a Novel Virtual PrEP Care Model in Canada Among Gender and Sexual Minority Communities

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To combat the HIV Epidemic, the concept of pre-exposure prophylaxis (PrEP) has gained considerable traction since demonstrating efficacy in 2012 and approval in Canada in 2016. Unfortunately, this HIV prevention method has not been taken up ubiquitously by those most at risk for many reasons, including difficulty in accessing care. Innovation, and necessity during the COVID pandemic, has increased the use of technology with new care models providing 100% of PrEP care virtually.

This presentation will focus on the impacts and early findings of Freddie, a novel and entirely virtual PrEP care model in Canada focused on gender and sexual minority communities. This online health program connects those most at risk of HIV transmission with affirming prescribers across multiple provinces to break down physical and social barriers to PrEP initiation and ongoing use.

Presenters will discuss the innovative components of Freddie's virtual care model, explore findings as they relate to PrEP uptake and initiation by speaking to its initial successes and challenges, as well as how it addresses PrEP access barriers in Canada. This includes Freddie's focus on LGBTQ2S+ Canadians who are known to be at higher risk of HIV and historically have faced extraordinary barriers accessing sexual health care in inclusive settings. The intervention explored in this presentation continues to address such barriers through an innovative and accessible care model.

152

Expanding the reach of internet-based testing for sexually-transmitted and blood-borne infections: Awareness of GetCheckedOnline among sexual minority men in British Columbia, Canada

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Background: GetCheckedOnline, BC's internet-based testing program for HIV, Hepatitis C, and other sexually-transmitted infections, launched in Vancouver in 2014 and expanded in 2016 to six additional communities in Interior and Island Health regions. We sought to measure post-expansion awareness and identify associated factors among gay, bisexual, and other men who have sex with men (gbMSM).

Methods: Sex Now 2019 was an online health survey of gbMSM aged ≥15 years in Canada. BC residents were asked questions related to GCO implementation outcomes. Participants were categorized by Forward Sortation Area into regions with sites offering GetCheckedOnline, by health authority (i.e., Greater Vancouver, Island, Interior, and all other regions of BC). We used logistic regression modelling including all significant factors to quantify associations with awareness and report adjusted odds ratios and 95% confidence intervals (AOR [95%CI]).

Results: Among BC participants (n=1500, median age: 40 years), 33.5% were aware of GetCheckedOnline. Compared with awareness among Greater Vancouver participants (36%, n=336/932), Island participants were more aware (50%, n=77/155, AOR=2.49 [1.56-4.02]), Interior participants were similar (40%, n=18/45, AOR=1.60 [0.69-3.68]) and other BC regions were less aware (17%, n=47/269, AOR=0.45 [0.29-0.70]). Greater GetCheckedOnline awareness was also associated with identifying as queer (AOR=1.50 [1.05–2.13]), being out to healthcare providers (AOR=2.12 [1.33–3.43]), using ≥3 geolocation-based sex-seeking apps (AOR=1.95 [1.32–2.91]), and past-year involvement in LGBTQ-specific activities (AOR=1.53 [1.09–2.17]). Awareness was lower among participants who had never tested previously (AOR=0.21 [0.07–0.55]) and who usually tested through their family doctor (AOR=0.53 [0.35–0.81]).

Conclusion: Awareness of GetCheckedOnline was highest in areas where it was available and promoted. Increasing GetCheckedOnline promotion to gbMSM who are not out to their healthcare provider, do not usually test at sexual health clinics, or are less connected with LGBTQ communities may improve program reach.

156

Barriers and Facilitators to Pre-Exposure Prophylaxis Access: An Integrative Review

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In 2012, pre-exposure prophylaxis (PrEP) was approved as an HIV-prevention intervention. PrEP is a highly effective strategy for reducing the risk of HIV acquisition, particularly in populations at high risk of contracting the virus. In 2015, the World Health Organization released treatment guidelines recommending PrEP for all populations at substantial risk of HIV infection. While several countries and jurisdictions cover the cost for PrEP, barriers to access remain and influence the potential impact on the number of new HIV infections. In this integrative review of 48 studies, we explored the current barriers and facilitators to PrEP access among 11 key populations. The barriers included stigma, lack of PrEP knowledge, cost, side effects, PrEP compliance and adherence, low-risk perception, provider barrier, medication mistrust, and shame. The facilitators that can mitigate PrEP access barriers included cost, availability of a healthcare provider and insurance, knowledge and trusted source of information about PrEP, safer sexual practices, side effects, availability of services, and social support. Lastly, we provided potential interventions and recommendations that stakeholders and decision-makers can utilize to advance practice guidelines and health policies that will improve PrEP access among high-risk populations in Canada.

190

Prevalence and Correlates of HIV Testing among Black Heterosexual Men in Toronto: Findings from the weSpeak Study

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African, Caribbean, and Black (ACB) men in Canada face a significantly higher risk of HIV infection relative to other men. Despite this concern, only few studies have specifically focused on the usage of HIV testing services among ACB men. To contribute to the literature and health policy in Canada, we seek to understand the prevalence and correlates of HIV testing among heterosexual ACB men in Toronto. We use a sample of 325 self-identified heterosexual Black men in Ontario that participated in the weSpeak study that examines HIV vulnerability and resilience among ACB men. Guided by the Andersen's framework of health services utilization, we fitted negative log-log regression models to cross-sectional data of ACB men who are 16 years or older. Findings indicate that: (1) ACB men with some postsecondary education (OR=0.57, p<0.1) and high school or below (OR=0.53, p<0.1) are less likely to have ever been tested for HIV compared to their counterparts with university education or higher; (2), Men who identify as Muslim are less likely to have ever been tested for HIV than their colleagues who identify as Christian (OR=0.56, p<0.1); (3) foreign-born men are more likely to have ever been tested for HIV than their Canadian-born counterparts (OR=2.79, p<0.001); (4) unemployed men (OR=2.14, p<0.05) and those with part-time employment (OR=1.90, p<0.05) are more likely to have ever been tested for HIV than their counterparts with full-time employment; and (5) ACB men who report consistent usage of condoms are less likely to have ever been tested for HIV than those with inconsistent usage (OR=0.55, p<0.01). Based on these findings, we recommend further research to understand the barriers to HIV testing and the design of a more nuanced population-based approach to HIV testing that incorporates case-management or various incentives.

194

Interest in alternative sexual health service delivery methods during the COVID-19 pandemic in British Columbia

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In response to the COVID-19 pandemic, sexual health services have begun to adapt alternative service delivery methods that reduce in-person contact (e.g., telemedicine, virtual health). We sought to understand interest in alternative service delivery methods among BC sexual health service clients during the pandemic.

We used data from an online anonymous survey administered from 21/07/2020-04/08/2020 to clients (≥16 years old) who had used the BC Centre for Disease Control's sexually-transmitted infection (STI) clinic and/or the GetCheckedOnline testing service in the year prior to COVID-19 public health responses (03/2020). We described participants' likelihood of using alternative sexual health service delivery methods (if available), and conducted bivariate analysis to examine its association with experiencing any sexual health service access barrier during the pandemic.

Of the 1198 survey participants (aged 17-76 years), 48% identified as men, 47% as women, and 5% as another gender; 71% identified as White, 24% as racialized minorities, and 4% as Indigenous. Support for using alternative STI testing models was high overall, with 88% likely to use at-home self-collection kits and 79% likely to use an express testing model (i.e., phone/video triage prior to specimen collection at a clinic). More participants were likely to discuss sexual health with a health care provider over the phone (64%), compared with video visits (53%) and text (49%). Text messaging to receive STI test results and reminders were of high interest (71% and 63% likely to use, respectively). Likelihood of using alternative service delivery methods did not differ by participants' experience of access barriers, where 66% of total participants reported having avoided/delayed seeking services during 03/2020-07/2020.

Likelihood of using alternative methods of sexual health service delivery was high, even among participants who did not avoid/delay seeking services. Sustaining and expanding such services would facilitate access during and beyond the COVID-19 pandemic.

199

Trends in PrEP awareness and PrEP uptake among Gay, Bisexual and other Men who have Sex with Men (GBM) in Vancouver, Toronto and Montreal

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Background: Availability and public funding of pre-exposure prophylaxis (PrEP) for HIV may vary by provincial policies in Canada. We conducted a prospective longitudinal study to assess trends and correlates of PrEP awareness and use among gay, bisexual and other men who have sex with men (GBM) in Vancouver, Toronto and Montreal.

Methods: Sexually-active GBM, aged ≥16 years, were recruited through respondent-driven sampling (RDS) from February 2017 to August 2019. Participants completed a Computer-Assisted Self-Interview to assess PrEP awareness and use. Analyses were limited to HIV-negative GBM with data collected to March 2020. We used generalized estimating equations accounting for two levels of clustering (RDS recruitment chain; participant) to evaluate temporal trends (monthly prevalence) of awareness and past six-month usage of PrEP among HIV-negative participants. Multivariable models were built to identify correlates of PrEP awareness and use and used backward selection to minimize QIC.

Results: We recruited 2008 HIV negative GBM (N=622 from Vancouver, N=418 from Toronto, and N=968 from Montreal). Awareness of PrEP increased significantly in all three sites: Montreal, 81.2% during the first 6-month period to 91.4% during the last 6-month period (p<0.001); Toronto, 94.2% to 96.6% (p=0.036) Vancouver, 90.2% to 98.3% (p<0.001). Use of PrEP also increased significantly in all three sites: Montreal, 14.2% during the first 6-month period to 39.3% during the last 6-month period (p<0.001); Toronto, 21.4% to 31.4% (p<0.001); Vancouver, 21.7% to 59.5% (p<0.001). Multivariable models also found that GBM in Vancouver had greater odds of PrEP awareness (aOR=1.94 95%CI=1.32-2.87) and PrEP use (aOR=2.05, 95%CI=1.60-2.63) compared to GBM Montreal; results from Toronto were not significantly different from Montreal.

Conclusions: PrEP awareness was very high among GBM in all three cities, but uptake was much higher in Vancouver. Full public funding and active health promotion for PrEP in BC may have accounted for these differences.

219

Prison Needle Exchange Program in CSC: Progress to Date

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Background: Consistent with the Canadian Drug and Substance Strategy and approaches to harm reduction, Correctional Service Canada implemented a prison-based needle exchange program (PNEP) in June 2018. The objectives of the program are to reduce the sharing of non-sterile needles, to provide opportunities for health teaching and treatment, to reduce HIV and HCV transmission, and to reduce the incidence of skin infections related to drug use.

Program Elements: Participation in PNEP is voluntary. The program builds on a Threat and Risk Assessment (TRA) model that has proven successful in managing medical sharps in the correctional environment (insulin cartridges, lancets and EpiPens®). The TRA process ensures that security staff are able to assess and mitigate potential security risks in the units.

Participants sign a contract outlining program expectations and are issued a “PNEP kit” which includes a sterile syringe and needle, a sterile mixing cup, filters, sterile water, and vitamin C. PNEP kits and consumables are exchanged at health services as required.

Progress: Following an initial launch at two sites, by Dec 2020 PNEP was available at 11 sites (5 women’s and 6 men’s). As of October 2020, 185 inmates have expressed interest in the program (24, or 13% wanted information only). Of these 6 were streamed into alternate treatment programs. Of 130 TRA completed, 112 (86%) were supported via the TRA. Of the 112, 38 were active participants and 9 (8%) had left the program for alternate treatment programs.

Conclusions: While barriers remain to program implementation across the country, PNEP is a viable harm reduction program in CSC in order to reduce the sharing of non-sterile needles and prevent HIV/HCV transmission. In addition, by facilitating non-judgemental clinical discussions on drug use in healthcare, PNEP has been successful at streaming patients with addictions into alternate modes of care.

224

Spirituality and Resilience as the pillars of strength for African, Caribbean, and Black Men in dealing with HIV/AIDS: a qualitative study in Ottawa.

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Background: African Caribbean Black communities are disproportionately affected by the HIV/AIDS epidemic. Whilst ACB people constitute 4.3% of Ontario's total population, they account for 18.8% of people infected with HIV through heterosexual contact. Religious and spiritual influence on health beliefs and practices are multifaceted. However, this has been minimally explored in the context of HIV in the ACB community in Canada. This paper examined the role of Spirituality in building Resilience of ACB men's deal with HIV/AIDS in Ottawa.

Methodology: We used a multi-phase mixed-method informed by Community Based participatory research (CBPR) approach to engage straight Black men. Phase 1 was primarily qualitative and data sources were Focus Group Discussions and Individual in-depth Interviews involving 170 participants. Data were transcribed verbatim and analyzed with Nvivo guided by thematic analysis.

Results: The major themes of the study included spirituality, resilience, and community resources as strategies for coping with HIV. Community resources such as local ethnocultural health and service organizations and faith-based organizations as resources for well-being. Study participants described that Spirituality in the form of organized religion as Christianity plays a very crucial role to develop resilience and cope with desperate life events, trauma, stress, and other forms of risk. The Church has become a major rally point where most ACB meet providing one of the most important bonding to this highly heterogeneous group.

Conclusion: In the context of HIV/AIDS prevention and service utilization in the ACB community, spirituality helps people to cope with stigma and discrimination, and to facilitate access to care and support. Spirituality was identified as a source of strength, resilience, and wellbeing. Thus, it is vital for health and social service organizations to meaningfully engage the ACB community and faith-based institutions.

Keywords: Spirituality, Resilience, HIV/AIDS, ACB men.

243

High acceptability of online sexually transmitted and blood-borne infection (STBBI) testing for sexual minority men living in Ontario, Canada

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Compared to heterosexuals, gay, bisexual, and other men who have sex with men (gbMSM) are disproportionately affected by sexually transmitted and blood-borne infections (STBBIs). Barriers accessing in-person clinical services experienced by gbMSM, including distance and limited hours, has been exacerbated by the COVID-19 pandemic. Online STBBI testing addresses these barriers, however it is not available in Ontario. We assessed acceptability of online STBBI testing, barriers to clinic-based STBBI testing, and the perceived benefits and drawbacks of this service among gbMSM living in Ontario.

Sex Now 2019 was an online national bilingual cross-sectional survey of gbMSM aged ≥15. Participants were asked on a 5-point scale (very likely – never) how likely would they use an online STBBI testing service. Participants were also asked to select their reasons for delaying STBBI testing and their perceived benefits and drawbacks in using online STBBI testing.

The Ontario sample included n=2375 gbMSM (median age: 38 and 75.4% gay). A third (35.8%) reported no delays in STBBI testing. However, many delayed testing due to being too busy (26.4%) or inconvenient clinic hours (23.9%). Acceptability for online STBBI testing was high: 78.8% reported they would likely use this service. Convenience (61.9%) and saving time (62.7%) were the two most commonly endorsed benefits, while concerns around the privacy of one's information was the most selected drawback (36.5%).

Acceptability of online STBBI testing was high among a sample of gbMSM living in Ontario. Implementation of this service within the province may address STBBI testing barriers experienced by this population.

254

Sexual health service needs by gender and sexual orientation among clients in British Columbia during the first few months of the COVID-19 pandemic response

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Background: Existing disparities in sexual health service access experienced by sexual and gender minorities may have been exacerbated by public health responses to the COVID-19 pandemic. We describe differences in service access among a diverse sample of sexual health service clients in British Columbia (BC).

Methods: We used data from the Sex in the Time of COVID-19 survey administered from July 21-August 4, 2020. Clients >15 years old who had visited the BC Centre for Disease Control's STI clinic or GetCheckedOnline, BC's internet-based testing program, in the year prior to March 2020 were invited to complete the online anonymous survey. We describe sexual health needs and service access during the initial months of the pandemic, stratified by gender and sexual orientation: heterosexual men (het-men), sexual minority men (SMM), heterosexual women (het-women), sexual minority women (SMW), and non-binary/genderfluid people (NB).

Results: Of n=1196 survey participants (median age: 32; 4% Indigenous; 24% racialized minority), 21% (n=247) were het-men, 28% (n=331) were SMM, 29% (n=342) were het-women, 18% (n=221) were SMW, and 5% (n=55) were NB. Almost two-thirds of SMW (65%) and het-men (62%) needing sexual health services, including STI testing, had unmet sexual health needs. Most SMW (73%) and NB participants (92%) reported any reason for delaying/avoiding sexual healthcare. Details of sexual health service needs and access barriers are presented in Table 1.

Conclusion: Inequities in sexual health care access experienced by sexual and gender minorities must be addressed in service planning and delivery throughout and beyond the COVID-19 pandemic response.

16

Equitable timing of HIV diagnosis prior to pregnancy

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Objective: Advances in the availability and effectiveness of antiretrovirals during pregnancy has led to a significant reduction in perinatal HIV transmission. Recent guideline changes suggest that initiating antiretrovirals prior to conception can lead to an overall negligible risk of transmission. Achieving this possibility necessitates that all women living with HIV know their HIV status prior to pregnancy. In this study, we aimed to determine the proportion of women in Ontario diagnosed with HIV prior to conceiving and to identify the timing of HIV diagnoses made during pregnancy.

Methods: A retrospective population-level cohort study was performed using linked health administrative databases at ICES and the Ontario HIV database to establish maternal HIV status and timing of HIV diagnosis. All women living with HIV in Ontario who gave birth between April 2006 and March 2018 were included and demographics were assessed. Additionally, our sample was stratified into three-year intervals to assess trends in diagnosis timing across years.

Results: Our findings demonstrate a significant proportion of women living with HIV (87.9%) were diagnosed prior to pregnancy. Among diagnoses of HIV made during pregnancy, the majority (55%) occurred in the second trimester.

Conclusion: Using an Ontario perspective, we highlight the importance of diagnosing HIV prior to pregnancy rather than relying on prenatal HIV screening during the first or second trimester, which is typically the standard of care globally. We call for a global strategy to aid with pre-conception screening for women of reproductive age and specifically for women at high risk for HIV.

115

Chemsex use and incidence of sexually transmitted infections in the l'Actuel pre-exposure prophylaxis (PrEP) cohort in Montréal (2013-2020)

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Introduction: The use of illicit substances during sex (chemsex) among gay, bisexual and other men who have sex with men (gbMSM) has been associated with transmission of sexually transmitted infections (STI), including HIV. Pre-exposure prophylaxis (PrEP) is highly effective at preventing HIV transmission, addressing an important HIV prevention need among those practising chemsex. This study aims to assess whether chemsex is associated with STI incidence among PrEP users.

Methods: We use data from the l'Actuel PrEP Cohort including baseline sociodemographic and behavioural data and follow-up STI testing from 2013-2020 among gbMSM and transgender women. We estimate the incidence of chlamydia and gonorrhea and use Kaplan-Meier curves to examine differences among individuals who reported chemsex at baseline and those who did not. We also estimate the impact of reporting chemsex at baseline on STI incidence over 24 months following PrEP initiation using Cox proportional hazards regression.

Results: A total of 2,090 individuals (2,086 gbMSM, 4 trans women) consulted for PrEP and attended at least one follow-up visit, contributing 1,477 years of follow-up. There were no incident HIV infection among patients who were on PrEP In the chemsex group, crude incidence rates for chlamydia, gonorrhea, and either STI were 28, 39 and 60 diagnoses per 100 person-years, respectively; compared to 23, 24 and 47 in the no-chemsex group. When controlling for age, education, income and year of baseline consultation, the hazard of being diagnosed with gonorrhea and/or chlamydia was 30% higher (adjusted hazard ratio = 1.3; 95%CI: 1.1-1.6) among participants reporting chemsex at baseline.

Conclusion: Among PrEP users, chemsex is associated with an increased incidence of gonorrhea and chlamydia. The high incidence of STIs among people who report chemsex highlights the importance of PrEP for this population and the need for tailored interventions. Future work will examine potential mediators of this association.

198

Trajectories of PrEP use in gay, bisexual and other men who have sex with men (gbMSM) and trans people according to eligibility criteria in France

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Context: PrEP, available and free of charge in France, is gaining popularity among gbMSM, but is still underused in this at-risk population.

Objective: To investigate factors that predict PrEP use among an eligible sample (PrEP users vs. non-users).

Methods: Data was collected through an online questionnaire completed by 10,853 French participants (Net Gay Barometer, 2018). Amongst 8,411 HIV-negative gbMSM and trans people living in France, 3,251 (38.7%) were considered eligible to PrEP according to French guidelines, out of which 445 (13.7%) were already PrEP users. Univariate and multivariate logistic regression were used.

Results: Although similar in many aspects to other eligible participants, PrEP users tend to engage in riskier sexual practices with their casual male partners than their non-user counterparts. Our multivariate model accounted for nearly 53% of the variance of the probability to take PrEP when eligible (pseudo-R2=0.53). After controlling for their more advantageous sociodemographic profile, it seems that concerns with HIV prevention and a high perceived efficacy of PrEP to protect against HIV are key predictors of PrEP use.

Conclusion: The proportion of gbMSM and trans people eligible to PrEP that do not use it is high. In the context where PrEP is free in France and will soon be made accessible through general practitioners, efforts must be made to recommend it to these people. PrEP use appears to be associated with more abundant and diverse sexuality and a higher prevalence of STIs. PrEP follow-up facilitates early detection and prompt treatment of STIs, when treatment is available.

20

12 years of Sexual Health Interventions Experience Working with Latinx Individuals: Mano en Mano, Chicos Net, and CWB. Evidence, Program Science, Freire's Empowerment, and KTE.

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Background: Back in 2006, the International AIDS conference was placed in the city of Toronto, changing HIV/AIDS forever in Canada. Antiretrovirals were in some way still “new”, condoms were a physical barrier, and there was a need for reducing stigma and ignorance in communities at risk. The event helped to fuel the opening of the HIV prevention program (CSSP), in downtown Toronto, with the idea of facilitating more participants coming for services and information. There was a lack of interventions, at the time. The OHTN and researchers joined forces for the creation of the first Latinx HIV intervention called “Mano en Mano” (MM) (evidence published in a journal), MM used program science to adapt an intervention from California. After 3 years, and with local experience gained, an updated intervention was created, “Chicos Net” (CN). CN published its theoretical model, advancing science, and theoretical bases. Finally, “Community Without Borders” (CWB), was in place from 2017-2020 (pre-and during COVID).

Core Elements: Grounded on evidence-based, program science, focus groups, communities scan, program evaluation, and one-on-one interactions with members of the community, intervention’s four objectives have consisted. 1) To increase sexual health information concerning HIV/STI’s, reduce HIV stigma, and inform about PrEP, PEP, and U=U. 2) To reduce social isolation and introduce peers one to another (friendship). 3) Reduce stigma and internalized homophobia that hunts individuals. 4) To develop critical consciousness (Freire’s).

Next Steps and Challenges: a) Funding has been a challenge, the different programs had to apply for funding packages, taking time, energy, and momentum from front-line workers.
b) An evaluation has revealed the need for a case manager for aiding an individual’s challenges.
c) The program needs an official evaluator professional, to improve data collection, interpretation, and KTE activities.
d) The program needs to use more social media to alleviate geographical challenges.

43

Examining Epidemiological HIV Risk Factors and Underlying Risk Context for Youth from the Middle East and North Africa within a Canadian Context (YSMENA Study): A Scoping Review of the Literature.

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Introduction: HIV is the second leading cause of death among young people globally and adolescents are the only group where HIV mortality is not declining. A rise in new HIV infections in the MENA since 2001 has placed it among the regions with the fastest growing HIV epidemic globally. In Canada, the number of newcomers from the MENA is expected to increase rapidly between 2006 and 2031 and more than triple in the next 25 years. Canadian MENA youth bear a disproportionate burden of STIs including HIV due to war displacement, poverty and homophobia. There is a major gap in sexual health services to this vulnerable group.

Objective: Funded by the Canadian Institutes of Health Research (CIHR), the purpose of this scoping review is to identify epidemiological HIV risk factors and underlying risk context for youth residing in or originating from MENA.

Methods: Bibliographic databases were searched from 1990 to 2019 to identify HIV risk factors among youth aged 16 to 29 residing in or originating from the MENA and scoping review methods were used.

Results: Screening of 5,853 citations resulted in 57 studies from 18 MENA countries. "Risk behaviours" themes, included: overlapping risky behaviours among youth who inject drugs, lack of access to HIV testing, condomless sex, multiple sex partners among young men who have sex with men , and overlapping risk behaviours among young sex workers. "Challenges" included: peer pressure, inhibition about discussing sexual health, limited sex education, low condom use, and lack of access to HIV prevention services, especially testing.

Conclusion: Scarcity of rigorous studies limit what is known about HIV epidemiology among MENA youth. Homophobia, transphobia, stigma around drug use, and illegal status of sex work promote risk behaviours. In Canada, a need for developing culturally-relevant resources and interventions for this emerging youth community is paramount.

105

Social-structural Inequities associated with Housing Instability among Women Living with HIV over 10-year period: Urgent Need to expand Women-centered and Trauma-informed Housing Models

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Background: Cisgender (cis) and transgender (trans) women living with HIV (WLWH) experience numerous barriers to stable housing, with limited evidence available for developing safe housing programs. This study is the first to apply the Canadian Definition of Homelessness (CDOH) to the housing status reported by WLWH with the objective to investigate the prevalence and correlates of housing status.

Methods: This study was informed by a longitudinal community-based open cohort of cis and trans WLWH aged 14+. The main outcome of housing status was a four-category variable derived based on CDOH, and included the following categories, measured in the last six months: unsheltered, unstable, supportive housing, and stably housed (reference). The relationship between social-structural correlates and housing status were analyzed using bivariate and multivariable logistic regression models using generalized linear mixed model (GLMM) with random intercepts. Adjusted odds ratios (AOR) and 95% confidence intervals [95%CI] were reported.

Results: Our study followed 336 participants (1930 observations) in 2010-2019. At baseline, 24% participants were unsheltered; 47% had unstable housing; 12% stayed in supportive housing; 16% had their own stable housing. Our cohort includes disproportionately high representation of Indigenous (57%) and other racialized women (9%) compared to general population in BC. Multivariable analysis revealed that recent (last six months) hospitalization was associated with being unsheltered (AOR=4.89, 95%CI:2.64-9.04) and unstable housing (AOR=7.83, 95%CI:4.63-13.25); recent experience of violence was associated with being unsheltered (AOR=4.67, 95%CI:2.54-8.60) and unstable housing (AOR=3.00, 95%CI:1.75-5.12); recent stimulant use was associated with being unsheltered (AOR=2.73, 95%CI:1.59-4.69) and supportive housing (AOR=2.32 95%CI:1.42-3.76).

Conclusions: Complex social-structural inequities are associated with housing instability. In addition to meeting basic needs for living, future housing solutions for WLWH and other marginalized populations need to expand gender-responsive and trauma- and violence-informed principles, low-barrier requirements for membership, and strong connections with supportive harm reduction practices.

106

The association between baseline body mass index (BMI) and viral suppression and rebound among people living with HIV: the Canadian HIV Observational Cohort (CANOC).

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Background: The association between body mass index (BMI) and viral load (VL) suppression and rebound among people living with HIV (PLHIV) remains inconclusive; however studies suggest individuals with higher BMI experience better virological response and that sex may be a potential effect modifier. This study explored the association of baseline BMI with time to VL suppression and rebound among PLHIV by sex in the Canadian HIV Observational Cohort (CANOC).

Methods: Data were obtained from CANOC which includes treatment-naïve individuals initiating cART between 2000-2016. Participants ≥18 years with ≥12 months clinical follow-up, baseline CD4 and VL recordings and ≥2 consecutive follow-up CD4 and VL measurements were eligible. Baseline BMI was recorded within 90-days before or after cART initiation and stratified into underweight (<18.5 kg/m2), normal (18.5-24.9 kg/m2), overweight (25-25.9 kg/m2), obese (>30 kg/m2), and no BMI recording. VL suppression was defined as ≥2 consecutive VL measures <200copies/mL. VL rebound was defined as ≥2 consecutive VL measures >200copies/mL after VL suppression. Multivariable Cox proportional hazards modelling examined the associations overall and by sex and adjusted hazard ratio (aHR) and 95% confidence intervals (CI) were reported.

Results: Of the 11,238 eligible participants (83% men), 2% were underweight, 17% were normal, 9% were overweight, 3% were obese and 70% had no BMI recording. Compared to women with normal BMI, obese women (aHR1.34,95%CI:1.05,1.70) were more likely to achieve VL suppression, however no association was seen among men. Overweight men were less likely to experience VL rebound compared to men with normal BMI (aHR0.69,95%CI:0.55,0.86).

Conclusions: We found that obese women were more likely to achieve VL Suppression compared to women with a normal baseline BMI, but this association was not seen among men, suggesting sex is an effect modifier. However, BMI is likely one element in a multitude of inter-related factors that can influence virologic response.

107

Homelessness associated with Viral Load Suppression Failure and Reduced Access to Healthcare and Poor HIV Health Outcomes among Women Living with HIV in Metro Vancouver, Canada

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Background: Homelessness has been associated with limited access to HIV care and broader healthcare services in many populations. Limited research with cisgender (cis) and transgender (trans) WLWH has studied housing needs and its impact on healthcare access. Our study aims to examine the relationship between housing status and the HIV care continuum and broader healthcare access.

Methods: Data for this study came from a longitudinal community-based open cohort of cis and trans WLWH aged 14+. Outcomes measured in the last six months included: currently taking antiretroviral (ART), sub-optimal adherence (<95%), detectable viral load (>50 copies/mL), and being unable to access primary and dental care. 'Housing status' was the four-category explanatory variable aligned with the Canadian Definitions of Homelessness (CDOH). Bivariate and multivariable logistic regression models using generalized estimating equations (GEE) for repeated measures over time yielded adjusted odds ratios (AOR) and 95% confidence intervals [95%CIs] for the associations between housing and health outcomes.

Results: Our study included 336 participants (1930 observations) over ten years (2010-2019) of follow-up with disproportionate numbers of Indigenous (57%) and other racialized women (9%). At baseline, 82% reported currently on ART; among participants taking ART, 51% reported sub-optimal adherence and had detectable viral load, respectively; 16% were unable to access primary care; 26% were unable to access dental care. In multivariable analysis, being unsheltered was associated with not taking ART (AOR=2.11, 95%CI:1.33-3.36)), detectable viral load (AOR=1.86, 95%CI:1.29-2.67), and being unable to access primary care (AOR=2.06, 95%CI:1.20-3.55) and dental care (AOR=1.61, 95%CI:1.02-2.54).

Conclusions: Homelessness has substantial impacts on HIV outcomes and access to healthcare. Women's healthcare models need to address social determinants of health, including housing, practice trauma- and violence-informed principles, and reduce structural inequities, in order to fulfill the basic right to housing and healthcare for all and improve women's overall health and HIV outcomes.

136

Attitudes toward time-based and behaviour-based blood donation policies among HIV-negative gay, bisexual, and other men who have sex with men in Montreal, Toronto and Vancouver

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Objectives: The recently changed Canadian policy as of May 2019 is to defer GBM from donating blood if they have engaged in oral or anal sex with another man in the past 3 months. We examined attitudes among HIV-negative GBM toward time-deferral based policies and potential behaviour-based policies.

Methods: The Engage cohort study used respondent-driven sampling (RDS) to recruit GBM who reported sex with another man in the past six months in the three largest cities in Canada: Montreal, Toronto, and Vancouver. These data are from the 1-yr follow-up (May 2019-Dec 2020) of Engage with HIV-negative GBM (n=1062), where questions were asked about the acceptability of blood donation policy options/alternates, and willingness to comply with each policy.

Results: Although 69.5% of HIV-negative GBM would comply with a 3-month blood donation deferral policy, only 9.9% of GBM would donate blood under the current time-based deferral. Only 20.3% of men agreed that the new 3-month deferral policy was acceptable and only 9.9% agreed that they would be willing to abstain from sexual activity for 3 months in order to donate blood. Half (52.6%) agreed that sexually active HIV-negative men on PrEP should be eligible to donate blood. Approximately 37.8% agreed that HIV-negative men who have sex with HIV-positive partners with an undetectable viral load should be eligible to donate blood. A smaller proportion (15.3%) agreed that men living with HIV who have an undetectable viral load should be able to donate blood.

Conclusion: Our quantitative findings extend previous qualitative research showing low acceptability and interest in donating blood under the current 3-month deferral policy. Health Canada should consider adopting behaviour-based policies that do not require complete abstinence from sexual activity, such as policies that already exist in the UK and Italy.

141

Evaluating Experiences of HIV-related Stigma Among People Living with HIV Diagnosed in Different Treatment Eras in British Columbia, Canada

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Background: Experiences of stigma among people living with HIV (PLWH) are pervasive; however, there is limited data on whether experiences change with age and HIV lived experience. We sought to examine whether PLWH diagnosed in different treatment eras experience varying levels of self-reported HIV-related stigma.

Methods: Between January 2016 to September 2018, we used purposive sampling to enrol PLWH aged ≥19 years across British Columbia (BC) into the STOP HIV/AIDS Program Evaluation (SHAPE) study. Participants completed an HIV-related health questionnaire which included the 10-item Berger HIV Stigma Scale, with higher scores indicating higher perceived HIV stigma. We conducted bivariate analyses between key sociodemographic characteristics and HIV stigma. Multivariable linear regression modelled the association between year of diagnosis by treatment era (defined as pre-1996, 1996-1999, 2000-2009, and 2010-present) and mean HIV stigma score.

Results: We enrolled 644 participants with a median age at enrolment of 50 years (Q1-Q3:42-56). The median age at diagnosis was 34 years (Q1-Q3:27-40) with 37.4% (n=241) diagnosed before the year 2000. The mean HIV stigma scores (Q1-Q3:13-25; range:0-40) stratified by treatment era was: 17.6 (pre-1996), 19.2 (1996-1999), 19.9 (2000-2009), 19.1 (2010-present). In unadjusted analyses, year of HIV diagnosis by HAART era was associated with higher HIV stigma scores (p-value=0.03) but was not associated in adjusted analyses controlling for age, gender, HIV risk group, ethnicity, and ever having a mental health disorder diagnosis.

Conclusion: We did not find that HIV stigma scores varied by era of treatment engagement, suggesting that HIV-related stigma remains a problem even for PLWH diagnosed in recent years. However, our results may be confounded by the relative older age of this cohort, who may have additional protective factors that contribute to living longer with HIV.

148

Prevalence of HIV and sexually transmitted and bloodborne infections, and related preventive and risk behaviours, among gay, bisexual and other MSM in Montreal, Toronto and Vancouver.

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Objectives: The last national biobehavioural surveillance study of GBM was in 2010. We measured prevalent HIV and other STBBI and documented related preventive and risk behaviours in Canada's three largest metropolitan areas.

Methods: The Engage cohort study used respondent-driven sampling (RDS) to recruit GBM aged 16 years or older who reported sex with another man in the past six months. At baseline, we examined RDS-II adjusted distributions of laboratory-confirmed HIV and other STBBIs, and related behaviours, with a focus on city differences. We made pairwise comparisons between cities, using nonparametric tests considering unequal variances and sample sizes across cities.

Results: A total of 2,449 GBM were recruited from February 2017-August 2019. HIV prevalence was lower in Montreal (14.2%) than in Toronto (22.2%) or Vancouver (20.4%). While history of syphilis infection was similar across cities (14-16%), the occurrence of other STBBIs varied. Vancouver had more HIV-negative/unknown participants (18.6%) who reported never being HIV tested compared with Toronto (12.9%) or Montreal (11.5%). Both Montreal (74.9%) and Vancouver (78.8%) had higher proportions of men who had tested for another STBBI in the past six months compared with Toronto (67.4%). Vancouver had a higher proportion of men who used Pre-Exposure Prophylaxis (PrEP) in the past six months (18.9%) than Toronto (11.1%) or Montreal (9.6%).

Conclusion:
The three largest cities of Canada differed in HIV and some other STBBI prevalence, STBBI testing, and PrEP use among GBM. Our findings also suggest the need for scale-up of both PrEP and STI testing among GBM in Canada.

201

Examining whether the Social Determinants of Health Predict Engagement in Exercise in People Living with HIV

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Background: Physical Activity can mitigate disability and improve health outcomes for people living with HIV. The social determinants of health (SDOH) include factors that may influence health status and engagement in physical activity. However, it is unclear how SDOH may influence engagement in exercise among people living with HIV.

Purpose & objectives: The purpose of this study is to examine the nature and extent of engagement in exercise among people living with HIV. Specific objectives are 1) to describe the nature and extent of engagement in exercise; and 2) to examine whether SDOH predicts engagement in exercise among adults living with HIV enrolled in a 25-week community-based exercise (CBE) intervention in Toronto.

Methods: We will conduct a quantitative longitudinal study using data collected with adults living with HIV who participated in a 25-week CBE intervention. Participants were asked to engage in a combination of aerobic, resistive, balance and flexibility exercise, 90 mins, 3 times per week, supervised weekly by fitness instructors at the Toronto YMCA. Using the Public Health Agency SDOH Framework, we identified 10 out of 12 demographic characteristics measured in our study that may be used as proxies for social determinants of health. For objective 1, we will descriptively analyze: i) nature (type: aerobic, resistive, balance, flexibility) and ii) extent (frequency, time, intensity, progression) of exercise across the intervention as measured by self-reported exercise logs and weekly coaching logs and YMCA usage. For objective 2, 'engagement in exercise' will be defined as attending ≥ 72% (18/25) weekly sessions. We will conduct univariate analyses between engagement in exercise and each determinant followed by a logistic regression model to determine predictors of engagement in exercise.

Implications: Results will help to establish a better understanding of the role of SDOH on engagement in exercise among people living with HIV.

114

Trends in estimated HIV incidence among gay, bisexual and other men who have sex with men, people who inject drugs and heterosexuals, Canada

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Background: Estimating trends in national HIV incidence among key populations can provide a more accurate picture of the epidemic and help to tailor the development and evaluation of prevention programs.

Methods: The estimated annual number of new HIV infections among gay, bisexual and other men who have sex with men (gbMSM), people who inject drugs (PWID) and heterosexuals was estimated using the bespoke Canadian HIV modelling approach. The model back-calculates HIV incidence from HIV surveillance data on diagnosed cases from each jurisdiction across Canada and from data on the HIV testing behaviour of these populations.

Results: Annual estimated new HIV infections among gbMSM increased sharply from the beginning of the HIV epidemic, peaking in 1983 (3,870). After a steady decrease down to approximately 750 infections per year between 1994 and 1998, the average number of estimated new infections among gbMSM ranged between 1,000 and 1,100 per year from 2000 to 2018. Annual new HIV infections among PWID increased moderately from the beginning of the epidemic and peaked in 1993 (841), followed by a decrease to 241 in 2013. However, since 2013, the number of new infections among PWID has increased by 55.3% (372 in 2018). Annual estimated new HIV infections among heterosexuals increased slowly from the beginning of the epidemic and peaked in 2003 (945), then decreased until 2013 (500). The number of new HIV infections among heterosexuals increased by 52.5% since 2013 (761 in 2018).

Conclusion: The historical trends of annual estimated HIV infections among key populations varied, showing peaks at different times during Canada's HIV epidemic. In recent years, the estimated number of new HIV infections has been relatively stable among gbMSM but has increased among PWID and heterosexuals. These estimates can provide evidence to more effectively monitor the HIV epidemic in Canada and to guide prevention programs.

116

Estimated HIV incidence and prevalence in eight Canadian provinces, 2018

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Understanding HIV incidence and prevalence by jurisdiction allows public health and policy makers to monitor trends and inform planning of HIV prevention and care services.

The Canadian HIV model generated estimates of annual HIV incidence for each jurisdiction. HIV prevalence was calculated as cumulative incidence plus diagnosed cases who moved into a jurisdiction minus diagnosed cases who moved out of a jurisdiction and estimated total mortality among people living with HIV (PLHIV). Each jurisdiction provided input data for the model (surveillance data, death counts, and migration estimates. Data from Saskatchewan, Alberta, and the Territories were not included.

The 2018 estimated HIV incidence rates ranged from 2.4 per 100,000 (Atlantic Provinces) to 8.1 per 100,000 (Quebec). Manitoba (6.0 per 100,000) and Ontario (5.8 per 100,000) had similar rates compared to the national level (6.0 per 100,000), while British Columbia's (BC) rate was lower, at 3.3/100,000. The highest proportion of incident cases (47.6%) in Manitoba was attributed to heterosexual sex. In contrast, gay, bisexual and other men who have sex with men (gbMSM) made up the majority of incident cases (50.8% to 64.2%) in the remaining provinces.

Estimated HIV prevalence varied across the country: Quebec and BC were the highest (202 and 195 per 100,000, respectively), while Ontario (164 per 100,000) had a rate similar to the national level (167 per 100,000). Manitoba's prevalence was lower than the national rate (138 per 100,000), and the Atlantic provinces were the lowest at 60 per 100,000. Approximately half of PLHIV (51.0% to 54.4%) in most provinces were gbMSM, while over half of PLHIV (59.5%) in Manitoba were among people who reported heterosexual sex only.

HIV incidence and prevalence, including among key populations, varied by jurisdiction across Canada. These estimates help guide prevention programs and monitor progress towards ending the impact of HIV in Canada.

207

Trends in Combination Antiretroviral Therapy Use and Treatment Response from 2000 to 2016 in the Canadian HIV Observational Cohort Collaboration (CANOC)

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Introduction: Changes in combination antiretroviral therapy (cART) treatment guidelines have occurred over time. By 2015, consensus was reached: all people living with HIV (PLWH) should be prescribed cART regardless of CD4 count. This study aimed to examine trends in cART utilization, CD4 cell counts, and viral loads among PLWH from 2000 to 2016.

Methods: PLWH were included in CANOC if (1) aged ≥18 years on naïve initiation of cART on or after January 1, 2000, (2) initiated cART consisting of 3+ antiretroviral medications, (3) resided in Canada, and (4) at least one plasma viral load and CD4 count within one year of initiating cART. Baseline CD4 counts were categorized as <100, 100-299, 300-500, >500 cells/mm3 yearly and by province. Similarly, viral load was categorized as supressed (<50 copies/mL), low (≥50 and <200 copies/mL), and high detectable (≥200 copies/mL) yearly and by province. cART regimen type was classified by third agent and reported yearly and by province.

Results: All 13 040 CANOC participants were included. Overall, 27% and 42% of PLWH had baseline CD4 <100 and 100-299 cells/mm3, respectively, in 2000 compared to 13% and 26% in 2016. In terms of mean viral load, 11% and 22% of PLWH were suppressed and low in 2000, respectively, compared to 83% and 6% in 2016. From 2000-2003 and 2014-2015, non-nucleoside reverse transcriptase inhibitors was the most common 3rd agent class whereas protease inhibitors were most common from 2004-2012. In 2016, integrase inhibitors became the most common. Similar trends were seen among individuals living in British Columbia, Ontario, and Quebec.

Conclusion: Substantial improvements in immunological and virologic responses have been observed among CANOC participants from 2000 to 2016, in line with evolving guidelines. Also in line with recommendations and the release of new agents, 3rd agent cART class evolved over time.

103

Meaningful inclusion and training of Peer Research Associates by, with, and for women living with HIV: Teachings from the BC CARMA-CHIWOS Collaboration Study.

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Background: Activism by people living with HIV has established calls for meaningful inclusion in research and programming that impacts their lives. Few studies describe the process of meaningful engagement, especially within clinical research. We discuss how we hired, trained, and continue to support women living with HIV (WLWH) as Peer Research Associates (PRAs) in the BC CARMA-CHIWOS Collaboration (BCC3) Study, and how we are engaging WLWH through a peer-mentorship model.

Process and Lessons Learned: We hired five WLWH as PRAs, with diverse lived and living experiences and expertise. Some women had previous research experience, while others did not. Multi-modal experiential training was held virtually between July–November 2020. An Indigenous Elder opened and guided sessions in a Good Way. Training included survey administration, research ethics and methods, scientific curricula related to hormones and aging, data quality, self-care, and well-being. PRA's strengths and expertise were emphasized as they led training sessions and activities, engaged in paid study opportunities beyond survey administration, and were supported to set personal goals throughout and beyond training.

Tailoring training to the goals, voices, and priorities of PRAs provided transformational learning opportunities for the entire research team. This included expanding the definition of the PRA role, and mirroring the diversity of women's lives, needs, and experiences throughout and beyond the training. Challenges included virtually engaging women during a pandemic; meaningful engagement with complex scientific concepts; and creating a curriculum built upon and responsive to the varying expertise of PRAs.

Recommendations: Research teams must be responsive to the goals of PRAs; incorporate opportunities for bidirectional learning and knowledge sharing; dedicate time for team relationship building and trust; leverage existing community-based research training materials; and create a research environment that supports WLWH to share their expertise and experiences, ask questions, interrogate study practices, and mentor other team members.

230

Indétectable = Intransmissible (I=I): L'indétectabilité de la charge virale telle que perçue par des personnes vivant avec le VIH au Québec

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Problématique: Le message de santé publique « Indétectable= Intransmissible » (I=I) réfère au fait que les personnes vivant avec le VIH (pvVIH) sous médication et qui maintiennent une charge virale supprimée ne transmettent pas le VIH à leurs partenaires sexuels. Or, le niveau de confiance des pvVIH envers ce message est variable, et toutes n'accordent pas la même signification à l'indétectabilité dans la transmission du virus. Cette étude menée en 2020 a ainsi pour objectif de décrire, de comprendre et d'analyser plus formellement l'expérience de l'indétectabilité à l'ère d'I=I de pvVIH québécoises dans le but de mieux comprendre leur réception de ce message.

Méthode: Un devis qualitatif de théorisation ancré a permis d'informer empiriquement l'expérience du message I=I et de l'indétectabilité des participant·es. Seize pvVIH recrutées par références communautaires ont partagé leurs expériences avec la chercheuse principale dans le cadre d'une entrevue en visioconférence semi-dirigée. Les entrevues ont été retranscrites intégralement, codées et analysées afin de faire émerger des thématiques relatives aux phénomènes étudiés.

Résultats: Trois aspects émergent des analyses préliminaires. D'abord, les participant·es construisent en grande partie leurs compréhensions du message I=I à l'aide de leurs expériences communautaires. Dans l'ensemble, les participant·es n'ont pas l'impression que le grand public est bien renseigné sur les réalités de la vie avec le VIH, et la tâche d'informer ce public leur revient souvent. Finalement, si les participant·es se disent rassuré·es par le message I=I, iels partagent une inquiétude certaine quant à l'avenir de l'étiquette préventive au sein de leurs groupes sexuels.

Discussion: Les analyses finales permettront une compréhension qualitative de la réception et de l'appropriation de I=I au Québec, près de 10 ans après les premières discussions scientifiques et communautaires sur le sujet, et alors qu'il existe toujours des écarts importants entre réalité scientifique et perceptions du grand public sur le VIH.

164

Riposte communautaire québécoise au VIH/sida: le processus de constitution d'une stratégie de riposte collaborative et concertée pour l'atteinte les cibles de l'ONUSIDA fixées pour 2025

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Contexte : La Riposte communautaire québécoise au VIH/sida s'inscrit dans le contexte d'intensification des cibles mondiales de l'ONUSIDA à atteindre pour 2025, dans le but de mettre fin à l'épidémie de sida d'ici 2030. Riposte découle des états généraux de la COCQ-SIDA, effectués en 2018, où les membres avaient à dégager les actions prioritaires à mettre en place. Cela a fait ressortir le besoin de créer une stratégie de riposte nationale collaborative et concertée pour mettre en commun les voix du secteur communautaire québécois en lutte VIH/sida et de s'approprier les cibles de l'ONUSIDA à atteindre pour 2025.

Processus : Démarré en septembre 2020, Riposte s'organise autour d'une consultation nationale utilisant trois méthodes, soit, (1) un sondage utilisant la méthode DELPHI en 2 tours pour consulter les 33 organismes-membres de la COCQ-SIDA; (2) six focus groups (n=30) pour consulter les personnes vivant avec le VIH et les personnes issues des populations clés; et (3) des entretiens semi-dirigés (n=4) pour consulter les partenaires de santé publique.

Discussion: Les états généraux de la COCQ-SIDA ont fait ressortir les besoins prédominants des organismes communautaires de lutte contre le VIH/sida de consolider leur réseau et de mettre en commun leurs efforts qui font partie intégrante de la mission de la Coalition. Les membres ont rappelé la grande nécessité de s'entraider, de revendiquer et de se former. Cet exercice a démontré la nécessité du regroupement d'organisme communautaire de faire une pause pour porter une réflexion sur leurs actions afin de mieux catalyser leurs efforts pour mettre fin à l'épidémie. Les données de la consultation actuelle vont permettre de construire une stratégie de riposte collaborative et concertée à l'échelle nationale qui servira de ligne directrice au secteur communautaire québécois en lutte VIH/sida. Ces données sont attendues dans les prochains mois et seront ajoutées à notre communication.

91

Sexuality Disclosure and HIV/STBBI Testing among Two-Spirit, Gay, Bisexual, & Queer Men in Manitoba

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Background: This study examined the relationship between the disclosure of sexual identity to healthcare providers and HIV or sexually transmitted and blood-borne (STBBI) testing among Two-Spirit, gay, bisexual, queer (2SGBQ+) men in Manitoba.

Methods: Data were drawn from a community-based, Manitoba-wide online survey of 2SGBQ+ men in 2019. Participants were asked if they talked openly about their sexual orientation with their healthcare providers. To assess HIV/STBBI testing, we asked participants if they had ever been tested for HIV/STBBI (tested vs. not). Chi-square and logistic regression analyses were used to examine the relationship between the disclosure of sexual identity to healthcare providers, socio-demographics (age, ethnicity, income, and education), and lifetime HIV & STBBI testing (outcome variable).

Results: Among 304 participants: the mean age was 32 years (SD=8.4, range=18-80); 56.4% were White/Caucasian, 18.5% Indigenous, and 25.1% were men of colour; 25% reported incomes less than $30,000; 19.4% and 27.3% reported never being tested for HIV or any STBBI, respectively; and 25.5% did not talk openly about their sexual orientation with healthcare providers. Younger people were more likely to be tested (AOR=0.93,95%CI:0.88-0.98). Participants with highest household incomes ($100,000 versus <$30,000) were more likely to test for both HIV (AOR=3.89,95%CI:1.62-33.34) and STBBI (AOR=4.66,95%CI:1.59-13.68). No other socio-demographics emerged as significant. We also found that disclosure of sexual identity to healthcare providers versus not was positively associated with HIV (AOR=9.34; 95%CI:1.09–13.92) and STBBI (AOR=5.31; 95%CI:2.69–10.47) testing.

Conclusion: Our findings indicate a strong relationship between the disclosure of sexual identity to healthcare providers and HIV/STBBI testing. Future research needs to understand the relationship between HIV and STBBI testing uptake and healthcare settings conducive to 2SGBQ+ men's disclosure of their sexuality and sexual practices.

175

Acts of allyship working in partnership with the Métis community to pilot Dried Blood Spot Testing for HIV, HCV, HBV, and syphilis in Alberta

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Background: As part of the DRUM & SASH implementation science team grant, we, a multi-cultural team, are working collaboratively and in allyship with the Métis community in Alberta to address HIV, HCV, STBBI and related mental health issues. As allies, we aim to reduce inequities experienced by the Métis community by supporting community-led initiatives grounded in Métis ways of knowing and doing. Our recent engagement in a multi-partner dried blood spot testing (DBST) pilot for HIV, HCV, HBV, and syphilis with Métis communities in Alberta provided an opportunity to reflect on allyship within the context of our research.

Methods: Using a case study approach, we reflected on our experiences planning, implementing, and evaluating this DBST pilot initiative and considered additional data from interviews with three DBST providers, meeting minutes, observational notes, and notes from team debriefs for themes related to allyship.

Results: We identified seven themes related to acts of allyship within this collaborative endeavor. Acts of allyship demonstrated by individuals from partnered organizations included, 1) establishing regular communication with community representatives; 2) being open and listening without judgement in order to reduce tensions; 3) developing a positive working relationship; 4) decision making (wherever possible) by those who represented the community; 5) acknowledging past and present poor relationships with the Métis community and the impacts of colonialism; 6) acknowledging the right of Indigenous communities to self-determine their health services; and 7) challenging the status quo.

Conclusion: These acts of allyship provide tangible lessons learned as well as guidance to future collaborators, and suggest promising practices for building respectful relationships as allies with Métis communities. Respectful relationships demonstrating allyship between health service providers, researchers, and policy makers and Métis communities are essential to fostering and supporting Indigenous community-led interventions targeting HIV, HCV and other STBBI.

184

Associations between area of residence, openness, STI/HIV testing, and PrEP use among gay, bisexual and other men who have sex with men living in Montreal, Toronto and Vancouver

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Background: Gay, bisexual, and other men who have sex with men (GBM) living in areas further from urban core face challenges in accessing HIV/STI prevention, as services are concentrated in gay neighbourhoods located within urban cores. A lack of general openness about one's sexual orientation and openness to one's healthcare providers are factors that may contribute to this disparity. This analysis examined associations between area of residence, openness, and STI testing, HIV testing, and PrEP use among a sample of urban Canadian GBM.

Methods: Using baseline data from Engage (N=2449; 440 self-reported living with HIV), a respondent-driven sampling (RDS) cohort study, we examined the relative contribution of area of residence (based on postal code: within urban-core vs. not), general openness (out to all) and openness-with-providers on STI testing (in past 6 months:P6M), HIV testing (P6M) and PrEP use (P6M), separately. We fit a series of generalized estimating equation models accounting for age, race/ethnicity, income, marital status, perceived HIV risk, city and recruitment related clustering.

Results: In the non-RDS-adjusted (considering unlinked recruitment chains) three-city combined sample (Mage=36; 71%White) 62% reported a STI test, and among HIV-negative GBM, 60% reported an HIV test and 18% reported PrEP use. Main effect models indicated area of residence, general-openness, and openness-with-provider were independently related with each outcome (all p <.05). Final adjusted models with three main effects and two interaction terms (residenceXgeneral-openness and residenceXopenness-with-provider) indicated significant effects of openness-with-providers on STI testing (RR=1.17,95%CI:1.02-1.34; p=.02), HIV testing (RR=1.27,95%CI:1.10-1.48; p=.001) and PrEP use (RR=1.68,95%CI:1.13-2.50; p=.01), unlike area of residence and general openness (all p >.05).

Conclusion: Openness and comfort with one's healthcare providers are significantly associated with recent STI testing, HIV testing, and PrEP over area of residence. GBM and provider interventions to facilitate disclosing one's sexual orientation may improve sexual health care among Canadian GBM.

213

Social Determinants of Methamphetamine Use Among Gay, Bisexual, and Queer Men Living with HIV

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Background: Gay, bisexual, and other men who have sex with men (GBM) living with HIV (GBMLWH) report more methamphetamine use compared with HIV-negative GBM. Methamphetamine use is consistently associated with adverse sexual health outcomes. However, the drivers of methamphetamine use, such as heterosexist discrimination, internalized stigma, psychological distress, and individual coping styles (e.g., cognitive escape), and how they interrelate to increase GBM's likelihood of using methamphetamine remain understudied. We examined these potential pathways to predict methamphetamine use in the past six months.

Methods: From the baseline sample of the Engage Cohort Study (2,449 GBM recruited between 02/2017 and 08/2019 in Montreal, Toronto, and Vancouver), there were 355 GBMLWH with complete data. Of these men, 35% reported methamphetamine use in the past six months (versus 6% of HIV-negative GBM). A structural equation model was fit using unweighted least squares estimation with robust (Huber-White) standard errors and a Satorra-Bentler adjusted test statistic to examine correlates of recent methamphetamine use (yes/no).

Results: The hypothesized model (see Figure) was a good fit for the data (CFI=.977, RMSEA=.02 (90%CI [.00,.04]), SRMR=.07). Heterosexist discrimination was directly and indirectly (through proximal stress) associated with psychological distress; childhood sexual abuse was directly associated with psychological distress. In turn, psychological distress was associated with methamphetamine use in the past six months indirectly, through sexual compulsivity and escape motives.

Conclusion: These data support a model in which GBMLWH may be using methamphetamine to escape stigma-related psychological distress. Interventions supporting GBMLWH who use methamphetamine should address heterosexist discrimination and psychological distress.

247

“Undetectability is a fallacy…it is not for Black Bodies”: Inequities, Structural Violence and the Uncertainty of Undetectability for Black communities living with HIV in Ontario, Canada.

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Introduction: Black communities are structurally disadvantaged and bear a disproportionate burden of HIV despite biomedical advances in HIV treatment. Studies demonstrate that people living with HIV on antiretroviral treatment can achieve viral suppression or undetectability, which is fundamental for optimizing health outcomes, decreasing HIV-related mortality and morbidity and preventing HIV transmission. This work problematizes how efforts to manage HIV/AIDS ignore inequities shaping the social world of Black communities.

Method: The study employed Institutional Ethnography as a method of inquiry to conduct 30 in-depth interviews with ACB migrants living with HIV in Toronto and 20 in-depth interviews with health care providers and policy/decision makers involved in the delivering of HIV care in Toronto. Textual analysis of regulations, policies, legislations, and guiding principles connected to HIV care and healthcare in general were also conducted. Mapping of institutional orders s and social relations that organize and coordinate HIV healthcare and treatment was done.

Result: Findings reveal that structural violence embedded in Canada’s social fabric, including legislative frameworks, policies, and institutional practices, produces inequities. Structural determinants and social determinants including poverty, homelessness, housing instability, food insecurity, unemployment, stigma and discrimination, anti-Black racism, comorbidities and bureaucratic institutional practices such as long wait times, difficulty finding a doctor shape Black people’s experiences and constrain their work of retention in care, adherence to ART and achieving and maintaining undetectability, leading to violation of their right to health. These findings indicate that HIV healthcare discourses and practices create hierarchy, where privileged individuals who achieve undetectability are considered good people. Black communities are reduced to a stigmatized and impoverished viral underclass, producing another layer of anti-Black racism and HIV stigma.

Conclusion: Effective management and eradication of HIV/AIDS require the implementation of policies and institutional practices that address structural inequities and social determinants of health among Black communities.

251

The Care Collective: Increasing HIV testing among African, Caribbean and Black (ACB) women by encouraging the integration of testing into self-care practices

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Objectives/Background: African, Caribbean and Black (ACB) people make up 4.7% of Ontario's population, yet they account for 27% of first-time HIV diagnoses. And more than 60% of all women newly diagnosed with HIV in Ontario are ACB. These numbers highlight the dangerous interplay between health outcomes and social determinants of health, including anti-Black racism. The Care Collective is a campaign whose objective is to encourage ACB women to know their HIV status by incorporating regular testing into their self-care practices.

Methods: To determine the campaign's direction:
- Focus groups, interviews, stakeholder discussions
- Online surveys with ACB women, service providers, community members.

COVID-19 pivot: Originally conceptualized to be implemented in-person, by taking conversations about HIV and HIV testing into numerous wellness and self-care spaces, the Campaign had to pivot. Templates on creating successful virtual The Care Collective events have been produced, model events have been shared and the arrival of HIV self-tests has meant that virtual events can have the key elements of a successful and impactful event.

Currently: The campaign has been championed by "influencers", is enjoying an active social media presence and continues to come to life through virtual events organized mainly by ACB women for ACB women.

Results: Survey data indicated that 57% of ACB women had never had an HIV test. Given the uptake, the campaign is well-placed to increase HIV knowledge, reduce stigma and increase testing among women. Women involved in campaign development and launch highlighted the far-reaching benefits of centering ACB women in HIV conversations, while promoting holistic health.

Conclusion: The Care Collective is on track to have a significant impact on HIV testing rates for ACB women in Ontario, generate a necessary shift in how HIV is discussed, and highlight the need for greater resources and focus on ACB women in HIV programming.

44

Working together: Allies in researching gender and combination antiretroviral therapy treatment change

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Background: This is a story of working collaboratively as reflexive colleagues. Claudette, an Indigenous Elder, engaged with community and recognized peers experiencing similar adverse side effects. Research has also shown gender-related differences in initiation of combination antiretroviral therapy (cART) and regimen changes. We aimed to compare women and transgender individuals to males and identify if they experienced differences in cART regimen changes.

Methods: We used data from the Canadian HIV Observational Cohort (CANOC) including treatment-naïve individuals initiating cART between 2000-2016. Participants with known gender and ≥18-months follow-up were eligible. cART regimen change was defined as any regimen change (excluding brand/generic changes). Treatment change artifacts were minimized by excluding regimen changes that lasted <30 days. Poisson regression models examined the number of cART changes and the relative risk in women and transgender individuals compared to men, adjusting for era of cART initiation, third agent in cART, province, rurality, co-infection with Hepatitis C, baseline CD4 count, baseline viral load, viral suppression and rebound, and age at first cART initiation. Adjusted incidence rate ratio (aIRR) and 95% confidence intervals (CI) were reported.

Results: Of the 10,555 participants (8,728 men, 1,771 women and 56 transgender) women and transgender individuals experienced higher crude numbers of cART changes (1.95 and 2.09 mean changes, respectively) compared to men (1.63 mean changes). Compared to men, women (aIRR1.21, 95%CI:1.16,1.25) and transgender individuals (aIRR1.23, 95%CI:1.03,1.48) experienced significantly higher cART change.

Conclusion: Our team combined positive living experiences with epidemiological methods. It was a long and winding journey, with bumps along the way, to develop an approach to use data from CANOC in a good way. We found truth and relevance to this question as there were significant differences in the rate of cART change between genders. We demonstrated the importance of a gender-based lens in assessing patterns of cART changes.

51

Examining Inter- and Intra- Organizational Dynamics Supporting Task-shifting Opportunities in Community-based HIV and Sexual Health Services for GBM

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Background: Two-spirit, gay, bisexual and other trans and cisgender men who have sex with men (GBM) in Canada continue to experience multiple barriers to achieving sexual, physical, and emotional well-being. HIV rates within this group are among the highest in the country, and GBM often experience higher rates of mental health difficulties and substance use and misuse than the general population. Community-based interventions, such as those provided by AIDS Service Organizations (ASOs), are vital to providing highly effective services for GBM, but often lack the requisite resources to provide pseudo-clinical services (e.g., PrEP, rapid HIV testing, or counselling) that are essential for responding to health inequities. Addressing this issue, the following study examined the potential evidence-based role of task-shifting as a method of ensuring that community workers are empowered to provide a wide range of care, therefore reducing the burden on clinicians and increasing accessibility to essential sexual health and health services. This analysis focused on inter- and intra- organizational needs and factors that serve as necessary supports for engagement in task-shifting activities within the context of community-based services for GBM.

Methods: Using community-based research approaches, a four-phase, multi-year implementation study was conducted, including interviews with 31 clinicians and community workers serving GBM in Toronto. A thematic analysis of the interview data was conducted to identify organizational factors supporting task-shifting in community-based services.

Results: Inter-organizational factors included effective referral processes, inter-organizational trust, strong communication, mutual reciprocity, accountability, and knowledge sharing, while intra-organizational factors included financial incentives, resource sharing, role flexibility, openness to change, engagement in evaluation, and use of evidence.

Implications: Findings will be applied to the development of effective partnerships between organizations, as well as within organizational units. Specific implications for the management of ASOs will also be discussed, including linkages to leadership, organizational culture, and strategic resource management.

76

Knowledge into Action: Reducing STIgma, Improving Health for African Newcomers from HIV endemic countries

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Knowledge into Action (KiA) project is funded by the Public Health Agency of Canada (PHAC) as one of the projects to be supported through the HIV and Hepatitis C Community Action Fund (CAF), from April 2017 to March 2022.

Under the Sexuality Education Resource Centre MB (SERC), (KiA) project works with African newcomers and service providers in Winnipeg, focusing on providing information on STBBI prevention, treatment and stigma reduction. This project provides information sessions to African newcomer community members, youth and multicultural leaders (Objective 1), and capacity-building sessions to community leaders/resource people (Objective 2) and service providers (Objective 3).

This presentation will share experiences and findings from the first three years of work with community members, leaderships and community resource people. As a result of the community-based approach adopted in this project, community members and leaders are involved and perform key roles in the organization of all community sessions, provided in different languages.

These workshops are evaluated for the continuous improvement of the project through a comprehensive evaluation plan with SMART objectives, short- and medium-term outcomes and predefined indicators and targets. Evidence indicates that the project has been effective in reaching the short-term outcomes expected in the three Objectives, since the priority populations have consistently demonstrated overall increased knowledge or capacity according to the predefined indicators. Findings also demonstrate that the project has been successful in reaching its expected medium-term outcomes: most participants who joined follow-up evaluation activities reported that information has been useful in their lives and/or communities. We will share learnings presenting qualitative and quantitative data.

93

Finding the Balance: Embracing the Two-Eyed Seeing Approach to Understand What Cultural Safety in Care Means to Older Adults Living with HIV

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Background: Cultural safety in healthcare is most often associated with care provision for Indigenous and ethnic communities. Some argue that cultural safety should be extended to populations such as people who use substances (PWUS) and LGBTQ2S+ individuals - communities that are also marginalized by social-structural inequities. These identities often intersect with HIV, making cultural safety an important concept in HIV care.

Methods: The study objective was to understand barriers and facilitators to home and community care (HCC) experienced by older adults (>50 years) living with HIV (OALHIV) in British Columbia. Peer Research Associates and the study coordinator co-conducted 24 qualitative interviews with OALHIV, which included questions on cultural safety. The interviews were professionally transcribed, and then coded and analyzed using NVivo 12.0 software.

Results: The majority of participants self-identified with one or more communities marginalized by social-structural inequities (African, Indigenous, PWUS, and LQBTQ2S+). The theme of cultural safety was complex, ambivalent and intertwined with participants' identities. Some participants appreciated HCC workers' interest in their culture and willingly shared their life experiences; for others such interest was intrusive. Many Indigenous participants recalled facing discrimination because of their ethnicity or substance use, while some shared stories of HCC workers learning about Indigenous culture and respecting sacred objects. Several participants who self-identified as white reported "not having a culture" and simultaneously referred to experiences of discrimination from HCC workers based on their identities (e.g. living with HIV, LGBTQ2S+, PWUS).

Conclusions: Trust, respect and being listened to – this is how participants described cultural safety. Our findings suggest that cultural safety can serve as either a barrier or a facilitator to HCC services access for OALHIV in BC, depending on individual workers. Grounding HCC worker training and services in the concept of cultural safety may contribute to clients feeling their diverse identities are respected.

138

Innovating to remain connected while staying apart: The Thrive PRAs maintain focus on Older Adults Living with HIV in Vancouver Coastal Health despite pandemic restrictions.

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Background: Community-based research (CBR) brings invaluable peer expertise and knowledge to the table with the unique peer-to-peer connection. Thrive is a CBR project that examines the experiences with Home and Community Care (HCC) services for Older Adults Living with HIV (OALHIV) in the Vancouver Coastal Health region of British Columbia.

Approach: Four PRAs were hired and trained in CBR methods to conduct in-person qualitative interviews with OALHIV about their experience with and knowledge of HCC services. When COVID-19 pandemic restrictions came into effect in BC in March 2020, research teams had to pivot their approach to conduct recruitment and data collection virtually. As a result, seven interviews were conducted in person before the pandemic, and seventeen over the phone. All team meetings and data analysis are also done virtually. We innovated to stay connected to one another, and to participants.

Process: As peers we honed our listening skills while maintaining our focus on the stories of OALHIV and their experiences with HCC services. We became more intuitive about what participants were feeling and saying; there was a reciprocal learning. The team bonded during these COVID-19 restrictions despite the challenges and uncertainty. We edited our interview guides, and developed other projects and documents while maintaining a group consensus. We broadened our IT skills to remotely access the server to code and analyze data, and use software to schedule and participate in secure virtual meetings, NVivo software training, and study interviews. For hearing impaired participants, we submitted an ethics amendment to request nurse's support in doing phone interview.

Lessons learned: The COVID-19 pandemic impacted PRA-participant interactions, shifted roles and responsibilities within the team, and required the adoption of new skills and approaches to connecting with participants and community. The experience provided us with structure, continuity, and opportunities for community capacity bridging.

218

Users' Perspectives on the Services and Programs that a non-profit HIV/AIDS and Hepatitis C organization should Offer

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Background: AIDS Community Care Montreal-(ACCM) is a volunteer-driven community organization that provides support services and treatment information to people living with HIV/AIDS and/or hepatitis-C, and education for prevention activities in different settings. It is advised that opinions of service users should be prioritized when designing services in non-profit organizations. While there are several instruments that captures the service user's needs, little empirical approach has been undertaken to determine those needs.

Objective: Our study aims to describe the people's perspectives on the services/programs that ACCM should provide in 2021.

Methods: We have designed an online survey to be launched to our members in January-2021 and terminated by March-2021. Out of 200 members, about 70 are active. Although not all have internet access, our Drop-In center provides access to computers and internet. We anticipate reaching a sample size of 60.

We used the patient-generated index-(PGI), a measure of health-related quality-of-life that is used in health and other fields, with modified name and scoring structure (Person-Generated Index). The PGI allows people to identify, rate, and spend tokens on services/programs that are important to them.

It is a self-administered instrument and completed in 3-steps. Participants nominate up to five services/programs that should be prioritized by ACCM. Then, they rate each service/program on a scale of 0–5 (not at all important-to-extremely important) (originally 0–10). Finally, they spend 10-tokens to indicate the relative importance of each service/program. The scores from step two are multiplied by the tokens from step three. This weighted score allows an interpretation about importance and priority of the service/program.

Implication: Person-generated Index will allow us to hear our users' voices, allocate our resources based on their choices. It is anticipated that this participatory approach will impact the user's participation and satisfaction in using the services/programs and ultimately improve services/programs performance.

246

Are People Living with HIV in Canada Ready for Self-Management? A Report on Perceived Barriers and Enablers

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Introduction: People living with chronic HIV are dealing with many parallel but often competing self-management needs. Improving health-related quality of life of people living with HIV is now an ultimate goal of HIV care. Individuals' behaviour is a central part of chronic disease self-management. Fundamental to the development of tailored self-management strategies is the need to understand influences of self-management behaviours judged by the persons living the condition.

Objective: To identify perceived barriers and enablers to acting on self-management goals among HIV+ older adults in Canada.
Methods: A cross-sectional survey study was conducted with HIV+ men and women in Montreal, Toronto, and Vancouver. A total of 110 participants completed the survey and defined 421 goals in free text format. Using a deductive theory-based analysis, barriers and enablers were categorized to the components of Capability, Opportunity, Motivation, and Behaviour (COM-B) model of behaviour.

Results: Health as a general concept and managing diet and fitness were the most common self-management priorities. Difficulty breaking down routines and habits and lack of time and motivation formed majority of perceived barriers. Perceived enablers were mainly focused on improving psychological capability (establishing better habits) and physical opportunity (time management, financial plans, and seeking treatment). An overview of identified barriers and enablers is presented in Table 1.

Conclusion: HIV+ people are able to report their priorities, areas of challenges, and potential facilitators. Enabling HIV population to translate these self-management ideas into practice is of paramount importance.

253

Understanding research participation experiences among persons identifying as African, Caribbean, and Black (ACB) in British Columbia.

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Introduction: Racism is a social determinant of health and anti-racist practice is vital for public health equity. Despite ACB women comprising >35% of women living with HIV (WLWH) in Canada, we've had challenges engaging ACB communities in HIV research in British Columbia (BC). Local ACB leaders have suggested this is partly due to HIV-related stigma, mistrust, and unfamiliarity with research. Recognizing that researchers must collaborate with ACB communities to engage ACBWLWH in research, we sought to understand barriers and facilitators to research participation and to establish future research priorities for ACB communities.

Methods: We implemented an online survey by, with, and for ACB communities (aged 16+, living in BC) exploring past research experience, barriers and facilitators to research engagement, and future research priorities. We used descriptive statistics to summarize data and identified themes from text responses.

Results: Of 56 respondents, 44 (78.6%) identified as women, 11 (19.6%) as men, and 1 (1.8%) as gender queer, and 50% of respondents were over 25 years of age. While 24 participants (42.9%) previously participated in research, 51 (91.1%) were willing to participate in future studies, and 41 (73.2%) were willing to participate in HIV research. Unfamiliarity with HIV and reporting that HIV was not personally applicable were the primary reasons not to participate (n=8; 14.3%). Barriers to future research participation included time constraints (n=26; 46.4%) and mistrust of researchers (n=15; 26.8%). Facilitators included perceived benefits to individuals and their communities (n=47; 83.9%), and opportunities to share their voices/perspectives (n=34; 60.7%). Future research priorities include mental health and substance use.

Discussion: Findings will be used address the under-representation of ACB communities in HIV research by supporting community-informed engagement and recruitment practices. Learnings offer guidance to researchers on the importance of adopting anti-racist practices, building trusting relationships with ACB communities, and combatting stigma.

37

Exploring the Experiences and Related Care Gaps among Women Living with HIV in Canada using Concept Mapping of Canadian HIV Women's Sexual and Reproductive Health Cohort Study (CHIWOS) Findings

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Background: The Canadian HIV Women's Sexual and Reproductive Health Cohort Study (CHIWOS), a community-based, longitudinal study, has been exploring the experiences of women living with HIV (WLWH) in Ontario, British Columbia, and Quebec since 2011. To inform CHIWOS's future direction, we used concept mapping to guide our assessment of the physical, mental, sexual and reproductive health experiences, and related care gaps WLWH face in Canada.

Methods: Concept mapping is a method which involves systematically visualizing relations between concepts/ideas using graphical representations. Firstly, we performed content analysis of CHIWOS quantitative manuscripts and conference abstracts published, under review, or near submission before August 1, 2019. Individual concept maps were created for each publication and then analyzed for overall content. By combining similar themes into one visual, six composite maps were developed. Secondly, we presented our results to a group of 10 national experts and 12 WLWH to validate the composite maps and develop a single model summarizing the care gaps and experiences of WLWH.

Results: Of the 116 CHIWOS papers, 59 met our inclusionary criteria. Six main themes emerged to inform the development of six composite maps: 1) quality of life, 2) HIV care, 3) mental health, 4) sexual health, 5) reproductive health, and 6) health and experiences of transgender WLWH. Experiences of lower income, food insecurity, HIV-related and intersecting stigmas, violence, substance use, and depression were inter-related experiences that emerged from the findings. Social support, enhancing resilience, and women-centred HIV care were critical strategies women employed to navigate care gaps.

Conclusion: Experiences of structural barriers and intersecting stigmas emerged as critical factors shaping lived experiences of WLWH enrolled in CHIWOS. Mental health and other non-HIV care experiences were characterized as greater priorities than HIV care itself. Using these findings to influence care programming and delivery will be essential.

48

The effectiveness of arts-based HIV and STI prevention strategies with Northern and Indigenous adolescents in the Northwest Territories, Canada

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Background: HIV prevention tailored to gender, age and Northern contexts is critically important for promoting adolescent wellbeing. The Northwest Territories (NWT) have recently issued public health advisories due to increased sexually transmitted infections (STI) prevalence, notably highest among 15-30 year-olds. We examined the effectiveness of an arts-based HIV/STI program developed with and for adolescents in the NWT.

Methods: An Indigenous youth agency delivered school-based workshops to adolescents aged 13-18 in secondary schools in 17 NWT communities. Workshops utilized arts-based approaches (e.g., role-play, body-mapping) and included seven components held over 1-2 days. Participants completed baseline surveys immediately before and after completing the workshop. Surveys included questions about socio-demographics, HIV/STI knowledge, HIV/STI risk perception, sexual relationship power (SRP), and safer sex efficacy. Descriptive statistics were used to describe participant characteristics and outcome variables. Latent change score models were conducted to assess pre-post differences, using full-information maximum likelihood estimation.

Results: There were 344 participants (mean age 14.3 years, SD: 1.3; gender: men: 49%, women: 49%, non-binary: 2%; LGBQ: 15%; Indigenous: 79%) that completed pre-and post-test surveys. Most (66%) participants had attended this arts-based workshop in prior years. Latent change score models had good fit, and revealed a significant and large effect size for increased HIV/STI knowledge (β=2.10, SE=0.48, $p<0.001$) and significant and small effect sizes for increases in HIV/STI risk perception (β=0.24, SE=0.06, $p<0.001$) and safer sex efficacy (β=0.16, SE=0.07, $p=0.02$). As expected, the largest increases across several outcomes was the first time the participant took the workshop; individuals who had taken the workshop more times demonstrated smaller increases in HIV/STI risk perception and safer sex efficacy (β= -0.35, -0.43, $p<0.05$).

Conclusion: Arts-based approaches to HIV prevention hold potential for advancing HIV prevention with Northern and Indigenous youth, with promise for producing lasting benefits through increasing risk perception, safer sex efficacy, and knowledge.

55

Reducing STBBI Stigma in Primary Care: Lessons Learned through the Development of an Innovative E-learning Intervention for Family Physicians

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Background: Family physicians (FPs) are key providers of sexual and reproductive health care and the most common specialty caring for people living with HIV. To build frontline provider capacity to reduce stigma related to sexually transmitted and blood-borne infections (STBBIs), the Canadian Public Health Association (CPHA) is launching an online continuing medical education (CME) course targeted to FPs and other clinical care providers (forthcoming March 2021).

Methods: First, CPHA completed a needs assessment—including findings from 21 key-informant interviews, focus groups with 27 patients and a survey including 21 physician respondents—and convened a scientific planning committee to oversee course content development. Secondly, experts with lived/living, clinical and research experience were engaged to write dialogue for case scenarios which, with the support of game design and development experts, have been developed into digital interactive simulations. Supplementary information, resources and tools were curated and/or developed to form a comprehensive and interactive online course.

Results: E-learning is a preferred format for CME, and particularly suitable in light of COVID-19. The needs assessment revealed a need for and paucity of CME opportunities addressing psychosocial aspects of STBBIs and intersecting experiences of stigma (e.g., homophobia, transphobia, racism, substance use stigma). Addressing these complex and sensitive issues requires a safe learning environment, engaging and challenging content and opportunities for critical self-reflection. Several methods proved beneficial to achieving this through self-directed e-learning, including taking an interdisciplinary approach and applying adult education theory and game mechanics. Preliminary evaluation results will be shared, showing the extent to which the CME is succeeding at impacting attitudes, knowledge and practices that support stigma reduction.

Conclusions: CPHA has employed creative solutions to the challenges of addressing the complex, multi-faceted issue of STBBI stigma through e-learning. Lessons learned can inform other stigma reduction initiatives with service providers to advance STBBI prevention and care.

132

Nanâtawihowin Âcimowina Kika-Môsahkinikêhk Papiskîci-Itascikêwin Astâcikowina [Medicine/Healing Stories Picked, Sorted, Stored]: Adapting the Collective Consensual Data Analytic Procedure (CCDAP) as an Indigenous Research Method

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Utilizing Western research methodologies and methods are ineffective while conducting research alongside Indigenous Peoples. Research done with Indigenous Peoples using Western practices removes focus from community-driven priorities and instead places priority on data retrieval, analysis, and dissemination independent of the community being researched. Removing retrieved data from the community prevents Indigenous ownership, authority, and autonomy over their data. Bartlett et al. developed the “Collective Consensual Data Analytic Procedure” (CCDAP) in 2006 to address the lack of community involvement in the data analysis process. The CCDAP analyzes qualitative data with a community panel to reach a collective consensus of how to organize findings. This greatly reduces the possibility of introducing personal biases upon analysis while promoting the First Nations Information Governance Centre’s principles of Indigenous Ownership, Control, Access, and Possession® of the data retrieved. Furthermore, group participation helps to foster relationships within Indigenous communities. As Dr. Bartlett’s method can be cumbersome when presented with a large volume of interviews and data entries, Morning Star Lodge has adapted this process to create a method for data analysis that prioritizes Indigenous autonomy and self-determination while also streamlining the process to digital platforms. The adapted process was taken to ceremony and given the Cree name: NANÂTAWIHOWIN ÂCIMOWINA KIKA-MÔSAHKINIKÊHK PAPISKÎCI-ITASCIKÊWIN ASTÂCIKOWIN, translating to Medicine/Healing Stories Picked, Sorted, Stored. The CCDAP process was altered by first doing a thematic analysis of the data using NVivo software. Following the thematic analysis, digitalization was added to the process by means of programs like Microsoft PowerPoint and Excel. The digital aspect of analysis allows for a convenient method to perform analysis remotely using any videoconferencing platform that allows for screen sharing. The adapted method promotes a sense of community during data analysis and processing in a time where social distancing has become the norm during the COVID-19 pandemic.

169

Beyond the Data: A Community-led Storytelling Pilot Project from The Canadian HIV Women's Sexual and Reproductive Health Cohort Study (CHIWOS)'s Knowledge Translation/Exchange (KTE) Champion Project

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Background: Operating under Community-Based Research (CBR) and Greater Involvement of People with HIV/AIDS philosophies, CHIWOS (a longitudinal cohort study aiming to improve care for women with HIV) values the leadership of women with HIV throughout the research process. To honour our CBR commitment, it was essential that peer research associates (RAs) be supported in identifying and leading KTE efforts. In this pilot, one of the CHIWOS RAs (henceforth KTE Champion) developed and led an innovative, reciprocal KTE workshop series for a small group of CHIWOS participants. We discuss the process, lessons learned, and the final co-created anthology.

Methods: The KTE Champion's CHIWOS participants were invited to participate; six accepted. Workshops were co-facilitated with a participant, the KTE Champion, and the KTE Champion project coordinator. Six workshops occurred in September 2019 (once or twice per week). Workshops included: a check-in, meal, presentation/discussion regarding CHIWOS findings, and writing/creative exercises not tied to CHIWOS findings. During and following the workshops, we worked with participants one-on-one to develop and polish their anthology contributions; the wider CHIWOS Ontario team also contributed.

Results: Each participant submitted at least one piece to the final, 21-page anthology that includes poetry, autobiographical works, art, photography, and more. The co-creation process required personalized adaptations to enable each participant to complete the workshop series and anthology contribution. The discussions and contributions reflected and offered more nuance regarding the CHIWOS quantitative findings; for instance, some elaborated on who they considered a 'peer'. Many of the submissions reiterate the CHIWOS Women-Centred HIV Care Model – specifically, person-centred and community-centred care.

Conclusion: With responsive facilitation to each participant's needs, the workshop series successfully led to the development of a CHIWOS anthology. This process presents a novel form of KTE; an innovative version of 'member-checking' for quantitative research; and invites new CBR directions.

202

Dual Pharmaceutical Citizenship: Exploring Biomedicalization in the Daily Lives of Mixed HIV-serostatus Couples in Canada

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Background: Positive Plus One is the first large-scale mixed methods study of mixed HIV serostatus couples in Canada. As few studies had explored the lived experiences of mixed serostatus couples, we aimed to understand how biomedicalization i.e., a social process of commodification and expansion of the jurisdiction of medicine over health, influenced the everyday relationships of mixed HIV-serostatus couples.

Methods: We completed semi-structured, in-depth interviews among a purposive sample of HIV-positive and HIV-negative partners in current or past mixed-status relationships. Participants were recruited after completing an online survey where they consented to be re-contacted for qualitative interviews. Data were uploaded to Dedoose (ver.8.3.43) and analyzed by inductively identifying themes within dyads and across serostatus and sexual orientations.

Results: Fifty-one participants were interviewed (27 HIV-positive; 24 HIV-negative), representing a diversity of sexual orientations, gender identities, and other sociodemographic characteristics. Our findings illustrated the importance of learning biomedical knowledge for mixed-serostatus couples, its contribution to discourse around undetectable=untransmittable (U=U), and its role in rendering HIV mundane through routine ART adherence. By helping to make relationships work, biomedical knowledge normalized the experience of living in a mixed-serostatus relationship.

Conclusion: This work contributed novel evidence regarding the role of biomedicalization in the normalization of mixed-serostatus identities. We argue that everyday lives of mixed-serostatus couples are shaped by biomedical knowledge, and enacted through routine adherence to ART. These findings have implications for people who do not readily accept or have access to biomedical knowledge, particularly when treatment-as-prevention frames a “right” and “wrong” approach to HIV management. We introduce the concept of ‘dual pharmaceutical citizenship’ to underscore a process by which particular biopolitical and biomedical expectations are fulfilled in mixed-serostatus relationships. Future studies should focus on couples where at least one partner does not readily accept or have access to biomedical knowledge.

49

Putting 2SGBMSM Well-being on the Policy Radar

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Two Spirit, gay, bisexual, queer, and other transgender and cisgender men who have sex with men (2SGBMSM) in Canada face serious population-specific risks. Mental health issues in this community are well documented, as are higher rates of substance use and suicide. There is also increasing recognition of the socioeconomic risks of being 2SGBMSM, such as housing instability and lower income, sometimes leading to homelessness. At the same time, policies and services focus disproportionately on HIV and other STBBIs. AIDS Service Organizations (ASOs) are expressing growing concern with the lack of public policy attention to mental and emotional health among 2SGBMSM. In the absence of other supports, these organizations find themselves struggling, without mandates or resources, to meet the most urgent needs of their clients.

This paper presents preliminary findings of participatory action research that documents mental health and well-being needs in the 2SGBMSM men's community in partnership with the Gay Men's Sexual Health Alliance (GMSH). GMSH is a network of 30 ASOs and other organizations in Ontario concerned with 2SGBMSM health and well-being. Some key findings include: the wellness needs of 2SGBMSM are not being met, the lack of a population-specific health policy, and the need to mobilize the community. The findings of this research will help the GMSH develop resources, programs, and ways to influence policy, as well as add to a growing literature.

195

Le Cercle Orange : Creatively Responding to the Needs of People Living with HIV in the Montreal Region Without Access to Health Care

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According to the Institut national de santé publique du Québec (INSPQ), up to one-third of people newly diagnosed with HIV in Montreal are not covered by provincial health care. Without access to health coverage, it is extremely difficult for an individual to pay for essential health services and to enter or navigate the healthcare system at large.

"Le Cercle Orange," a Montreal-based project, is a creative and effective response to the needs of this population. The project, which is entirely free of charge for participants, connects existing resources across the city to provide ongoing care and treatment to PLHIV who do not otherwise have access to care. After assessing the specific needs of each participant, Le Cercle Orange connects them with a primary healthcare provider, treatment, routine tests, community organizations, and legal / immigration support, and provides ongoing follow-up to assure long-term continuity of care. The success of this innovative project is largely due to the dedication of our vast city-wide network of partners, and to the guidance of participants themselves.

Le Cercle Orange is about halfway through its two-year pilot phase. By January 2022, our objective is to have referred 100 people through the project, with 100% of participants receiving initial access to treatment, 90% maintaining an undetectable viral load, 80% continuing regular follow-up visits with their healthcare provider, and 60% taking steps to obtain provincial health coverage. The patient pathway, methodology of the project, characterization of our population and data reporting on the achievement of our objectives at mid-project will be available for presentation at CAHR 2021. Le Cercle Orange is aligned with the 95-95-95 targets of UNAIDS and Montreal sans sida objectives, and we hope it may inspire new strategies to address the healthcare needs of communities across the country.

79

Which Men Who Have Sex with Men?: Bisexual Men Who Have Sex With Men May Be At Greater Risk for Negative Health Outcomes.

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Background: Group membership can confer benefits such as improved wellbeing to members of marginalized groups, including men who have sex with men (MSM); however, these benefits are not equal across all MSM. Bisexual men may experience bi-phobic stigma and unique health disparities related to HIV and other sexually transmitted infections (STIs). We examined differences between gay, bisexual, and queer identifying men in terms of HIV/STI risk. We hypothesized that bisexual-identifying men would report more HIV risk behaviour (e.g., engaging in higher risk condomless anal sex: CAS).

Methods: Sexually active HIV-negative, cisgender MSM aged 16+ (total n=1,897; gay=1,584, queer=121, bisexual=122) were recruited via respondent-driven sampling (RDS) in Montreal, Toronto, and Vancouver. We examined the association of sexual identity with higher risk CAS at last sexual encounter (where no PrEP was used and partner status was unknown or with a partner who was living with HIV with an unknown/detectable viral load) and with having STI/HIV testing in the past six months (P6M); controlling for age, education, financial strain, and city cluster.

Results: RDS-weighted regression analyses indicated that bisexual men were significantly more likely to engage in higher risk CAS (aOR=10.70, p<.001, 95%CI:3.75,30.54; 71.8%) compared to gay (60.9%)or queer (56.4%) men . Bisexual men were also significantly less likely to have received P6M HIV testing (aOR=0.58, p<.001, 95%CI:0.44,0.75) or P6M STI testing (aOR=0.48, p<.001, 95%CI: 0.36,0.63).

Conclusion: Although they represent a small portion of MSM, bisexual MSM in Canada's largest cities were most underserved in HIV and STI testing, despite higher levels of risky sex. This may be due to higher levels of internalized stigma and lower levels of sexual orientation disclosure among bisexual MSM; which have both been associated with higher HIV risk (Feinstein & Dodge, 2019). Bisexual MSM may benefit from targeted HIV/STI testing interventions to improve their sexual health outcomes.

232

“If I’ve been waiting two hours to get high…I’m a little ticked”: A qualitative study on spatial inequities and access to syringe distribution in Vancouver, BC

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Vancouver, Canada is considered an international leader in the implementation of harm reduction programming. While other cities struggle to implement syringe exchange programs due to discrimination towards people who inject drugs (PWID) and funding issues, Vancouver has a city-wide syringe distribution policy intended to facilitate access to unlimited syringes and related injection equipment. These harm reduction supplies are more widely available in the Downtown Eastside (DTES), a neighbourhood with the highest concentration of PWID and services for PWID, than other parts of the city. We sought to understand spatial access to syringe distribution services among PWID both living within and outside the DTES. Between January and March 2020, we conducted qualitative interviews with 40 PWID regarding harm reduction in a field office located in the DTES. Interviews were audio-recorded, transcribed, and coded. Important themes related to syringe access were identified using inductive and deductive approaches. Study participants described different experiences related to spatial proximity and syringe access. First, those living in the DTES reported greater access to harm reduction supplies, often through social housing facilities and harm reduction facilities that were close to where they lived, than those living outside the area. Second, those who lived outside the DTES described having to make trips to the neighbourhood to access harm reduction supplies. A few expressed a desire for more accessible harm reduction services closer to where they reside. While some participants who lived outside of the DTES described accessing syringes through mobile delivery vans, they expressed dissatisfaction with long waits for delivery. These findings enhance knowledge around spatial inequities and harm reduction service delivery in Vancouver, where syringe access is embedded in policy as ‘city-wide’. These findings emphasize the importance of making syringe distribution services more spatially equitable for PWID living in areas outside the DTES.

58

Prevalence, Correlates and Health Impact of Healthcare Provider Counseling About Undetectable Equals Untransmittable (U = U) In Canada

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Background: On December 1, 2018, Canada officially endorsed the Undetectable=Untransmittable (U=U) campaign, becoming the first country in the Americas to do so. The uptake of the U=U message within clinical settings since then is however unknown. We investigated the percentage of people living with HIV (PLHIV) in Canada told of “U=U” by their provider and compared this to the U.S.

Methods: 120 PLHIV on treatment from Canada and 400 from the U.S. participated in the 25-country 2019 Positive Perspectives Survey. U=U discussion was a response of “Agree”/“Strongly agree” to: “My provider has told me about ‘Undetectable=Untransmittable’”. Group comparisons were with $\chi 2$.

Results: Among participants in Canada, distributions were: mean age, 38.3(SD=12.1); viral suppression, 64.2%[77/120]; women, 25.8%[31/120]; and recently diagnosed (2017-19), 30.8%[37/120]. Perceived comfort discussing with providers how to prevent HIV transmission did not differ between participants in Canada vs U.S. (49.2%[59/120] vs 55.3%[221/400], p=0.241), yet, participants in Canada reported significantly lower prevalence for having discussed U=U with their provider (55.8%[67/120] vs 70.8%[283/400], p=0.002), and the belief antiretrovirals prevent transmission (50.8%[61/120] vs 68.3%[273/400], p<0.001). Higher prevalence of U=U discussion in Canada was observed among those reporting vs not reporting their provider: ‘empowered them with information to make decisions’ (68.5%[50/73] vs 36.2%[17/47], p<0.001); ‘asked if they experienced any side-effects’ (71.6%[48/67] vs 35.8%[19/53], p<0.001); ‘discussed new available treatments’ (65.1%[41/63] vs 45.6%[26/57], p=0.032), and ‘sought their view before prescribing’ (68.2%[45/66] vs 40.7%[22/54], p=0.003). No significant differences in U=U discussion within Canada were observed by age, gender, sexual orientation, or HIV duration. U=U-exposed PLHIV in Canada reported significantly better health-related outcomes than U=U-unexposed: higher treatment satisfaction (70.1%[47/67] vs 43.4%[23/53]); optimal physical health (50.7%[34/67] vs 22.6%[12/53]); and lower suboptimal adherence (41.8%[28/67] vs 64.2%[34/53]) (all p<0.05).

Conclusion: U=U discussions were significantly associated with positive health outcomes. Proactive engagement of PLHIV by providers can help improve health-related outcomes.

59

Putting the Heart Back Into HAART: The Role Of HCP-Patient Engagement in Improving Health Outcomes Among Persons Living with HIV In Canada

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Background: Good healthcare provider (HCP)-patient engagement can help address unmet needs that negatively impact quality of life (QoL). We investigated HCP-patient discussions and explored associations with health outcomes among people living with HIV (PLHIV) in Canada.

Methods: Data were from the 2019 Canada Positive Perspectives Study of PLHIV on treatment (n=120). HCP-patient engagement was modified from the Observing Patient Involvement scale. Descriptive/multivariable analyses were performed.

Results: Demographics were: mean age (SD), 38.3(12.1) years; virally suppressed, 64.2% [77/120]; women, 25.8%[31/120]; and diagnosed between 2017-19, 30.8%[37/120]. Most were uncomfortable discussing with their HCPs concerns regarding having children (57.5%[69/120]), privacy issues (55.8%[67/120]), impact of HIV on their life (52.5%[63/120]), and emotional challenges (52.5%[63/120]).Top reasons for not broaching treatment concerns included: perception little could be done (24.2%[29/120]), perception that HCP's priorities differed from theirs (24.2%[29/120]), apprehensive of wasting doctor's time (22.5%[27/120], and difficulty broaching topic (22.5%[27/120]).
Overall, 52.5%[63/120] were updated on new treatment options and 55.0%[66/120] reported their HCP asked their views before prescribing treatment. However, 52.5%[63/120] still wanted more involvement in their care. The top issues considered treatment priorities among those diagnosed for ≥1 year (n=111) included reducing long-term impacts (46.9%[52/111]), minimizing treatment side-effects (46.0%[51/111]), and ensuring viral suppression (44.1%[49/111]).
Positive health-related outcomes increased with increasing HCP-patient engagement (low[n=45], moderate[n=37], high[n=38]), as follows: optimal mental health (42.2%, 27.0%, 60.5%, p=0.014); optimal physical health (20.0%, 35.1%, 63.2%, p<0.001); optimal sexual health (17.8%, 29.7%, 44.7%, p=0.028); optimal overall health (35.6%, 48.6%, 65.8%, p=0.023); and treatment satisfaction (26.7%, 56.8%, 97.4%, p<0.001). Participants who felt their HCP took their concerns to heart and prioritized matters important to them reported 8-fold higher prevalence of treatment satisfaction than those perceiving otherwise (82.5%[66/80] vs 10.0%[4/40], p<0.001).

Conclusion: High HCP-patient engagement was associated with better health-related outcomes. Improving the quality of communication may better support the goal of improving health-related QoL

69

Home Care Our Way – Findings from a Community-Based Study on Access to Home and Community Care Services amongst Older Adults Living with HIV in British Columbia

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Background: The proportion of older adults (50 years+) living with HIV (OALHIV) is increasing across Canada. This population has distinct health needs, and challenges accessing home and community care (HCC) services as compared to the general population. As OALHIV age, their need for non-acute care, such as HCC, will increase. Despite the role that HCC plays in the healthcare experiences of OALHIV, this field remains relatively unexplored.

Methods: The study objective was to understand barriers and facilitators experienced by OALHIV when accessing HCC services in British Columbia, and how aging with HIV affects well-being. Peer Research Associates and the study coordinator co-conducted 24 qualitative interviews with OALHIV, of whom 14 had ever used HCC services, and 10 who have not used these services. Interviews were conducted over the phone July-Dec 2020, with the exception of 7 in-person interviews conducted in Feb 2020 prior to pandemic restrictions. The interviews were professionally transcribed, and then coded and analyzed by the team using NVivo 12.0 software.

Results: The study yielded rich data describing multiple barriers and facilitators to accessing HCC services experienced by OALHIV in BC. Barriers included ethnicity, substance use, cumbersome application process, and lack of information. The main facilitator in accessing HCC services was extra support provided by care teams. In the area of aging with HIV, our team identified individual resiliency and informal support networks as the main themes.

Conclusions: There are individual and systemic level barriers and facilitators to accessing HCC services; critically, the support offered by care teams or community is precarious due to its non-formalized nature, and caregiver fatigue. Our findings suggest that formalized peer navigation support, and a simplified application process may improve equitable access to HCC services. Despite significant strengths in the HIV community, OALHIV continue to struggle with episodic disability, stigma, and social isolation.

149

Online Support for Workplace Disclosure Decision-making

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Background: Complex decisions about whether or not to disclose their HIV positive status in workplaces can be an important concern for people who have associated episodic health challenges, precarious employment or marginalization in other areas of their lives. The need for high-quality online supports for living well became increasingly evident during the COVID-19 pandemic. We designed an interactive online decision guide for workplace disclosure decision-making.

Methods: We used a participatory design process with people living with HIV, service providers, policy makers and researchers. The process consisted of consecutive phases of a survey (N=94) and community consultation (N=30). Using design thinking methods, results were transformed into an interactive online Decision Guide prototype. People living with HIV and service providers/employment experts (N=14) provided feedback on the prototype using the think-aloud approach.

Results: The cumulative results of the design process emphasized the importance of context in decision-making. The decision guide needed to present a balance of options without emphasizing either disclosure or non-disclosure. Privacy and confidentiality were important. The resulting Decision Guide consists of multiple pages. The first pages describe who the Decision Guide is for and privacy and confidentiality in the use of the guide. The next several pages provide information about making complex disclosure decisions and workplace rights. Subsequent pages are interactive and encourage people using the guide to explore their perceptions about safety around disclosure in their workplaces, their need for extra supports at work such as accommodations, their current life situations and supports, and their values related to disclosure. The guide includes opportunities to explore a continuum of disclosure options.

Conclusion: This presentation will summarize the design process and demonstrate the functionality of the Decision Guide. The guide can be used individually or with peer or healthcare provider support, and serve as an educational tool within workplaces.

216

Intersectional Determinants of Resilience among Mixed HIV-serostatus Relationships in Canada

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Background: Positive Plus One (PP1) is a study of mixed HIV-serostatus relationships in Canada (2016-19), involving PLHIV engaged in long-term relationships and HIV-negative partners. We report on qualitative findings related to relationship wellbeing embedded within our multi-method inquiry.

Methods: PP1 participants completing online study surveys were purposively recruited into private, semi-structured interviews to explore individual, dyadic and social situations that shaped wellbeing in their current/recent relationships. Qualitative data were thematically analyzed under a resilience framework.

Results: Participants included 27 PLHIV and 24 HIV-negative partners (10 female, 41 male). Despite sample heterogeneity, a common conceptualization of resilience emerged; that which supported the ideology of normalcy despite the daily presence of infectious disease risk. Treatment as Prevention (TasP) for PLHIV and an undetectable viral load were viewed to secure healthiness, HIV prevention, and achievement of life “as normal”. However, limited income and lack of third-party health insurance disrupted access to healthcare or medical supports for some, and subsequent attainment of safety/normalcy. Participants who benefited from established supports in the gay community or healthcare providers with a shared identity or social network appeared better positioned to combat threats and maintain relationship wellbeing. However, participants who felt unable to rely on others, largely due to stigma and/or discomfort about HIV, experienced compounded difficulty. Positive partners felt disabled from pursuing external resources to achieve healthiness, because disclosure itself could disrupt impressions of their life “as normal”.

Conclusion: TasP and undetectable=untransmittable (U=U) may enable normalcy and resilience for mixed HIV-serostatus couples. Social capital, particularly from the gay and wider HIV community, may offer protection for some couples facing other socioeconomic barriers. Such buffers appear to be absent for marginalized people of less social capital. The intersectional social determinants of couple’s resilience may be addressed through improved community awareness and acceptance of U=U.

231

"I want to stay until I die": A qualitative study of people living with HIV who use drugs with complex comorbidities in an integrated HIV care setting in Vancouver, Canada

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People living with HIV/AIDS (PLHIV) who use drugs experience a disproportionate burden of serious co-morbidities (e.g, depression, pain, other persistent conditions). Yet there are few examples of integrated service models for this population grounded in harm reduction approaches and responsive to their wider structural vulnerabilities (e.g. poverty, food insecurity, etc.). The potential role of such supports in fostering inclusion and influencing HIV care and outcomes among, and addressing the wider harms experienced by people who use drugs remains poorly understood. We examined how an integrated HIV care facility in Vancouver, Canada operating under a harm reduction approach and providing comprehensive supports (e.g., food services, counselling, etc.) influenced the functionality, health, and social inclusion of PLHIV who use drugs with complex comorbidities. Qualitative interviews were conducted with 30 PLHIV who use drugs with complex comorbidities who are clients of the Dr. Peter Centre. Interviews were audio-recorded, transcribed, and analyzed using inductive and deductive approaches. Our analysis identified four key themes. Participants discussed how the facility acted as a "lifeline" that helped them through periods of extreme instability (precipitated by homelessness, intense substance use, or the loss of a loved one), by connecting them with necessary supports and care. They also asserted that the facility plays an important role in the management of their HIV and co-morbidities, through connecting them to outside medical and community resources, as well as "in-house" management of health conditions. Participants discussed how the supportive and non-judgmental atmosphere of the facility contributed to enhanced mental wellness. Finally, participants reported that the facility's approach to harm reduction supported their substance use goals – from safer injection practices to pursuing abstinence. Our findings improve understandings of how an integrated service model, incorporating harm reduction practices and comprehensive supports, can respond to various health and social needs, enhancing quality of life.

71

Currents of Knowledge: An STBBI Prevention Project for Youth and Their Service Providers

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Currents of Knowledge project is funded by the Public Health Agency of Canada (PHAC) as one of the projects to be supported through the HIV and Hepatitis C Community Action Fund (CAF), from April 2017 to March 2022.

Under the Sexuality Education Resource Centre MB (SERC), Currents of Knowledge project works with incarcerated youth, trans and non-binary youth, Indigenous youth and their service providers in Manitoba, focusing on providing prevention education on STBBI and stigma reduction. This presentation will share experiences and findings from the first three years of work with youth involved in the project.

This work is evaluated for the continuous improvement of the project through a comprehensive evaluation plan with SMART objectives, short- and medium-term outcomes and predefined indicators and targets. Expected outcomes are to increase knowledge about STBBI prevention and related stigma, resulting in uptake of personal behaviours that reduce the risk of transmission in incarcerated youth. Specialized Peer Support trainings will be delivered to transgender youth in Winnipeg and to northern and rural Indigenous youth to increase awareness and knowledge about how to support other youth in stigma related to STBBIs, and to apply this knowledge in peer to peer intervention in Manitoba.

Evidence indicates that the project has been effective in reaching the short-term outcomes expected, since the priority populations have consistently demonstrated

overall increased knowledge or capacity according to the predefined indicators. Findings also demonstrate that the project has been successful in reaching its expected medium-term outcomes: most participants who joined follow-up evaluation activities reported that information has been useful in their lives and/or communities. We will share learnings presenting qualitative and quantitative data.

25

Public Health Morality and Another Pandemic: HIV-Negative Sexual Minority Men's Sexual and Pre-Exposure Prophylaxis (PrEP) Decision-Making During the First Wave of COVID-19

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Background: Experts have warned that COVID-19 control measures will amplify pre-existing health inequities among gay, bisexual, queer, and other men who have sex with men (GBM), including those related to HIV. For many HIV-negative GBM, COVID-19 has disrupted access to pre-exposure prophylaxis (PrEP) and has affected their sexual decision-making.

Methods: Our study examines these issues, drawing on in-depth interviews about PrEP conducted with 25 HIV-negative GBM living in Ontario during the first wave of the pandemic. Interviews were coded in NVivo using thematic analysis.

Results: We documented the existence of a public health morality—an emerging and contested ethical framework by which to determine how to be a 'good' and 'responsible' sexual citizen during the COVID-19 pandemic. This public health morality was shaped by several factors, including: self-concern versus risks posed to others; decreasing anxiety and becoming COVID-19 weary; shaming public health non-compliance; and comparisons between how society has responded to the HIV epidemic versus the COVID-19 pandemic. Our participants altered their sexual practices significantly to avoid COVID-19. Some halted, some continued, others restarted, and some stockpiled PrEP. Some participants' sexual practices countered public health messaging to avoid all 'non-essential' contact with people outside of one's household. Nonetheless, their COVID-19 prevention strategies, including minimizing the number of sexual partners, avoiding making new sexual connections, establishing trust, and evaluating people's 'common-sense', mirrored the negotiated safety (i.e. seroadaption) strategies earlier developed by GBM to mitigate HIV transmission.

Discussion: Participants modified top-down public health messaging to create pragmatic sexual practices in response to COVID-19. It is necessary to account for the nuanced ways in which GBM mitigate COVID-19 risks and are responding to a complex, ambiguous, and developing public health morality, in order to avoid further stigmatizing GBM sex, amplifying anxiety, and potentially increasing COVID-19 transmission by neglecting practical harm reduction measures.

60

The impact of the COVID-19 pandemic on a cohort of clients recently treated for Hepatitis C in Vancouver, BC

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Introduction: The provision of care and public services for individuals affected by HCV and HIV has been massively disrupted by the COVID-19 pandemic. The further impact of barriers to primary medical care, harm reduction services, food distributions, and other critical supports has yet to be fully understood.

Methods: The Preservation of Sustained Virologic Response (Per-SVR) study is an ongoing prospective clinical cohort study of adults in BC who achieved sustained virologic response (SVR) following direct acting antiviral (DAA) therapy. The Per-SVR survey (administered at 3- and 6-month intervals for up to 10 visits) was expanded in July 2020 to gauge the self-reported impact of COVID-19 on participants. Quantitative and qualitative responses were collected around the impact of COVID-19 on patients' experiences navigating healthcare, personal relationships, access to harm reduction services, and mental health.

Results: Of 122 participants surveyed between July and December 2020, 27 (22%) of respondents were tested for COVID-19 with 1 reporting a positive test. 47 (38.5%) respondents stated that COVID-19 impacted their ability to access health care between March and November 2020. While 9 (7.4%) did not access any services, 77 (63%) visited their healthcare provider in person. 78 (63.9%) respondents reported changes to employment status. Social distancing affected personal relationships for 22 (18%) respondents and had a negative mental health impact for 38 (31.1%). Our qualitative analysis found that COVID-19 exacerbated existing challenges in respondents' lives including: new or worsening mental health symptoms, especially depression and anxiety; compounded psychological impact from isolation and increased overdose deaths; and more acute experiences of stigma or discrimination related to homelessness and substance use.

Conclusion: A significant proportion of participants reported disruption in health care because of COVID-19. Responses indicate that COVID exacerbated existing challenges related to poverty, homelessness, substance use disorder, and mental illness.

129

Sexual Health, Public Health Responses, and Risks: A Qualitative Exploration of Gay, Bisexual and Queer Men's Negotiation of Safety during the COVID-19 Pandemic

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Background: The impact of COVID-19 on different communities is shaped by their respective histories of public health crises and pandemics including HIV/AIDS. Gay, bisexual, and queer men (GBQ) have been the focus of HIV prevention and treatment policies for almost 40 years. Our objective was to explore GBQ's interpretations and responses to COVID-19 public health measures in relation to their sexual health.

Methods: Engage-COVID-19 is a mixed methods study examining the impact of COVID-19 on GBQ living in Vancouver, Toronto, and Montreal. In-depth qualitative interviews were conducted to understand changes to GBQ's sexual and social lives, including HIV/STI and COVID-19 prevention strategies they used in the context of multiple pandemics. In this preliminary thematic analysis, we present findings from 27 qualitative interviews (November 2020–January 2021). Participants ranged in age from 23-76 yrs/old and included 5 men living with HIV and 18 men of colour.

Results: Many participants considered COVID-19 to be a significant threat to their health and the health of others. There was variation in how participants applied COVID-19 public health recommendations in their everyday sexual decision-making. Some men had not engaged in in-person sexual activity since the lockdown in March 2020, whereas others limited the number of sexual encounters with new and previously known partners. COVID-19 affected the type of context-dependent sexual activities many participants engaged in with partners outside of their household (e.g., avoiding penetrative sex; wearing masks and/or not kissing partners during encounters; having more virtual sex).

Discussion: Our study reveals that GBQ managed risk and in-person sexual contact in ways that were attentive to COVID-19 public health directives and were shaped by HIV/STI mitigation strategies. In reflecting on their sexual behaviours in the context of multiple pandemics, many GBQ worked to reconcile government COVID-19 safety recommendations and policies with their sexual practices and desires.

255

Difficulties accessing health care services during the COVID-19 pandemic in Canada: Examining the intersection between immigrant status and visible minority status

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Difficulties accessing health care services can result in delaying in seeking and obtaining treatment. Although these difficulties are disproportionately experienced among vulnerable groups, we know very little about the role of interaction between immigrant status and visible minority status on difficulties accessing health care services during the COVID-19 in Canada. Using Statistics Canada's Crowdsourcing Data, we apply the intersectionality framework to address this void in the literature. Specifically, intersectionality is a theory that seeks to examine the ways in which various socially and culturally constructed categories such as visible minority status and immigrant status do not act independently but rather interact on multiple levels creating a system of oppression that contribute to inequities in society. Results indicate that compared to white native-born, visible minority immigrants are less likely to report difficulties accessing non-emergency surgical care (OR=0.55, p<0.001), non-emergency diagnostic test (OR=0.74, p<0.01), dental care (OR=0.71, p<0.001), seeking help for mental health (OR=0.77, p<0.05), and making an appointment for rehabilitative care (OR=0.56, p<0.001) but more likely to report difficulties accessing emergency/urgent care (OR=1.46, p,<0.05). There is a dynamic interplay of factors operating at multiple levels to shape the impact of COVID-19, and COVID-19 related health inequities needs to be addressed through changes in social policies, strengthening institutional resources and relationships, and supporting the development of community leaders and key community social settings. Altering individual level determinants will be insufficient to reduce health inequities unless supported by structural changes.

74

Donor perspectives about harm reduction services for people living with HIV/AIDS (PLHIV) in a healthcare setting

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Background: Implementation of harm reduction services (HRS) in hospitals serving people living with HIV/AIDS (PLHIV) is important to prevent overdose deaths, facilitate retention in care and increase adherence to antiretroviral medication, thereby improving the HIV treatment cascade. Donor support plays a key role in delivering innovative HRS which might fall outside current funding streams. However, little is known about how the implementation of HRS, which are often highly stigmatized, may impact donor behaviours. We explored this issue within Casey House, a speciality HIV hospital in Canada.

Methods: A total of n=106 donors from Casey House, completed a short anonymous web-based survey assessing their knowledge of HRS and the potential impact of implementing new hospital-based HRS on donors' future support. Additionally, we conducted n=12 semi-structured qualitative interviews with donors examining their perspectives about harm reduction and their hopes/concerns for such programming at Casey House. Data were analysed using descriptive statistics and thematic analysis.

Results: Survey data show a high level of support for hospital-based HRS, with participants reporting that they "strongly agree/agree" with providing harm reduction equipment (85%), supervised consumption services (82%), and prescription opioid treatment (76%) at Casey House. A majority of participants (66%) claimed that implementing new HRS at Casey House would not impact their future donation, while 6% said they would be less inclined to donate. Interview participants were supportive of HRS at Casey House, but many spoke of the potential impact on "other" donors who might be opposed. Although some believed HRS should be fully funded by the government, most saw a role for donors in supporting such services.

Conclusions: Our findings show support of hospital-based HRS among donors and provide insight into how donor support may be affected when such services are introduced. This research has significant relevance for healthcare and other community-based AIDS service organizations.

144

Implementing Supervised Consumption Services in Acute Care: Hospital Staff Perspectives on an Innovation in Clinical Care

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Current acute care models do not adequately meet the needs of people who use drugs (PWUD). Formal and implied abstinence-based policies can exacerbate risks associated with in-hospital substance use, and contribute to high rates of premature discharge among PWUD, increasing the risk of readmission, overdose, and death. In 2018, the Royal Alexandra Hospital (RAH) implemented the first supervised consumption service (SCS) for patients as a harm reduction strategy to improve health outcomes and experiences of PWUD in acute care. Harm reduction programs show promise in acute care settings although they may be met with resistance among hospital staff due to tensions between harm reduction and the medical model. To date, no research has explored hospital staff perspectives on the delivery of SCS in acute care. We aimed to understand barriers and facilitators to providing high quality care to patients who access the RAH SCS. We employed qualitative methods using a focused ethnographic design and conducted semi-structured interviews lasting between 40 – 119 minutes with 20 RAH staff members in 2019 – 2020. Our analysis is ongoing but preliminary findings identify some barriers to providing high quality care, including stigmatizing attitudes toward PWUD, misconceptions about harm reduction principles, and a lack of clarity regarding proper post-consumption care policies. Staff report that when the acute care SCS is integrated effectively into a patient's care plan, it can improve patient-provider relationships and reinforce support for a harm reduction-oriented model of care. Findings from this study are informing quality improvement for the RAH SCS and hospital units and will ultimately support the development of new standards of acute care for PWUD.

235

A Framework for Capacity Bridging and Establishing Meaningful Collaboration between Peer Researchers and Academic Researchers in a Research Study

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Introduction: Many community-based HIV research studies incorporate meaningful engagement principles (GIPA/MEPA) by training people living with HIV as peer researchers. Unfortunately, there are still some aspects of research (e.g., quantitative data analysis and interpretation) where many projects fall short in realizing GIPA/MEPA principles. We developed a framework to connect the expertise of peer researchers (e.g., frontline experience, lived expertise, community connection) and academic researchers (e.g., theoretical knowledge, research methodology, data analysis) to enrich the impact of a research project and to bridge the capacity of both sectors.

Methods: The HIV Stigma Index is developed and implemented by people living with HIV to measure the effects of HIV stigma on health and wellbeing. We developed and used our capacity bridging framework to guide the meaningful engagement of peer researchers in this study. To do so, we created online sessions with peer researchers to teach them about data analysis and interpretation and ways to support knowledge translation and exchange (KTE) activities. Peer researchers in turn brought their lived expertise to guide interpretation of the data in an iterative process that resulted in region-specific, peer-led presentations of our key findings used to engage researchers, policy makers, and community members.

Results: Preliminary observations of the capacity bridging process saw an uptake in engagement from peer researchers, with deeper feelings of belonging and inclusion in the research process. Peer researchers' knowledge of the data analysis process increased measurably, and they were able to incorporate quantitative data into KTE activities. Academic researchers learned from the expertise of peer researchers to expand future analyses and KTE.

Conclusion: The capacity bridging framework provides greater depth and context of key research findings and integrates peer researchers in the development and implementation of KTE strategies; both increase the potential to make meaningful and "real-life" changes for people living with HIV.

87

Researcher Journeys: Water Connects us All. Using Water Teachings to Enrich the Work and Practice of Indigenous and Allied HIV Researchers

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Background: The Canadian HIV Women's Sexual and Reproductive Health Cohort Study – Positive Aboriginal Women (CHIWOS-PAW) actively Indigenizes and honours re-search by, with, and for Indigenous communities. To do so, Indigenous and non-Indigenous re-searchers must weave their ways of knowing and doing.

Methods: We share our team's journey of reflecting and re-defining what it means to 'do re-search' that honours Indigenous worldviews, using water teachings.

Results: Water connects us all; it is a living thing, it has memory and movement, and it will travel where it is needed. The process of re-search can be similarly conceptualized, as a cyclical journey laid down by our ancestors. We do not 'discover' new knowledge, but design a process to search for what is known and embodied by Mother Earth and our ancestors.

Indigenous re-searchers challenged traditional methodologies to prioritize connection with the lands and waters, and to let the women participating guide the questions. This felt natural to the Indigenous re-searchers; but they also felt apprehensive of the response within institutional systems and guidelines. However, as water teaches us to be fluid and ever-changing, so must re-search shift to highlight the strength of Indigenous communities.

Researchers trained in traditional academic settings had new learnings of how things are to be done, and under the mentorship and guidance of the Indigenous leads, began a journey to reconceptualizing re-search in a Good Way. This included centering Indigenous ways of knowing, ceremony, and cultural practices; changing re-search jargon to more inclusive and honouring language; and reaffirming commitment to Indigenous communities.

Next Steps: Our re-search approach reflects the knowledge gifted from the lands and waters. Allied re-searchers undertook a process of un-privileging traditional academic re-search paradigms to center Indigenous worldviews. Our Indigenized approach has implications for how re-search and knowledge translation can be done in the future.

145

Indigenizing our Research: Indigenous Community Leadership in HIV Epidemiology Research

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Data-intensive health research has become an increasingly useful tool for gaining valuable insights into population health. When using large datasets, it is crucial to engage communities in the research process in order to meaningfully address the public's needs. This is particularly important when engaging Indigenous communities in research, as there is a need to understand the historical and ongoing impacts of colonialism and acknowledge the strengths in Indigenous peoples' knowledges and experiences while advocating for Indigenous leadership and self-determination in research.

The aim of this paper was to describe an allyship-based approach to community-based participatory research that was used to engage and involve Indigenous peoples living with HIV in three data-intensive research projects exploring HIV outcomes of Indigenous populations in Canada. The goals of the project focused on: 1) supporting Indigenous peoples living with HIV to actively participate in the research process, 2) generating research questions that can be answered with the available datasets, and 3) integrating Indigenous and Western ways of knowing throughout the research process.

The methodology and study design employed throughout this project is rooted in meaningfully engaging Indigenous people with living experience to co-lead as researchers throughout their research priorities and responds to issues relevant to Indigenous peoples and communities.

Through our work, we have rediscovered valuable considerations and our recommendations for engaging and involving Indigenous peoples in research are as follows: ensuring stakeholders' involvement at the start of, and throughout the entire research project; honouring Indigenous ways of knowing, the land, and local protocols and traditions; prioritizing Indigenous voices; encouraging co-learning and building capacity; and developing longitudinal relationships with Indigenous communities.

167

Towards Amaamawi'izing (Collaborating) in Interdisciplinary Allyship: An Example from the Feast Centre for Indigenous STBBI Research

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Background: The Feast Centre for Indigenous STBBI Research is dedicated to community-led research and training across the four pillars of health (Clinical, Basic Science, Epidemiology and Social Science). Our intent is to contribute to cultural responses to STBBI in Canada through respectful and dynamic collaborations. Our goal is to increase the use of Indigenous knowledges in STBBI research to encourage transformational change that addresses the physical, emotional, spiritual, and mental health needs of Indigenous peoples living with or at risk of STBBI.

Method: The Anishinaabe conceptualization of collaborating, amaamawi'izing, facilitates the interdisciplinary and collaborative work of scholars working alongside Indigenous communities. As Indigenous peoples collaborating with allied researchers, amaamawi'izing embodies the principles of "all my relations" that honours our first teacher, Ashkaakaamikwe (Mother Earth). Amaamawi'izing is an active stance that embraces the action of coming together with one mind in respectful and inclusive approaches.

Findings: Akin to the Two Row Wampum principles as applied in research, Two-Eyed Seeing and Ermine's conceptualization of ethical space in research, we conceptualize amaamawi'izing as grounding the work of the Feast Centre. Amaamawi'izing is a relational, process-oriented concept that enriches interdisciplinary research through ethical and culturally sound processes that centres Indigenous knowledges and ways of being in health research.

Discussion: This is an evolving, traditionally informed, research model that emphasizes action, brings diverse people together, and is respectful of and appreciates difference. The Feast Centre's diverse team of Indigenous and allied researchers and community members is exploring this sophisticated approach to collaboration. Premised on deep listening, appreciating difference, and striving to achieve consensus, our activities and funding opportunities are informed by Indigenous consciousness and ways of being. Furthermore, we will demonstrate how the use of amaamawi'izing in our work offers safe, ethical space where difference does not separate, but is inclusive, valued, and upheld.

54

Reorienting opiate use prevention and recovery from individual to community responsibility: Client reflections from a social-ecological perspective

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Background: In Canada, the rate of opiate use, opiate use disorder (OUD), and associated mortality and morbidity are higher among Indigenous peoples than the general population. Indigenous peoples on medications for opiate use disorders (MOUD) often face distinct barriers that hinder their clinical progress, leading to treatment attrition. Injection drug use is the main risk factors for blood-borne infections such as HIV and Hepatitis C for many Indigenous clients with OUDs in Saskatchewan. Such clients experience a complex recovery process from their opiate use, which includes treatment dropout.

Methods: We used a social-ecological model to inquire into factors that contribute to risk for opiate use, development of opiate use dependency and treatment outcomes for clients on MOUD. Twenty-two clients with a history of treatment dropout for OUD and currently enrolled in MOUD participated in the study. In-depth, semi-structured interviews lasting an average of 30 minutes were conducted on-site.

Results: The participants' ages ranged from 28-49, 59% were female, and 95.5% self-identified as First Nations. Additionally, 50% of participants live with a blood-borne infection (HIV, Hepatitis C or both). Using a social-ecological framework to analyze the data, we identified four themes from the study relating to a) risk for substance use; b) factors sustaining substance use; c) factors leading to treatment, and d) treatment failure and re-enrollment.

Conclusion: Using a social-ecological model helps to understand factors that influence an individual's risk for OUD, decisions to pursue treatment and treatment outcomes. Furthermore, utilizing a social-ecological model to examine the experiences of clients on MOUD can provide practitioners and policy makers with possibilities to imagine supportive, multilevel interventions that can prevent individuals from developing OUD, and support retention to MOUD. Such interventions include mitigating adverse childhood experiences, supporting families, and creating safe community environments.

120

Indigenous Resilience and Allyship in the Context of HIV Non-Disclosure Criminalization: Conversations with Indigenous People Living with HIV and Allies Working in Support of Community

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In this research, we return to interview data from a 2017 community-based case study on the impacts of the criminalization of HIV non-disclosure on Indigenous people living with HIV. A total of 26 semi-structured interviews were completed and in this poster presentation, we discuss the results from a second round of coding the data, in which we focused on strengths, resilience, and the possibilities of allyship. Participants in the research included Indigenous people living with HIV, as well as Indigenous people (and one non-Indigenous person) not living with HIV who we are referring to as allies. While it is crucial to center Indigenous people living with HIV, we argue that there is also value in examining the role of allies in Indigenous HIV research and advocacy. Those allies, which included Elders, brought different perspectives to this research and we frame their relational engagement with others as allyship through kinship. Key themes that emerged from both those living with HIV and allies include: the importance of non-judgment and inclusion, community pedagogy as a practice of self-determination, honouring healing and supporting others, and centering Indigenous approaches to HIV. We reflect on the tensions and possibilities of allyship as kinship and examine ways forward for challenging criminalization and the impacts of settler colonialism.

128

The Importance of Social Relationships for Sexually Diverse Men Engaging in Sexualized Meth Use in British Columbia: A Qualitative Interview Study

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Sexually diverse communities have historically experienced higher rates of substance use than their heterosexual peers. Recently, healthcare providers and community members have increasingly engaged in conversations about the impact and role of sexualized methamphetamine use within these diverse communities, sometimes termed chemsex or PnP (party and play). Previous research and healthcare provision have predominantly understood these substance use practices and communities through a deficit model that undervalues the complex role that sexualized meth use plays in developing and maintaining social relationships, managing experiences of trauma, and seeking sexual fulfillment. To address this gap, we recruited 33 sexually and racially diverse men from across British Columbia to participate in semi-structured interviews with members of the research team. Interviews were then transcribed verbatim and coded for emergent themes. The research team identified strategies that sexually diverse communities who use substances employ to prevent the transmission of HIV and other sexually transmitted and blood borne infections, to protect their health and wellbeing, and to navigate the barriers that they face in accessing care. Participants shared how their social relationships were central to how they understand not only their methamphetamine use, but also their experiences with substance use support programs and service provision. PnP culture represented both an opportunity to find sexual partners and for connecting to people socially. Participants interested in changing, reducing, or stopping their chemsex involvement, felt it might have consequences for their social support. When entering substance use support programs, participants identified feeling marginalized for both their sexual orientation and their substance use, as non-cisheteronormative sex and methamphetamine use were disparaged by others. Through our interviews we show that in order to better address and support sexually diverse communities who use methamphetamine we need to develop programs and services that engage with these complex social relationships and phenomena.

137

"I'm Positively Positive" – Exploring how Older Adults Living with HIV maintain resilience

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Background: The life span of older adults (>50 years) living with HIV (OALHIV) who have achieved viral suppression approaches that of the general population. Nevertheless, OALHIV have distinct physical and mental health needs as compared to their HIV-negative counterparts. Stigma and discrimination continue to discourage some OALHIV from accessing help from non-HIV specific organizations and thus benefitting from services available to other older adults. Studies call for more research on how resiliency can be fostered among OALHIV.

Methods: One of the study objectives was to understand how aging with HIV affects the well-being of OALHIV. Peer Research Associates and the study coordinator co-conducted 24 qualitative interviews with OALHIV. Interviews were conducted over the phone July-Dec 2020, except for 7 in-person interviews conducted in Feb 2020 prior to pandemic restrictions. The interviews were professionally transcribed, and then coded and analyzed by the team using NVivo 12.0 software.

Results: Despite participants' accounts of the pervasive poverty, precarious housing, racism, and HIV-related stigma and discrimination in their lives, our research also gleaned many examples of resiliency, which we then categorized into two broad types: extrinsic and intrinsic. Intrinsic sources of resiliency included: 1) setting boundaries in the care they want to receive; 2) knowing their aspirations and needs; and 3) cultural and religious or spiritual practices. Extrinsic sources of resiliency included having the following: 1) someone to talk to; 2) trusting relationships with their care teams; 3) community and personal networks support; 4) and the support of AIDS service organizations.

Conclusions: Our findings echo previous research about the importance of positive therapeutic relationships and interpersonal bonds within their communities in fostering resiliency among OALHIV. Participants remarkably demonstrated resiliency which they fostered independent of external forces. Our research supports strengths-based approaches to identifying, cultivating, and celebrating resiliency in this community.

AUTHOR'S INDEX

INDEX DES AUTEURS

The author's index below identifies the paper number associated with each name. The numbers below are not page numbers. To search for a paper number use the 'Ctfl F' (control find) keyboard function.
L'index des auteurs ci-dessous indique le numéro de la communication associée à chaque nom. Les chiffres ci-dessous ne sont pas des numéros de page. Pour trouver le numéro d'une communication, utilisez la fonction « Ctrl F » (Control Find) sur le clavier.

A

B

C

D

E

F

G

H

I

J

K

L

M

N

O

P

Q

R

S

T

U

V

W

X

Y

Z