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CAHR 2022 VIRTUAL
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Striving Towards Equity and Flourishing in the HIV Response

Tourné vers l'équité et mieux contrer leu VIH

ABSTRACTS
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CAHR 2022 Virtual

Striving Towards Equity and Flourishing in the HIV Response

L'ACRV 2022 Virtuel

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ORAL ABSTRACTS / EPOSÉS ORAUX

Basic Sciences Oral Abstracts / Sciences fondamentales eposés oraux

10 Characterizing the Intracellular Trafficking Pathways Hijacked by HIV-1 Nef to Downregulate SERINC5

Mitchell Mumby[1], Aaron Johnson[1], Eric Arts[1,2], Jimmy Dikeakos[1]
[1]University of Western Ontario, London, Canada, [2]Joint Clinical Research Center, Kampala, Uganda

A contributing factor to HIV-1 persistence is its ability to evade host innate and adaptive immunity. The host restriction factor SERINC5 restricts HIV-1 virion infectivity by incorporating into the viral membrane during egress. To overcome this, HIV-1 Nef interacts with Adaptor Protein 2 (AP-2), which triggers cell surface SERINC5 internalization, thereby preventing virion incorporation and restoring infectivity. While it is understood that internalized SERINC5 is ultimately re-routed to the lysosome where it is degraded, the specific trafficking pathways HIV-1 Nef hijacks to direct internalized SERINC5 to the lysosome remains unclear. Interestingly, Nef utilizes its [D/E]xxxLL$_{167}$ dileucine motif to interact with a variety of Adaptor Proteins (APs) at various locations within the endolysosomal network to facilitate specific trafficking events in a temporal and spatial manner.

Herein, we describe an ND$_{164}$ Nef polymorphism occurring within the HIV-1 Nef dileucine motif that uncouples cell surface SERINC5 downregulation from a cognate Nef function, CD4 downregulation. The presence of the ND$_{164}$ polymorphism results in a significant decrease in infectious virus yield in the presence of SERINC5 compared to Nef isolates lacking this polymorphism, suggesting this region of Nef is key for SERINC5-dependent restriction. To decipher the mechanism(s) behind this restriction, we will first define the molecular interface between Nef and the various APs present within the endolysosomal system. Subsequent siRNA-based experiments will then be conducted to determine which APs are likely involved in Nef-mediated re-routing of internalized SERINC5 to the lysosome.

Overall, these studies will define the precise trafficking itinerary commandeered by Nef to downregulate cell surface SERINC5. Characterizing these trafficking pathways Nef hijacks to downregulate SERINC5 could reveal an ‘Achilles Heel’ that could be exploited using novel therapeutics designed to block such interactions.

12 Impact of early antiretroviral therapy on tissue resident myeloid cells in the liver and lung of SIV-infected rhesus macaques

Julien Clain[1], Henintsoa Rabezanahary[1], Gina Racine[1], Charles Joly Beauparlant[1], Arnaud Droit[1], Ouafa Zghidi-Abouzid[1], Jérôme Estaquier
[1]*Université Laval, Québec, Canada*

Background: Viral dissemination occurs early after infection targeting CD4 T cells and monocytes/macrophages. Despite the administration of antiretroviral therapy (ART), human and simian immunodeficiency virus (HIV/SIV) persists in treated individuals indicating viral reservoir seeding. Monocytes derived from bone marrow and tissue resident macrophages (TRMs) derived from yolk sac, are short-lived and long-lived cells, respectively. We recently demonstrated that early ART efficiently prevents infection of monocytes in SIV-infected rhesus macaques. Thus, our study focused on the role of TRMs in maintaining viral reservoirs.

Methods: Rhesus macaques were infected with SIVmac251 and treated at day 4 post-infection with a cocktail of antiretroviral drugs. Cells from liver and lung were mechanically isolated. The phenotype of TRMs was analyzed by flow cytometry using specific antibodies directed against the CD44, TIM-4, CD117, CD206, CD200R, CD64 and LYVE-1 molecules (previously defined in mice). The levels of viral DNA and RNA were quantified by qPCR. In situ hybridization was used to detect viral RNA. Furthermore, transcriptomic analysis was performed to assess gene profiles in both tissues.

Results: Our results revealed that CD117, CD206 and LYVE-1 are specific markers of TRM cells from liver and lung of SIV-infected rhesus macaques. In non-treated SIV-infected monkeys, higher levels of inflammatory and ISG transcripts were observed consistent with the detection of viral RNA and DNA in both tissues. The levels of viral RNA are positively correlated with viremia in the blood. Early ART prevented the establishment of viral dissemination in both tissues as well as the inflammation.

Conclusion: Herein, we analyzed the phenotypes of TRMs in the lung and liver of SIV-infected rhesus macaques. We demonstrated that early ART efficiently prevents viral seeding both in the liver and lung concomitantly by preventing inflammation. These results highlight the crucial importance of early treatment by decreasing anatomical viral reservoirs.

14 Autophagy-dependent mitochondrial metabolism drives optimal virus-specific T-cell responses in the context of natural control of HIV-1 infection: towards successful cures

Julien Van Grevenynghe[1], Hamza Loucif[1], Xavier Dagenais-Lussier[1], Cherifa Beji[1], Roman Tellitchenko[1], Jean-Pierre Routy[2], David Olagnier[3], Lena Cassin[3], Daina Avinovis[4], Jorg Hermann Fritz[5]
[1]IAFSB-INRS, Laval, Canada, [2]Mc Gill University Health Centre, Montreal, Canada, [3]Aarhus University, Aarhus, Denmark, [4]Metabolomic core facility of Mc Gill University, Montreal, Canada, [5]Mc Gill University, Montreal, Canada

Background: Understanding the mechanisms that are responsible for natural immune T-cell protection against HIV-1 in elite controllers (EC) is key to achieve successful cure strategies. This is truer considering that a second case of EC recently showed a complete treatment-free remission of HIV-1 infection (Esperanza patient). Here, our aim was to show that autophagy, a lysosomal degradative system, drove superior anti-HIV-1 responses in EC by providing cells with diverse cellular energy stores.

Methods: We assessed autophagy in anti-HIV-1 CD8 and CD4 T-cells from EC and age matched patients under antiretroviral therapies (ART). We used complementary methods including electron microscopy and flow cytometry to measure numbers of autophagic vesicles along with expression of autophagic markers. We inhibited autophagy in EC by Beclin-1 gene silencing or with lysosomal blockers and assessed mitochondrial metabolism. Our Seahorse device allowed us to assess not only mitochondrial energy production, but also to what extent the latter was fueled by the fatty acid oxidation (FAO) and glutaminolysis. Finally, we investigated polyfunctional anti-HIV-1 T-cell responses in EC with or without lysosomal and specific metabolic inhibitors (etomoxir and BPTES, respectively for FAO and glutaminolysis).

Results: We confirmed highly active AMPK-dependent autophagy in anti-HIV-1 T-cells in EC when compared to ART. Autophagy in EC provided lipid- and protein-based energy substrates, respectively in CD8 and CD4 T-cells, which fueled mitochondrial energy production. We validated that autophagy-related FAO and glutaminolysis in EC respectively ensured proper anti-HIV-1 CD8 and CD4 responses. Finally, anti-HIV-1 T-cell responses in ART could be reinforced with the AMPK inducer AICAR.

Conclusions: Our data revealed that autophagy and metabolic pathways are working together in EC to fuel energy production and drive optimal T-cell immunity against HIV-1. The fact that we could reinforce anti-HIV-1 responses in ART by targeting those pathways has to be considered for the next cure developments.

33 Killing two preys with one bullet: Harmine inhibits both HIV-1 and coronavirus replication

Subha Dahal[1], Keira Clayton[2], Tyler Cabral[1], Ran Cheng[1], Ramy Malty[3], Shahrzad Jahanshahi[1,3], David Shen[1], Walid Houry[3,4]
[1]Dept. of Molecular Genetics, University of Toronto, Toronto, Canada, [2]University of Massachusetts Medical School, Worcester, USA, [3]Dept. of Biochemistry, University of Toronto, Toronto, Canada, [4]Dept. of Chemistry, University of Toronto, Toronto, Canada

Since existing drugs target viral enzymes and entry proteins, innovative means of enhancing existing therapeutics requires identification of host factors or processes critical for the virus. Given HIV-1's reliance on host alternative splicing for replication, modulators of this process could serve as novel therapeutics to complement and/or enhance existing drugs.

Screening of several kinase inhibitors that affect key splicing regulatory factors (SR proteins) identified a β-carboline alkaloid compound, Harmine, that suppressed HIV-1 at low micromolar concentrations. Harmine reduced HIV-1 unspliced and singly-spliced RNAs abundance with limited impact on multiply-spliced RNAs.

Treatment of primary CD4+T cells from healthy donors infected with HIV-1 resulted in ~50% reduction in viral structural proteins and altered accumulation of viral RNAs. Although Harmine is a known inhibitor of DYRK1A and monoaminoxidase A, subsequent studies determined that the antiviral effect was independent of effects on either enzyme.

Addition of Harmine to primary CD4+T cells selectively altered the expression of host SR proteins and several SR kinases, increasing CLK1 while reducing CLK2 kinase levels. Parallel studies involving depletion of CLK1 or CLK2 determined that loss of CLK1 increases HIV-1 expression while CLK2 depletion reduces it, suggesting that Harmine's anti-HIV-1 activity could be mediated through changes in the relative activity of these CLKs.

To test pan-antiviral activity of Harmine, we assessed its activity against multiple coronaviruses, including SARS-Cov2. Harmine treatment one h post infection (hpi) suppressed replication of both Human-229E and SARS-Cov2 coronaviruses as demonstrated by reduced viral nucleocapsid protein expression and genomic RNA release in media. Delaying compound addition by 16 hpi yielded a similar inhibition of virus replication, suggesting that harmine affects post-entry processes. In addition, cells pre-treated with Harmine had reduced capacity to support coronavirus replication.

Together, our data establishes the feasibility of manipulating cellular processes to control the replication of multiple human pathogens of concern.

62 The Adjuvant Role of Nef Inhibitors Towards a Cure for HIV/AIDS

Corby Fink[1,2], Antony Lurie[1], Jimmy Dikeakos[1], Gregory Dekaban[1,2]
[1]*Department of Microbiology and Immunology, University of Western Ontario, London, Canada,*
[2]*Biotherapeutics Research Laboratories, Robarts Research Institute, London, Canada*

The HIV-1 accessory protein, Nef, plays a central role in HIV virulence and eventual progression to AIDS. Nef contributes to HIV pathogenesis by impairing T cell activation and maturation, subverting apoptosis, and down-regulating cell surface major histocompatibility complex class I (MHC-I) expression.

Through its interaction with phosphofurin acidic cluster sorting protein-2 and localization to the trans-Golgi network (TGN), Nef interacts with Src family tyrosine kinases (SFK) to initiate a misdirected signaling cascade that culminates in MHC-I internalization and TGN sequestration. Collectively, Nef-mediated MHC-I down-regulation minimizes immune recognition of HIV-1-infected cells and is a key factor for why a functional cure for HIV remains elusive.

We identified a small molecule, H3-1, that was predicted through structure-function design to disrupt the Nef:SFK interaction and exploit this interaction as a target for therapeutic intervention. H3-1 counteracted Nef-dependent MHC-I down-regulation, resulting in measurable improvements in cell surface MHC-I expression in HIV-1-infected primary human and mouse CD4+ T cells in the absence of cytotoxicity.

Therefore, we assessed the feasibility of H3-1 treatment to enhance antigen presentation in a transgenic mouse model of AIDS-like disease characterized by Nef expression in CD4+ T cells. In preliminary studies, H3-1 was rapidly cleared in vivo as assessed by mass spectrometry; however, ex vivo cultured transgenic mouse-derived CD4+ splenocytes exhibited enhanced presentation of cell surface MHC-I when complexed to a model epitope following H3-1 treatment.

Alongside organic synthesis to generate H3-1 analogues with improved in vivo pharmacokinetics, future studies will evaluate the adjuvant role of H3-1-mediated enhanced antigen presentation in the context of a dendritic cell-based vaccine strategy.

76 Scaffolding Viral Protein NC Nucleates Phase Separation of the HIV-1 Biomolecular Condensate

Anne Monette[1], Meijuan Niu[1], Maya Nijhoff Asser[1,2], Robert J. Gorelick[3], Andrew J. Mouland[1,2,4]
[1]Lady Davis Institute at the Jewish General Hospital, Montreal, Canada, [2]Department of Microbiology and Immunology, McGill University, Montreal, Canada, [3]AIDS and Cancer Virus Program, Leidos Biomedical Research, Inc., Frederick National Laboratory for Cancer Research, Frederick, USA, [4]Department of Medicine, McGill University, Montreal, Canada

Background: Liquid-liquid phase separation (LLPS) by multivalent interactions between proteins and nucleic acids generates membraneless, biomolecular condensates (BMCs) compartmentalizing and concentrating specialized molecules that nucleate and drive fundamental biological processes. While emerging evidence indicates that many viruses rely on LLPS for their replication, virus-engineered BMCs remain to be functionally characterized.

Previously, we demonstrated that pan-retroviral nucleocapsid (NC) protein phase separates to assemble as BMCs favoring replication by regulating genomic RNA positioning and trafficking. Hypothesis: With retroviral proteins representing those having the highest degree of disorder promoting their phase separation, we hypothesized that the core viral protein components of mature virions may co-condense to themselves become BMCs that promote virus ingress and infectivity.

Methods: Using rigorous combinations of biochemical assays and quantitative live-cell imaging techniques, we explore the predisposition, mechanisms, dispersion, and pharmacologic sensitivity of human immunodeficiency virus-type 1 (HIV-1) BMCs.

Results: Fluorescence recovery after photobleaching of HIV-1 core proteins is proportional to their degrees of disorder. The mostly disordered HIV-1 NC protein represents a scaffolding condensate onto which HIV-1 capsid, reverse transcriptase and integrase accumulate as client condensates to form mobile BMCs that are trafficked along cytoskeletal networks and accumulate in nuclei. These HIV-1 BMCs are also sensitive to treatment with NC zinc-ejecting drug, azodicarbonamide. We demonstrate that while full-length Gag does not readily phase separate in cells; addition of HIV-1 protease inducing its maturation leads to condensation of proteolytic Gag products. Finally, we discover that intrinsically disordered viral core proteins phase separate and self-assemble with the viral genomic RNA in vitro to attain positioning and geometry characteristic of a viral reverse transcription complex.

Conclusion and Perspectives: The finding that HIV-1 core proteins co-condense to attain virus-like architecture redefines the virion cores as BMCs. This study responds to the critical challenge of advancing anti-viral therapies targeting viral BMCs.

91 Phylogenetic reconstruction and in cellulo functional characterization of the ancestral Nef protein of primate lentiviruses

Abayomi Olabode[1], Mitchell Mumby, Jimmy Dikeakos, Art Poon
[1]*Department of Pathology & Laboratory Medicine, Western University, London, Canada*

Nef is an intrinsically disordered accessory protein unique to the primate lentiviruses (PLV), including HIV-1, HIV-2 and SIV. Nef has several interactions with host cellular proteins to enhance virus replication, including antagonistic binding of tetherin and downregulation of CD4, MHC-I and the SERINC5 restriction factor. In this study, we reconstructed the nef sequence of the PLV ancestor and characterized its function in cellulo.

We used BEAST to sample time-scaled phylogenies relating 34 PLV Nef amino acid sequences from the posterior distribution incorporating prior information on the origin of PLVs. We sampled 1,000 trees from the converged chain samples and then reconstructed ancestral sequences using Historian, which models both substitution and indel events. Next, we extracted the best supported evolutionary pathway from the root to HIV-1 group M and then synthesized the corresponding nucleotide sequences (GeneArt Gene Synthesis, ThermoFisher). Sequences were amplified and cloned into the pN1 expression vector such that expressed Nef is fused to eGFP fluorophore. SERINC5 was exogenously expressed in trans using an HA-tagged vector. CD4+ HeLa cells were plated 24h and then co-transfected with Nef-eGFP and SERINC5 plasmids using PolyJet. After 24h, cells were processed for cell surface staining with conjugated antibodies for flow cytometry analysis, and compared to HIV-1 and SIVmac259 controls.

Reconstructed Nef sequences tended to become shorter along lineages leading to HIV-1/M with increasing disorder. At the root, the mean length was 225 (IQR 206-231) amino acids. The dileucine motif was conserved across all ancestral lineages leading to HIV-1/M. Downregulation of SERINC5 by the synthetic PLV ancestral Nef was not significantly different from SIVmac259 or HIV-1 ($P>0.05$), but downregulation of surface CD4 was significantly reduced ($P<10–4$).

Our findings suggest that Nef-mediated CD4 downregulation and intrinsic disorder were likely essential for the establishment of HIV-1/M in humans.

101 Dynamics of regulatory CD8 T-cells in acute HIV infection and following early ART initiation

Alexis Yero[1], Tao Shi[1], Madeleine Durand[2], Jean-Pierre Routy[3,4], Cécile Tremblay[2,5], Cecilia T. Costiniuk[3,4], Mohammad-Ali Jenabian[1]
[1]Université du Québec a Montréal (UQAM), Montreal, Canada, [2]CHUM Research Centre, Montreal, Canada, [3]Research Institute of McGill University Health Centre, Montreal, Canada, [4]Chronic Viral Illness Service, Division of Infectious Disease, Department of Medicine, Glen Site, McGill University Health Centre, Montreal, Canada, [5]Department of Microbiology, Infectiology and Immunology, Faculty of Medicine, Université de Montréal, Montreal, Canada

Background: HIV infection is associated with an increase in immunosuppressive FoxP3+ CD8 Tregs, which contribute to disease progression and immune dysfunction. However, the dynamics of CD8 Tregs in acute infection and following early ART initiation remain understudied.

Methods: Peripheral blood mononuclear cells (PBMCs) were collected from HIV-infected untreated individuals in acute (n=26) and chronic phases (n=10), ART-treated in early infection (n=10, median of ART initiation: 5,5 months post-infection), elite controllers (n=18), and HIV-uninfected controls (n=21). CD8 Tregs subsets were characterized by multiparameter flow cytometry.

Results: HIV infection was associated with an increase in total and effector memory CD8 Tregs in both acute and chronic infection, while early ART normalized only the frequencies of total CD8 Tregs but not their effector memory subset. CD8 Treg expression of CD31, a marker of recent Tregs migrating from the thymus, decreased overtime during infection, indicating the extra-thymic differentiation of CD8 Tregs, which was normalized by early ART. We also observed an overtime increase in CD8 Treg immune activation (HLADR+/CD38+), immune senescence (CD57+/CD28-), and PD-1 expression during both acute and chronic infection, while early ART initiation only restored PD-1+ CD8 Tregs. CD8 Tregs in untreated individuals expressed higher levels of immunosuppressive LAP(TGF-β1), which remained unchanged despite early ART. Additionally, the expression of gut homing markers CCR9 and Integrin-β7 by CD8 Tregs increased in both acute and chronic infections and remained higher than uninfected controls despite early ART. HIV elite controllers share most of the CD8 Treg characteristics in uninfected or early ART-treated individuals.

Conclusions: Although early ART initiation resulted in normalization of total CD8 Tregs frequencies, it was unable to reduce CD8 Treg gut homing potential nor LAP(TGF-β1) production, which in turn, may contribute to gut fibrosis, disease progression, and immune dysfunction despite early ART initiation.

129 Effect of immunosuppressants on the HIV reservoir in kidney transplant recipients

Alessandro Modica[1], Rémi Fromentin[1], Amélie Pagliuzza[1], Pierre Gantner[1,2], Catherine Bourassa[1], Jonathan Richard[1,2], Heloise Cardinal[1,3], Andres Finzi[1,2], Nicolas Chomont[1,2]
[1]Crchum, Montreal, Canada, [2]Université de Montreal - Department of Microbiology, Infectiology and Immunology, Montreal, Canada, [3]Université de Montreal - Department of Medecine, Montreal, Canada

Background: HIV persists through the proliferation of latently infected CD4+ T cells. Although most proviruses persist in a latent form, a small number of infected cells produce virions. Immunosuppressants given to people undergoing kidney transplants to prevent rejection block several aspects of the immune response including proliferation and activation of T cells. We hypothesized that immunosuppressive therapy could reduce both the proliferation of reservoir cells and markers associated with residual production of HIV.

Methodology: Seven HIV-infected participants on suppressive ART who underwent kidney transplantation and initiated immunosuppressive therapy were enrolled. Longitudinal blood samples were collected before and after the transplant (6-7 samples per participant, over 2 years). The effects of immunosuppressants on T cell activation and plasma HIV-envelope antibody responses (a surrogate of virion production) were assessed by flow cytometry and ELISA, respectively. HIV DNA and RNA were quantified by qPCR in isolated CD4+ T cells.

Results: As expected, we observed a significant decrease in the expression levels of HLA-DR and Ki67 in CD4+ T cells after transplantation, which was accompanied by an increase in the frequency of central memory cells and a sharp decrease in the frequency of regulatory T cells. Antibody levels to the HIV envelope also decreased following immunosuppressive therapy initiation. Overall, there was a modest decrease in HIV DNA and RNA levels after kidney transplantation (median fold change = 0.9 and 0.6 respectively), however this decrease was not sustained.

Conclusion: Immunosuppressive therapy decreases the proliferation and activation of CD4+ T cells which is concomitant to a modest and transient decrease in HIV reservoir markers in most participants. Our results suggest that current immunosuppressive drugs are insufficient to profoundly and durably affect the HIV reservoir and suggest that the homeostatic forces that maintain the pool of infected cells during suppressive ART will be difficult to counteract.

146 HIV-1 Transmitted Founder Virus Vif Proteins Have Variable Abilities to Induce Degradation of APOBEC3 Retroviral Restriction Factors

Amit Gaba[1], Quinlan Carter[1], Shreoshri Bhattacharjee[1], Linda Chelico[1]
[1]Department of Biochemistry, Microbiology, and Immunology, College of Medicine, University of Saskatchewan, saskatoon, Canada

The APOBEC3 family of cytidine deaminases includes five members that have been reported to inhibit HIV-1 in absence of its Vif protein. HIV-1 Vif antagonizes APOBEC3 proteins by inducing their ubiquitination and degradation through proteasome.

Previous studies have identified several domains of Vif that interact with APOBEC3 proteins. However, there is a lack of studies on the effect of Vif on co-expressed APOBEC3 proteins, such as would occur in HIV infected cells. One study from our lab has shown that APOBEC3G and APOBEC3F have the ability to interact and form a hetero-oligomer. This APOBEC3F/APOBEC3G (A3F/A3G) hetero-oligomer was found to be more resistant to Vif mediated degradation from the HIV-1 LAI molecular clone that originated from an HIV-1 positive patient at an unknown time after transmission.

However, HIV-1 transmitted/founder (T/F) virus molecular clones that were isolated from patient samples within 6 weeks of infection are now available. Analysis of amino acid sequences of Vif protein of these TF viruses revealed several differences from HIV-1 LAI. Analysis of multiple TF viruses using an APOBEC3 degradation assay revealed variability in Vif mediated degradation of individual APOBEC3 enzymes.

Moreover, the A3F/A3G hetero-oligomer showed variability in sensitivity to Vif from different TF viruses. Our results also show that when bound to APOBEC3G, APOBEC3F is partially protected from TF virus Vif mediated degradation. The A3F/A3G hetero-oligomer still interacts with Vif, thus the mechanistic basis of partial resistance appears to be linked to ubiquitination.

A better understanding of the APOBEC3/Vif interface and exploration of the mechanisms resulting in the variability of APOBEC3 degradation induced by TF viruses will help in determining the contribution and consequences of APOBEC3 activity during a clinical HIV infection.

241 Quantity rather than quality of the polyfunctional anti-gp120/Env-specific responses in HIV controllers are associated with HIV control

Sanket Kant[1,2,3], Ningyu Zhang[1,3], Alexandre Barbé[1,4,5], Jean-Pierre Routy[1,3,6,7], Cécile Tremblay[8,9], Réjean Thomas[10], Jason Szabo[3,7,10], Pierre Côté[11], Benoit Trottier[11], Roger LeBlanc[12], Danielle Rouleau[9], Marianne Harris[13], Franck P. Dupuy[1,3], Nicole F. Bernard[1,2,3,7,14]
[1]Research Institute of the McGill University Health Centre, Montreal, Canada, [2]Division of Experimental Medicine, McGill University, Montreal, Canada, [3]Infectious Diseases, Immunology and Global Health Program, Research Institute of the McGill University Health Centre, Montreal, Canada, [4]Faculté de Médecine de l'Université de Lille Henri Warembourg, Lille, France, [5]Ophthalmology Department, Lille University Hospital, Lille, France, [6]Division of Hematology, McGill University Health Centre, Montreal, Canada, [7]Chronic Viral Illness Service, McGill University Health Centre, Montreal, Canada, [8]Centre de Recherche du Centre Hospitalier de l'Université de Montréal, Montreal, Canada, [9]Département de Microbiologie Infectiologie et Immunologie, Université de Montréal, Montreal, Canada, [10]Clinique Médicale l'Actuel, Montreal, Canada, [11]Clinique de Médecine Urbaine du Quartier Latin, Montreal, Canada, [12]Clinique Médicale Opus, Montreal, Canada, [13]British Columbia Centre for Excellence in HIV/AIDS, Vancouver, Canada, [14]Division of Clinical Immunology, McGill University Health Centre, Montreal, Canada

A rare subset of people living with HIV (PLWH), known as elite controllers (EC), control their viral load (VL) below detectable levels whereas viremic controllers (VC) maintain VLs at <3000 copies of HIV RNA/ml of plasma spontaneously, without antiretroviral treatment. The underlying immunological mechanisms behind this phenomenon are under investigation. HIV gp120/Env-specific antibody dependent (AD) cellular cytotoxicity (ADCC) was identified as a correlate of protection against HIV infection in the RV144 vaccine trial. If AD functions also play a role in controlling infection, then ECs and VCs would be expected to have more potent AD functions compared to PLWH who are untreated (UTP) or treated progressors (TP). We generated a novel HIV-infected target cell line that expressed Env in a closed conformation (siCEM cells) to 1) quantify Env-specific antibodies in plasma from EC, VC, UTP and TP and 2) to measure their AD functional competence. We tested plasma antibodies for four AD functions: activation of monocytes to induce phagocytosis (ADCP) and trogocytosis (ADCT), NK cell-mediated ADCC and activation of the complement cascade (ADCD). Anti-Env-specific antibodies from EC, VC and UTP demonstrated similar levels of AD functions that were higher than those in TP. ECs differed from all the other groups by having a more strongly correlated, polyfunctional anti-Env-specific AD response. The distribution of IgG subclasses and glycosylation patterns of anti-gp120-specific antibodies was measured. Multivariate dimensionality-reduction tools could not distinguish the four subject groups based on these parameters. Normalization of AD responses by anti-Env antibody concentration eliminated between-group differences in AD functions suggesting that quantity, and not the quality, of these antibodies drove the AD function potency. Reservoir size was measured by integrated HIV-DNA PCR. ADCC function was higher in controllers (EC+VC) who maintained an undetectable reservoir size than controllers with a detectable reservoir size.

260 Humanized Mice Transplanted with Thymic Tissues from Cardiac Surgeries as an Ethical and Practical Model to Study HIV Infection and Latency

Tram NQ Pham[1,2], Chloé Colas[1,3], Olga Volodina[2], Kathie Béland[3], Yuanyi Li[3], Frédéric Dallaire[2], William Lemieux[1,3], Aurélien Colamartino[1,3], Camille Tremblay-Laganière[1,3], Renée Dicaire[3], Jean Guimond[4], Natasha Patey[2,5], Suzanne Vobecky[6], Nancy Poirier[6], Éric Cohen[1,2], Élie Haddad[1,3,7]
[1]Department of Microbiology and Immunology, Université de Montréal, Montréal, Canada, [2]Montreal Clinical Research Institute, Montréal, Canada, [3]CHU Sainte-Justine Research Center, Montréal, Canada, [4]CSSS Jeanne Mance, Montréal, Canada, [5]CHU Sainte-Justine, Department of Pathology, Université de Montréal, Montréal, Canada, [6]CHU Sainte-Justine, Department of Cardiac Surgery, Montréal, Canada, [7]Department of Pediatrics, Université de Montréal, Montréal, Canada

Generating humanized mice with fully functional T cells currently relies on co-implantation of hematopoietic stem cells from fetal liver and autologous thymic tissue (BLT mice). However, access to such tissues has ethical and logistical challenges. Herein, we show that NOD/SCID/IL2rγnull mice humanized with cord blood-derived CD34+ cells and implanted in quadriceps with pediatric thymic tissues excised during cardiac surgeries (CCST mice) are an alternative to BLT mice. Our data reveal that T cells from CCST mice indeed originate from CD34+ progenitor cells; they proliferate efficiently in response to mitogenic stimulation ex vivo and are capable of rejecting allogeneic human leukemic cells in vivo. Despite having less T cells than BLT mice, CCST mice are just as susceptible to mucosal or intraperitoneal HIV-1 infection. Importantly, HIV-1-specific T-cell responses were significantly higher in CCST mice (median: 10.4% vs. 0.7%; $p<0.0001$ for CD8+ T cells and 3.9% vs. 0.7%; $p<0.01$ for CD4+ T cells, respectively $p < 0.0001$). As well, antiretroviral therapy (ART) robustly suppresses viremia and reduces the frequencies of cells carrying integrated HIV-1 DNA by up to 2 log in various tissues of CCST mice. Unsurprisingly, we observe a complete viral rebound in 67% of the animals by 2-4 weeks following ART interruption, suggesting the presence of HIV reservoirs. In conclusion, CCST mice represent an ethical and practical alternative to BLT mice, broadening the feasibility of utilizing humanized mice for research on HIV and other human diseases.

279 The Neovaginal Microbiome of Transfeminine Individuals

Hannah Wilcox[1], Bern Monari[2], Jason Hallarn[1], David Guan[1], David Zuanazzi[1], Greta Bauer[1], Jacques Ravel[2], Jessica Prodger[1]
[1]University Of Western Ontario, London, Canada, [2]University of Maryland School of Medicine, Baltimore, US

Background: In cisgender females (cF), the vaginal microbiota play a critical role in STI and HIV acquisition. An optimal cF vaginal microbiota is dominated by Lactobacillus spp., while microbiota dominated by diverse anaerobic bacteria are associated with inflammation and molecular bacterial vaginosis (BV). Local environmental factors shape the microbiome. This is demonstrated by the effect of circumcision on the microbiota composition of the coronal sulcus in cisgender men (cM) which increases water loss and oxygen tension, decreasing the abundance of strict anaerobes. Penile inversion vaginoplasty is the primary surgical technique used to create a neovagina however, the influence of surgical invagination, of what was penile tissue, on the microbiome of the transfeminine (tF) neovagina is poorly understood.

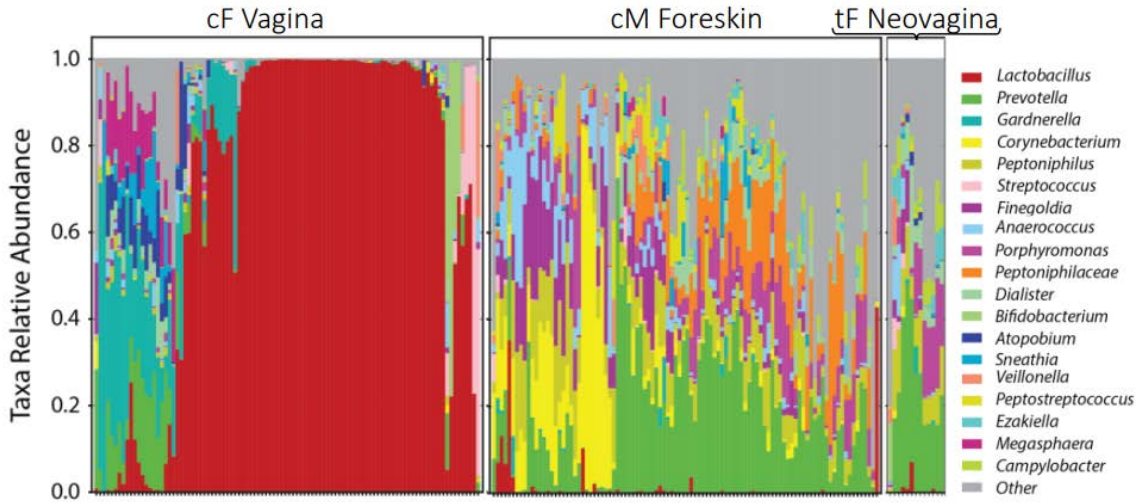
Methods: Self-collected neovaginal swabs from n=60 tF individuals who underwent vaginoplasty >1 year prior were analyzed. Microbiota were characterized through amplification, sequencing, and bioinformatic analyses of the V3-V4 region of the 16S rRNA gene. tF neovaginal microbiota profiles were compared to those of the reproductive aged cF vagina (n=100) and the sub-preputial space of uncircumcised cM (n=100).

Results: The microbiota of the tF neovagina did not resemble the Lactobacillus dominated or molecular BV-like cF vagina, but instead had high abundance of Gram-negative anaerobes (e.g., Prevotella, Porphyromonas, Anaerococcus, and Dialister).

Conclusions: Our early findings suggest the tF neovaginal microbiome has a low abundance of Lactobacillus spp. and instead is dominated by species like those found in the coronal sulcus of uncircumcised cM. Given the importance of the vaginal microbiota in HIV susceptibility of cF, future work will investigate relationships between microbiota, inflammation, and behavioural practices.

Supporting Document

Figure 1. Relative abundance bar plots of bacterial taxa in the vagina of reproductive aged cF (n=100), the sub-preputial space of cM (n=100) and the tF neovagina (n=13).



293 The Circadian Clock Machinery Regulates HIV Transcription in CD4+ T cells

Christ-Dominique Ngassaki-Yoka[1,2], Debashree Chatterjee[1,2], Yuwei Zhang[1,2], Tomas Raul Wiche Salinas[1,2], Laurence Raymond Marchand[1], Nicolas Cermakian[3], Jean-Pierre Routy[4], Laura Solt[5], Petronela Ancuta[1,2]
[1]Centre de recherche du CHUM, Montréal, Canada, [2]Département de microbiologie, infectiologie et immunologie, Faculté de médicine, Université de Montréal, Montréal, Canada, [3]Douglas Mental Health University Institute, McGill University,, Montréal, Canada, [4]McGill University Health Centre: Glen Site, Research Institute, Montréal, Canada, [5]Department of Immunology and Microbiology, The Scripps Research Institute, Jupiter, USA

Background: Current antiretroviral drugs block different steps of the viral replication cycle but not the transcription, a process under the control of host-cell transcription factors. In previous studies, we demonstrated that the transcriptional signature associated with HIV permissiveness in Th17 cells includes the circadian clock components/regulators BMAL1 and REV-ERBs. Of note, REV-ERBs act as transcriptional repressors of BMAL1 (a transcriptional activator binding to E-boxes in the HIV promoter) and RORC2 (the master regulator of Th17 polarization). Thus, we hypothesized that REV-ERBs regulate both BMAL1-mediated HIV replication and RORC2-mediated effector functions in Th17 cells.

Methods: To test this hypothesis, we used the REV-ERB agonists reported to be efficient in decreasing Th17-mediated autoimmune pathology in mice. A viral outgrowth assay (VOA) was performed with memory CD4+ T cells of ART-treated PLWH activated via CD3/CD28 in the presence/absence of the REV-ERB agonists. Lentiviral vectors were used to over express BMAL1 in primary CD4+ T cells. Cytokines and HIV-p24 levels were measured by ELISA. HIV-DNA integration was quantified by PCR.

Results: The REV-ERB agonists potently inhibited HIV replication in vitro and viral outgrowth in VOA. The antiviral effects coincided with decreased IL-17A and IFN-γ production. We also observed a decreased of RORC2 mRNA that we identified as a novel cell-specific target for HIV-1 therapy in Th17 cells. Single-round infection with a VSV-G-pseudotyped HIV showed decreased HIV-p24 expression/production but no differences in HIV-DNA integration in presence of REV-ERB agonists, indicative of an inhibitory effect post-integration, likely during transcription. Finally, we confirmed that BMAL1 overexpression increases HIV replication.

Conclusion: These results provide a strong rationale for further evaluating the possibility to therapeutically target REV-ERBs as a way to limit BMAL1-dependent HIV transcription and subsequently diminish chronic immune activation and non-AIDS co-morbidities during ART.

302 Humoral responses to one, two and three COVID-19 vaccine doses in people living with HIV receiving suppressive antiretroviral therapy (ART): a longitudinal study

Hope R Lapointe[1], Francis Mwimanzi[2], Peter K. Cheung[1,2], Yurou Sang[2], Fatima Yaseen[3], Olga Agafitei[1], Mari L. DeMarco[4,5], Marc G. Romney[5,6], Masahiro Niikura[2], Marianne Harris[1,7], Mark Hull[1,8], Mark A. Brockman[1,2,3], Zabrina L. Brumme[1,2]

[1]BC Centre for Excellence in HIV/AIDS, Vancouver, Canada, [2]Faculty of Health Sciences, Simon Fraser University, Burnaby, Canada, [3]Department of Molecular Biology and Biochemistry, Simon Fraser University, Burnaby, Canada, [4]Department of Pathology and Laboratory Medicine, Providence Health Care, , Vancouver, Canada, [5]Department of Pathology and Laboratory Medicine, University of British Columbia, Vancouver, Canada, [6]Division of Medical Microbiology and Virology, St. Paul's Hospital, Vancouver, Canada, [7]Department of Family Practice, Faculty of Medicine, University of British Columbia, Vancouver, Canada, [8]Department of Medicine, University of British Columbia, Vancouver, Canada

Background: Humoral responses to COVID-19 vaccines, particularly third doses, remain incompletely characterized in people living with HIV (PLWH).

Methods: We measured antibodies against the SARS-CoV-2 spike protein receptor-binding domain (RBD), ACE2 displacement and viral neutralization activities one month following the first COVID-19 vaccine dose, one, three and six months following the second dose, and one month after the third/booster dose in 99 adult PLWH and 152 controls. All PLWH were receiving suppressive ART, with median CD4+ T-cell counts of 715 (Q1-Q3 545-943) cells/mm3.

Results: After adjustment for sociodemographic, health and vaccine-related variables, HIV was associated with significantly lower anti-RBD antibody concentrations and ACE2 displacement activity, but not lower viral neutralization, after one vaccine dose. One and three months after the second dose however, HIV was no longer significantly associated with the magnitude of any humoral response after adjustment for these factors. Rather, older age, a higher burden of chronic health conditions, and having received two ChAdOx1 doses were associated with lower responses in both PLWH and controls. There was no significant correlation between the most recent or nadir CD4+ T-cell count and vaccine responses after two doses. Six months after the second dose, antibody concentrations had declined by an average of 0.7 log10 from those measured one month after the second dose. In both PLWH and controls, the booster dose increased antibody concentrations to an average of 0.4 log10 higher than peak responses after the second dose.

Conclusions: Early data indicate that PLWH with well-controlled viral loads on ART and CD4+ T-cell counts in a healthy range have robust humoral responses to second and third COVID-19 vaccine doses, similar to those of HIV-uninfected controls. Factors such as older age, co-morbidities, initial vaccine regimen and the rise of SARS-CoV-2 variants will influence when PLWH will benefit from booster doses.

324 Investigation of genetic integrity and longevity among HIV proviruses persisting during long-term ART

Natalie Kinloch[1,2], Winnie Dong[2], Don Kirkby[2], Daniel MacMillan[2], Aniqa Shahid[1,2], Hanwei Sudderuddin[2,3], Bruce Ganase[2], Marianne Harris[2], Chanson J. Brumme[2,4], Mark A. Brockman[1,5], Zabrina L. Brumme[1,2]
[1]Faculty of Health Sciences, Simon Fraser University, Burnaby, Canada, [2]British Columbia Centre for Excellence in HIV/AIDS, Vancouver, Canada, [3]Experimental Medicine Program, University of British Columbia, Vancouver, Canada, [4]Department of Medicine, University of British Columbia, Vancouver, Canada, [5]Department of Molecular Biology and Biochemistry, Faculty of Science, Simon Fraser University, Burnaby, Canada

Background: Understanding the longevity of proviruses persisting during ART is critical to HIV eradication, but few such studies have discriminated between intact and defective proviruses. We in-depth characterize the genetic features and inferred ages of proviruses persisting during long-term ART in two individuals.

Methods: Longitudinal pre-ART plasma HIV RNA nef sequences were collected by single-template sequencing from participants P1 and P2, over 4.75 and 2.5 years, respectively. Single-template near-full-length proviral sequences were collected at a single time point ≥9 years after ART initiation and classified as intact or defective. Maximum-likelihood phylogenies were constructed from pre-ART and intact proviral nef sequences, where the ages of the latter sequences were inferred using a root-to-tip regression approach.

Results: A total of 122 and 221 pre-ART nef sequences, and 733 and 386 near-full-length proviruses were recovered from P1 and P2, respectively. Defective proviruses dominated in both individuals (98%). Heavily-deleted proviruses made up most of P2's proviral pool (90%), while P1's was extensively hypermutated (53%). In both individuals, gag (P1-27%, P2-38%) and nef (P1-16%, P2-24%) were most likely to be intact. Clonal proviruses made up 17% (P1) and 36% (P2) of sampled sequences. Age inference was performed on proviruses with intact nef. Of these, 97% (P1) and 78% (P2) were estimated to have integrated in the two years pre-ART, consistent with skewing of the proviral pool towards younger sequences. Nevertheless, proviruses dating to the first year of infection were recovered in both participants. No difference was observed in the inferred age distributions of intact and defective proviruses in either participant ($p>0.4$).

Conclusion: Genetic features of proviruses persisting on ART can vary widely between individuals. The lack of difference in the ages of intact and defective proviruses suggests that genetic integrity is not the most critical feature that modulates proviral longevity after many years on ART.

Clinical Sciences Oral Abstracts / Sciences cliniques eposés oraux

8 Two-tier care pathways for liver fibrosis associated to non alcoholic fatty liver disease in 1749 HIV mono-infected patients

Giada Sebastiani[1], Jovana Milic[2], Dana Kablawi[1], Claudia Gioe[3], Al Shaima Al Hinai[1], Adriana Cervo[2], Bertrand Lebouche[1], Sahar Saeed[4], Philip Wong[1], Marc Deschenes[1], Antonio Cascio[3], Giovanni Mazzola[3], Giovanni Guaraldi[2]
[1]McGill University Health Centre, Montreal, Canada, [2]University of Modena and Reggio Emilia, Modena, Italy, [3]University of Palermo, Palermo, Italy, [4]Washington University School of Medicine, St. Louis, United States

Background: Non-alcoholic fatty liver disease (NAFLD) affects 35% of people with HIV (PWH). Significant liver fibrosis develops in 15% of these PWH. Developing strategies to identify PWH at risk for NAFLD-related liver fibrosis related is imperative to reduce complications. Transient elastography (TE) is not widely accessible to evaluate liver fibrosis. A two-tier pathway using simple fibrosis biomarkers initially could reduce the need for specialist tests like TE.

Methods: A two-tier care pathway was applied to three prospective cohorts of PWH without viral hepatitis in Canada and Italy who underwent screening for NAFLD. Significant liver fibrosis was defined as TE reading >7.1 kPa. Five simple fibrosis biomarkers (FIB-4<1.3, BARD score 0-1, NAFLD fibrosis score<-1.455, AST:ALT ratio<0.8 and APRI<0.5) were applied as first-tier tests to exclude significant liver fibrosis and evaluate the reduction in TE referrals and costs.

Results: Of the included 1749 PWH (mean age 50.2 years, prevalence of diabetes 34%), 15.1% had significant liver fibrosis by TE. Application of simple fibrosis biomarkers as first tier tests would have resulted in 24.9-86.3% decrease in TE referrals (see Table). After adjusting for age, sex, diabetes, CD4 cell count, BMI (adjusted odds ratio [aOR] 1.12 (95% CI 1.08-1.17) and triglycerides (aOR 1.26, 95% CI 1.11-1.44) were independent predictors of discordance for APRI<0.5 with TE>7.1.

Conclusion: A two-tier pathway could save over 80% of TE examinations and related costs, helping resource optimization in HIV medicine. Patients stratified as low risk by APRI but with metabolic comorbidities should be considered for referral for TE examination.

Supporting Document

Table. Cost analysis of potential direct cost savings by the two-tier pathway, estimated using Canadian data.

	APRI	**FIB-4**	**NAFLD fibrosis score**	**BARD score**	**AST:ALT ratio**
Decrease in TE referral (%)	86.3	63.0	51.2	24.9	26.2
Discordance high LSM/ low biomarker (%)	11.7	11.0	8.5	15.4	19.5
Direct cost of serum biomarker per 100 PWH ($)	1700	1700	2200	1000	1000
TE cost saved per 100 PWH ($)	10788	7875	6400	3113	3275
Total direct cost saved per 100 PWH ($)	9088	6175	4200	2113	2275

Legend: All dollar values are 2019 Canadian dollars.
Abbreviations: APRI, AST-to-Platelets Ratio Index; FIB-4, fibrosis-4; LSM, liver stiffness measurement; PWH, people with HIV; TE, transient elastography.

15 Non-invasive Prediction of Liver-related Events and Death in People with HIV

Amine Benmassaoud[1], Juan Macias[2], Anaïs Corma-Gomez[2], Giovanni Guaraldi[3], Jovana Milic[3], Jürgen Rockstroh[4], Kathrin Van Bremen[4], Emmanuel Tsochatzis[5], Akhilesh Mulay[5], Jennifer Price[6], Lucy Garvey[7], Maud Lemoine[7], Dana Kablawi[1], Bertrand Lebouche[1], Marina Klein[1], Christoph Boesecke[4], Filippo Schepis[3], Sanjay Baghani[5], Graham Cooke[7], Annalisa Berzigotti[8], Kyoko Hirose[6], Juan Pineda[2], Sahar Saeed[9], Victor De Ledinghen[10], **Giada Sebastiani[1]**
[1]McGill University Health Centre, Montreal, Canada, [2]Hospital Universitario de Valme, Seville, Spain, [3]University of Modena and Reggio Emilia, Modena, Italy, [4]Bonn University Hospital, Bonn, Germany, [5]Royal Free London NHS Foundation Trust, London, United Kingdom, [6]University of California San Francisco, San Francisco, United States, [7]Imperial College Healthcare NHS Trust, London, United Kingdom, [8]UVCM, Inselspital, Bern University Hospital, Bern, Switzerland, [9]Department of Internal Medicine - Infectious Disease, Washington University School of Medicine, Institute for Public Health, Center for Dissemination and Implementation, St Louis, United States of America, [10]Centre Hospitalier Universitaire de Bordeaux, Bordeaux, France

Background : People with HIV (PWH) are at risk for compensated advanced chronic liver disease (cACLD) and liver-related events. Non-invasive tools, including liver stiffness measurement (LSM) by transient elastography, are used to identify patients with cACLD at risk of hepatic decompensation and mortality, but these remain not validated in PWH.

Method: This was an international multicenter cohort study including PWH with available LSM and no previous hepatic decompensation. Non-invasive tests included LSM, LSM to Platelets (LPR), LSM/spleen diameter-to-platelets ratio (LSPS), and Portal Hypertension risk score (PHRS). Non-invasive tests were assessed using area under the curve (AUC) and Cox-regression analysis to predict events. Patients were stratified in four groups based on thrombocytopenia (platelets≤150 G/L) and presence of cACLD (LSM≥10kPa): group1=LSM<10kPa/platelets>150; group2=LSM<10kPa/Platelets≤150; group3=LSM≥10kPa/Platelets>150; group4=LSM≥10kPa/Platelets≤150. Incidence of death and liver-related events (ascites, encephalopathy, variceal bleeding, hepatocellular carcinoma) was assessed.

Results : We included 1488 PWH (mean age 48.5 years, 64.9% co-infected with hepatitis C). When compared to group1, the incidence rate ratio of liver-related events was 9.79 (95%CI 2.4-47.7) for group2, 17.22 (95%CI 5.9-73.3) for group3, and 44.79 (95%CI 16.7-183.1) for group4. Based on AUC, LSM [0.828 (95%CI 0.776-0.881)], LPR [0.831 (95%CI 0.784-0.878)], LSPS [0.832 (95%CI 0.785-0.884)], and PHRS [0.835 (95%CI 0.785-0.879)] all performed well to predict any event. Using separate models for each test, LSM, LPR, LSPS, and PHRS remained independent predictors of any event (see Table).

Conclusion: In PWH, non-invasive tools are predictive of liver-related events and death, particularly when used in combination. The combination of LSM, platelet count and spleen diameter provides better assessment of this risk as compared to single non-invasive tools.

Supporting Document

Table – Multivariate Cox regression analysis for development of any clinical event (liver-related events and death). Thresholds of non-invasive tests (LSM, LPR, LSPS and PHRS) were selected based on Youden's index.

Variables	Hazard Ratio (95% CI)	p-value
Model 1		
LSM above 15.9kPa	**4.087 (95%CI 1.955-8.543)**	**<0.001**
Gender, ref male	0.895 (95%CI 0.463-1.727)	0.740
Duration of HIV, per year	1.009 (95%CI 0.976-1.042)	0.601
Spleen diameter, per cm	**1.102 (95%CI 1.006-1.207)**	**0.037**
Platelets, per unit	0.998 (95% CI 0.993-1.004)	0.541
Co-infection status, ref HIV-monoinfection	1.384 (95%CI 0.584-3.280)	0.460
Model 2		
LPR above 5.49	**7.279 (2.585-20.501)**	**<0.001**
Gender, ref male	0.813 (0.419-1.576)	0.539
Duration of HIV, per year	1.000 (0.968-1.033)	0.983
Spleen diameter, per cm	**1.113 (1.019-1.215)**	**0.017**
Co-infection status, ref HIV-monoinfection	1.257 (0.560-2.821)	0.579
Model 3		
LSPS above 0.60	**11.969 (4.003-35.789)**	**<0.001**
Gender, ref male	0.792 (0.411-1.529)	0.488
Duration of HIV, per year	1.001 (0.970-1.034)	0.934
Co-infection status, ref HIV-monoinfection	1.367 (0.615-3.040)	0.443
Model 4		
PHRS above 0.54	**5.268 (2.569-10.801)**	**<0.001**
Duration of HIV, per year	1.008 (0.975-1.041)	0.654
Co-infection status, ref HIV-monoinfection	1.715 (0.766-3.841)	0.190

16 Evaluating Associations Between in Utero HIV/ART Exposure and Pubertal Statusin Children Who are HIV Exposed but Uninfected

Lena Serghides[1], Denise Jacobson[2], Jessica Lee[2], Mitchell E. Geffner[3], Elizabeth J. McFarland[4], Linda DiMeglio[5], Kathleen M. Powis[2], Paige L. Williams[2], Jennifer Jao[6], for the Pediatric Cohorts Study

[1]University Health Network, Toronto, Canada, [2]Harvard TH Chan School of Public Health, Boston, United States, [3]Children's Hospital Los Angeles, Los Angeles, United States, [4]University of Colorado, Aurora, United States, [5]Indiana University, Indianapolis, United States, [6]Northwestern University, Chicago, United States

Background: Many factors influence pubertal onset including *in utero* exposures to medications and infections. We investigated associations of in utero antiretroviral exposures and maternal HIV severity with pubertal status at age 9 years in children who are HIV exposed but uninfected (CHEU).

Methods: CHEU in the Surveillance Monitoring for ART Toxicities study of the Pediatric HIV/AIDS Cohort Study with a Tanner stage (TS) assessment at age 9 (±4mo) were included. Puberty was defined as present when TS≥2 for each indicator (girls: breasts/pubic hair; boys: testicular volume/pubic hair). Exposures of interest were: protease inhibitor (PI) exposure at ≤30 weeks' gestation, maternal CD4 and HIV viral load in pregnancy, and child body mass index (BMI) >95th percentile at 9 years. Log-binomial regression models were fit to estimate relative risks.

Results: 227 CHEU were included (114 girls, 113 boys). 77% were exposed to PIs at ≤30 weeks' gestation. A higher proportion of females (34.2% breast, 31.9% pubic hair, 27.4% both) than males (16.8% testicular volume, 13.3% pubic hair, 12.4% both) had attained TS≥2. Factors associated with the child having begun puberty differed by sex (Table). Among males, CHEU with PI exposure were less likely to have reached TS≥2, while higher maternal viral load in pregnancy increased the likelihood of reaching TS≥2.

Conclusions: Maternal HIV viral load in pregnancy was associated with presence of puberty at age 9 in males, but not in females. Further confirmatory and mechanistic studies are warranted.

Supporting Document

Table: Adjusted associations of PI exposure, CD4 count, and viral load in pregnancy, and child BMI with Tanner stage ≥2 for each indicator by sex.

Exposure			Male testicular volume			Male pubic hair	
		N	Adjusted RR (95% CI)	p-value	N	Adjusted RR (95% CI)	p-value
PI exposure ≥30 weeks[1]	No Yes	16 74	REF 0.23 (0.05, 1.05)	0.06	16 74	REF 0.18 (0.03, 1.12)	0.07
CD4 count in pregnancy[2]	>200 cells/mm^3 ≤200 cells/mm^3	81 15	REF 1.51 (0.37, 6.16)	0.56	81 15	REF 3.11 (0.58, 16.54)	0.18
Viral load in pregnancy[2]	1-unit increase in log RNA	96	1.93 (1.11, 3.33)	0.02	96	2.00 (1.05, 3.79)	0.03
Child BMI[3]	≤95th percentile >95th percentile	69 28	REF 2.09 (0.75, 5.86)	0.16	69 28	REF 2.65 (0.76, 9.27)	0.13
			Female breasts			**Female pubic hair**	
			Adjusted RR (95% CI)	p-value		Adjusted RR (95% CI)	p-value
PI exposure ≥30 weeks[1]	No Yes	18 70	REF 0.85 (0.35, 2.06)	0.72	18 69	REF 1.19 (0.47, 3.05)	0.71
CD4 count in pregnancy[2]	>200 cells/mm^3 ≤200 cells/mm^3	81 13	REF 0.88 (0.30, 2.59)	0.82	80 13	REF 0.91 (0.31, 2.71)	0.87
Viral load in pregnancy[2]	1-unit increase in log RNA	94	0.87 (0.64, 1.19)	0.40	93	0.88 (0.64, 1.21)	0.42
Child BMI[3]	≤95th percentile >95th percentile	65 30	REF 1.65 (0.98, 2.78)	0.06	64 30	REF 1.30 (0.73, 2.32)	0.37

[1] Adjusted for age at Tanner assessment, race/ethnicity, maternal pre-pregnancy BMI, household income, and earliest CD4 count <30 weeks' gestation.
[2] Adjusted for age at Tanner assessment, race/ethnicity, maternal pre-pregnancy BMI, and household income.
[3] Adjusted for age at Tanner assessment, race/ethnicity, and household income.
BMI=body mass index, CI=confidence interval, PI=protease inhibitor, RR=relative risk

17 Effectiveness and Safety of Bictegravir/emtricitabine/tenofovir alafenamide (B/F/TAF) in People Living with HIV in Canada: 24-month (24M) Results of BICSTaR

Benoit Trottier[1], Alex Wong[2], Hugues Loemba[3], Joss De Wet[4], Ken Logue[5], David Thorpe[6], Harout Tossonian[7], Taban Saifi[7], René-Pierre Lorgeoux[7], Jason Brunetta[8]
[1]Clinique de Médecine Urbaine du Quartier Latin Montreal, Montreal, Canada, [2]Department of Medicine, University of Saskatchewan, Regina, Canada, [3]University of Ottawa Health Services, Ottawa, Canada, [4]Spectrum Health, Vancouver, Vancouver, Canada, [5]St. Clair Medical Associates, Toronto, Canada, [6]Gilead Sciences Europe Ltd, Uxbridge, United Kingdom, [7]Gilead Sciences Inc, Mississauga, Canada, [8]Maple Leaf Medical Clinic, Toronto, Canada

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 with HIV in Canada. 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 24M visit.

159 persons (10 TN/149 TE) were included in the analysis (August 2021). Most were male (88%), white (72%) and 51% were ≥50 years old. Baseline comorbidities were prevalent (90%), including neuropsychiatric disorders (40%), hyperlipidemia (30%), and hypertension (22%). Amongst TE persons, 68%/22%/12% switched from INSTI, NNRTI, PI regimens to B/F/TAF, respectively; 46% switched from TDF-containing regimens. 19 participants (13%; 2 TN and 17 TE) had baseline primary resistance (8% NRTI [6 M184V/I, 1 K65R] and 6% NNRTI [7 K103N/S] mutations). Of those with HIV-1 RNA data at 24M (n=126), 8/8 (100%) TN and 117/118 (99%) TE had HIV-1 RNA <50 copies/ml, with no emergent resistance to the components of B/F/TAF. Median CD4+ cell counts (cells/µl) increased in TN (355 to 699) and were stable in TE (588 to 610) from baseline to 24M. Persistence with B/F/TAF at 24M was 89%; 3 TN and 15 TE discontinued (TN: 2 participant/investigator decision, 1 death; TE: 5 AEs, 5 participant/investigator decision, 1 death, 1 lack of efficacy). No discontinuations occurred due to renal/bone/hepatic AEs and no recorded serious DRAEs. DRAEs occurred in 10 TE participants (7%), with weight increase (n=4) and psychiatric symptoms (abnormal dreams [n=1], anxiety [n=1] and major depression [n=1]) being most common. Median (Q1, Q3) weight change was +1.1 kg (−0.9, 4.3) for TE (n=99), with modest BMI changes +0.4 kg/m2 [−0.3, 1.4].

B/F/TAF was highly effective and well-tolerated through two years in this real-world Canadian cohort of adults living with HIV and multiple comorbidities.

24 Second Generation Integrase Inhibitors Induce Toxicity and Differentiation in Human Embryonic Stem Cell Models

Marie-Soleil Smith[1,2], Ronil Patel[1], Lou Martineau[3], Hélène Côté[1,2,4]
[1]Department of Pathology and Laboratory Medicine, University of British Columbia, Vancouver, Canada, [2]Centre for Blood Research, University of British Columbia, Vancouver, Canada, [3]Ecole d'Ingénieurs de l'Université d'Angers, Angers, France, [4]Women's Health Research Institute, Vancouver, Canada

Each year, ~1.1 million children are exposed in utero to ARVs, but their safety is not fully characterized during pregnancy. The Tsepamo study suggests that exposure to dolutegravir (DTG) from conception may be detrimental. Our objective was to characterize the effects of InSTI exposure on human embryonic stem cells (hESCs), with respect to cellular health, and markers of pluripotency and differentiation.

H9 (n=6) and CA1S (n=3) hESCs were exposed to 0.1% DMSO or DTG, cabotegravir (CAB), bictegravir (BIC), or raltegravir (RAL) at 0.01X-1XCmax (peak plasma concentrations). After three days, hESCs were assessed for viability, apoptosis, and for the markers of differentiation SSEA-3, and TRA-1-60 via flow cytometry. HESCs exposed to 0.5XCmax (n=3) were analyzed for expression of differentiation genes by RT-qPCR. Measures were compared between InSTIs and DMSO by paired t-tests.

H9 hESCs exposed to ≥0.5XCmax DTG, CAB, or BIC exhibited ≥2-fold decreased proliferation ($p \leq 0.04$). Exposure to DTG or BIC at 1XCmax severely reduced viability ($p < 0.001$) and increased apoptosis ($p \leq 0.001$). Similar cell toxicity trends were seen in CA1S hESCs exposed to ≥0.5XCmax DTG, CAB, or BIC. H9 hESCs exposed to ≥0.5XCmax DTG, CAB, or BIC showed decreased SSEA-3 (≥20%, $p \leq 0.02$) and TRA-1-60 (≥20%, $p \leq 0.03$) expression and increased early mesendoderm lineage gene expression. CA1S hESCs exposed to ≥0.5XCmax DTG or CAB showed ≥75% decrease in SSEA-3, but no effect on TRA-1-60 or differentiation marker gene expression. In both hESC lines, RAL did not induce any cytotoxicity or differentiation, regardless of dose exposure.

Even at sub-pharmacological concentrations, some InSTIs induce cytotoxicity and differentiation in hESCs. Given their common use by women of reproductive age, it is imperative to elucidate their long-term safety in the context of pregnancy. Our data also indicate that RAL shows a safer profile in this model, a reassuring finding that warrants further investigation.

41 Menopause in women living with and without HIV in two studies: Children and Women: AntiRetrovirals and Markers of Aging (CARMA) and the British Columbia CARMA-CHIWOS Collaboration (BCC3)

Shayda Alexis Swann[1,2], Elizabeth M King[2,3], Amber R Campbell[2,4,5], **Shelly Tognazzini**[6], Helene CF Cote[2,5,7], Angela Kaida[2,6], Sofia LA Levy[2,4,5], Valerie Nicholson[6,8], Neora Pick[2,4], Tetiana Povshedna[5,7], Melanie CM Murray[2,4,9], on behalf of the CARMA (CIHR, CTN 277) and BCC3 (CIHR, CTN 335) Study Teams

[1]Department of Experimental Medicine, University of British Columbia, Vancouver, Canada, [2]Women's Health Research Institute, British Columbia Women's Hospital and Health Centre, Vancouver, Canada, [3]Department of Medicine, University of British Columbia, Vancouver, Canada, [4]Oak Tree Clinic, Vancouver, Canada, [5]Department of Pathology and Laboratory Medicine, University of British Columbia, Vancouver, Canada, [6]Faculty of Health Sciences, Simon Fraser University, Burnaby, Canada, [7]Centre for Blood Research, University of British Columbia, Vancouver, Canada, [8]Epidemiology and Population Health, BC Centre for Excellence in HIV/AIDS, Vancouver, Canada, [9]Division of Infectious Diseases, University of British Columbia, Vancouver, Canada

Background: Studies suggest that women living with HIV (WLWH) reach menopause earlier than negative controls. However, this may be confounded by hypothalamic amenorrhea, which occurs frequently in WLWH. Follicle stimulating hormone (FSH) can distinguish menopause from hypothalamic amenorrhea. Herein, we compare age at menopause in WLWH and controls by self-report versus biochemical confirmation (FSH).

Methods: Cross-sectional demographic and medical data were obtained for a subset of women enrolled in CARMA and BCC3. Participants aged ≥35 years and sex-assigned female at birth were included. Women with hysterectomy, bilateral oophorectomy, or hormonal therapy use were excluded. Menopause status was determined by 1) self-report and 2) age at last menstrual period and serum FSH (biochemical confirmation). Participants were compared using descriptive statistics. The Chi2 test was used to compare counts of premenopausal and menopausal women by self-report vs. biochemical confirmation.

Results: In total, 139 WLWH and 104 controls are included in this interim analysis, of whom 51 WLWH and 49 controls were menopausal. WLWH had lower income, less education, higher parity, and higher rates of hepatitis C infection than controls. Among WLWH, 81.0% had a viral load <40 copies/ml. Self-reported reproductive phase was concordant with biochemical data in 83.8% of WLWH compared with 95.0% of controls (p=0.008). By self-report, mean age at menopause was 48.7 ± 5.7 years in WLWH and 50.2 ± 4.8 years in controls. When FSH measurements were considered, menopause ages were similar (WLWH: 50.1 ±4.3 vs. controls: 50.2 ± 4.9 years).

Conclusion:
This interim analysis suggests no difference in menopause age between WLWH and controls using biochemical confirmation, compared to self-report where WLWH appeared to have slightly earlier menopause. If confirmed in final analyses, these results call to question whether WLWH experience earlier menopause and suggest biochemical confirmation could be an important research tool when assessing menopause in WLWH.

77 First impressions matter: Differences in experiences with first PrEP-related healthcare encounters between gay, bisexual and other men who have sex with men (GBM) on PrEP and GBM who discontinued PrEP

Oscar Javier Pico Espinosa[1], Mark Hull[2], Paul MacPherson[3], Daniel Grace[4], Mark Gaspar[4], Nathan Lachowsky[5], Kevin Woodward[6], Saira Mohammed[2], Karla Fisher[7], Simon Rayek[8], Camille Arkell[9], Tyllin Cordeiro[10], Garfield Durrant[11], Warren Greene[12], David Hall[13], Matthew Harding[14], Jody Jollimore[15], Marshall Kilduff[16], John Maxwell[17], Leo Mitterni[18], Eric Peters[19], Robinson Truong[1], Darrell Tan[1]

[1]St. Michael's Hospital, Unity Health Toronto, Toronto, Canada, [2]BC Centre for Excellence in HIV/AIDS, Vancouver, Canada, [3]University of Ottawa, Ottawa, Canada, [4]University of Toronto, Toronto, Canada, [5]University of Victoria, Victoria, Canada, [6]McMaster University, Hamilton, Canada, [7]Toronto General Hospital, Toronto, Canada, [8]Health Initiative for Men, Vancouver, Canada, [9]Canadian AIDS Treatment Information Exchange (CATIE), Toronto, Canada, [10]Alliance for South Asian AIDS Prevention (ASAAP), Toronto, Canada, [11]Black Coalition for AIDS Prevention (Black CAP), Toronto, Canada, [12]Canadian Aboriginal AIDS Network, Fort Qu'Appelle, Canada, [13]Vancouver Coastal Health, Vancouver, Canada, [14]MAX Ottawa, Ottawa, Canada, [15]Community-Based Research Centre, Vancouver, Canada, [16]AVI Health and Community Services, Victoria, Canada, [17]AIDS Committee of Toronto, Toronto, Canada, [18]Hassle Free Clinic, Toronto, Canada, [19]The Gay Men's Sexual Health Alliance, Toronto, Canada

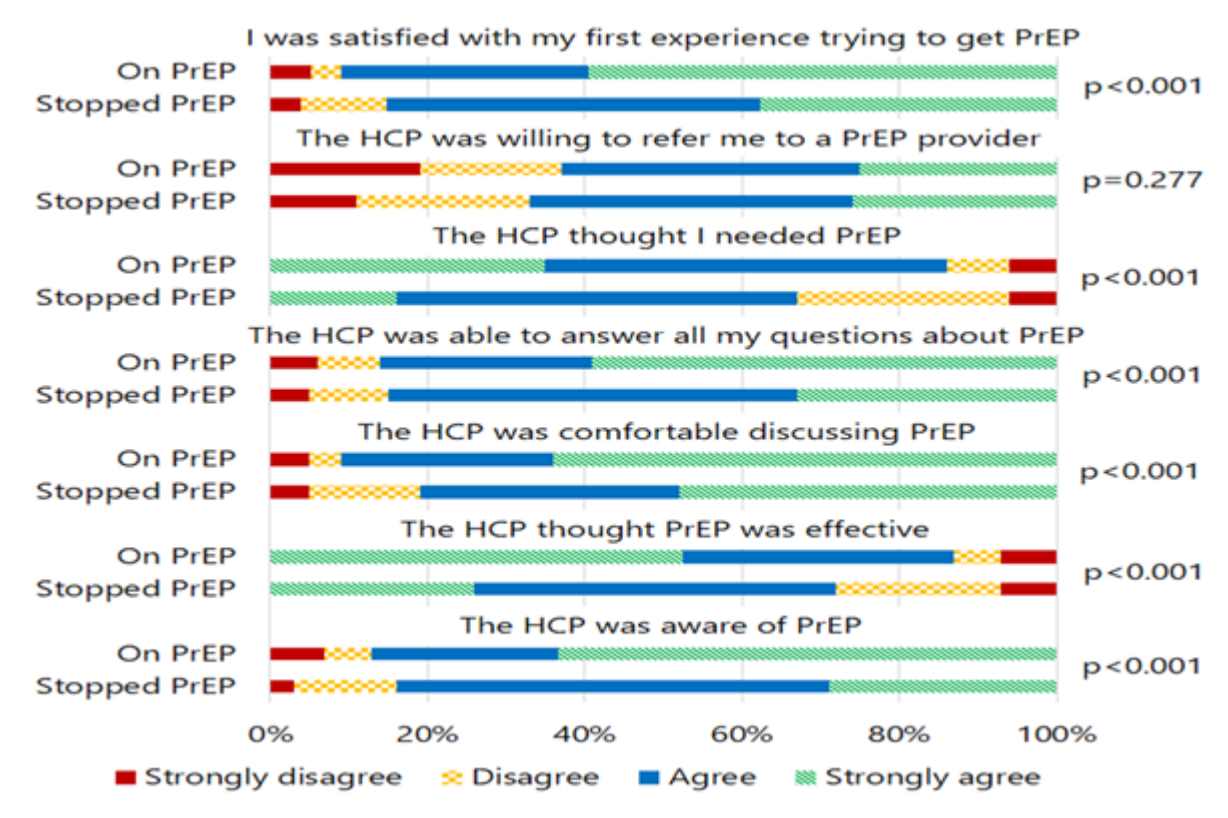
Background: Healthcare-related factors may influence future PrEP use. We explored whether first experiences with PrEP-related healthcare differed between GBM on PrEP and GBM who discontinued PrEP.

Methods: We used data from the PrEP implementation project (PRIMP), a cross-sectional survey from July 2019 to August 2020 in Toronto, Ottawa, Hamilton, Vancouver and Victoria. Our analytic sub-sample was GBM who met criteria for PrEP according to the Canadian PrEP guidelines. We asked about their first experience seeking PrEP.

Results: Of 522 respondents, 147 had stopped PrEP and 375 were taking PrEP. GBM who discontinued PrEP were younger than those taking PrEP (30.3 (SD=7.8) vs. 35.3 years (SD=10), p<0.001) and earned less (26% earned >$60.000/year versus 45%, p<0.001). Those who discontinued PrEP were more likely to have sought PrEP from their family doctor (instead of a sexual health clinic) more often than those who continued PrEP (42% vs 27%, p=0.004). Participants who stopped PrEP waited a median of 11.5 days (IQR= 7-16) for their first prescription versus 19 days (IQR= 7-60) for those currently on PrEP (p<0.001).
Those still taking PrEP felt more comfortable discussing their sexual health with their healthcare provider (HCP) (86% vs 75%, p=0.003) and were more often instructed to take PrEP daily (91%) versus on-demand (58%, p<0.001). Participants currently on PrEP reported greater satisfaction with their first experience seeking PrEP (Figure).

Conclusion: GBM who discontinued PrEP were less satisfied with PrEP-related healthcare than GBM who stayed on PrEP. Initial experiences seeking PrEP may have lasting implications on PrEP persistence.

Supporting Document



84 Trends in Illicit Drug Use Among Patients Recently Treated for Hepatitis C in British Columbia, Canada

Lauren Harrison[1], Kat Dolguikh[1], Zoran Barazanci[1], Wendy Zhang[1], Shaughna Cooper[1], Jessica Ly[1], Rolando Barrios[1,2], Julio SG Montaner[1,3], Kate Salters[1,4]
[1]BC Centre for Excellence in HIV/AIDS, Vancouver , Canada, [2]Vancouver Coastal Health, Vancouver, Canada, [3]University of British Columbia, Vancouver, Canada, [4]Simon Fraser University, Burnaby, Canada

Introduction: During the COVID-19 pandemic, disruptions in harm reduction services, housing, and mental health care are suspected to have exacerbated substance use risks amid a dynamic illicit drug market. Understanding and responding to trends in drug use is needed to meet the needs of under-served clients at risk of HIV and HCV infection.

Methods: The Per-SVR study is a prospective cohort study that assesses re-infection rates, health care engagement and outcomes among adults living in British Columbia, Canada who have recently completed direct-acting antiviral (DAA) HCV therapy. Utilizing Per-SVR data (survey and urine drug screen (UDS)), we included participants who completed at least one interview before July 1st, 2021 with a positive UDS sample. A trend analysis of the proportional use of substances by year was performed using a generalized estimating equation model. Participants who completed surveys between March 2019 – March 2020 and July 2020 – July 2021 were included in a pre-post COVID sub-analysis (t-test).

Results: We identified 164/230 participants with a positive UDS at baseline (median age: 52 years (44-58), 65.9% male, 11.0% homeless in previous 3 months). In the annual trend analysis (2017-2021), the proportion of clients using marijuana decreased (66.7% 2017 vs 46.3% 2021, p=0.042) while amphetamines (18.2% 2017 vs 41.5% 2021, p=0.022) and ecstasy (3.0% 2017 vs 36.6% 2021, p <0.001) increased. Fentanyl was the only substance that increased (20.9% pre-COVID vs. 32.3% post-COVID, p=0.008) in the pre-post COVID analysis (n=129). There was no significant change in self-reported overall non-injection substance use and injection substance use pre-post COVID.

Conclusions: Temporal trends in drug use show that stimulants account for an increasing proportion of substances used while the proportion of participants using marijuana has decreased. The proportion of participants using fentanyl has increased since the start of COVID-19, highlighting important implications for harm reduction services.

85 Socioecological Analysis of HIV Pre-Exposure Prophylaxis (PrEP) Stigma in the Ontario PrEP (ON-PrEP) Cohort Study: A Qualitative Analysis

Adrian Foster[1,2], Nila Parvaresh[2], Ryan Lisk[3], Paul MacPherson[4], David Knox[5], Kevin Woodward[6], Jeff Reinhart[7], John MacLeod[8], Isaac Bogoch[9], Deanna Clatworthy[10], Mia Biondi[11], Trevor Hart[1,12], Darrell Tan[2,9]
[1]University Of Toronto, Toronto, Canada, [2]St. Michael's Hospital, Toronto, Canada, [3]AIDS Committee of Toronto, Toronto, Canada, [4]The Ottawa Hospital, Ottawa, Canada, [5]Maple Leaf Medical Clinic, Toronto, Canada, [6]Hamilton PrEP Clinic, Hamilton, Canada, [7]Sherbourne Health Centre, Toronto, Canada, [8]790 Bay Street Clinic, Toronto, Canada, [9]University Health Network, Toronto, Canada, [10]ARCH Clinic, Guelph, Canada, [11]Western University, London, Canada, [12]Ryerson University, Toronto, Canada

Background: PrEP stigma is an expression of social power which uses stereotypes (e.g., promiscuity) to devalue PrEP users. Using thematic analysis, we characterized participants' experiences of PrEP stigma within the Ontario PrEP Cohort Study.

Methods: Adults initiating or using PrEP completed 6-monthly electronic questionnaires for up to two years from 02/2018-06/2021, including annual questions about anticipated and enacted PrEP stigma. Using inductive thematic analysis techniques, we developed a codebook of socioecological PrEP stigma themes based on participants' responses and pre-existing literature. Participants' written responses were then iteratively coded by theme, with disagreements resolved by a third author.

Results: Of 167 participants who provided a written description of PrEP stigma, median age was 35.6 (IQR, 29.3-41.2) years, 154 (92.2%) identified as male, and 142 (85.0%) as gay. Across 211 responses, 18 themes of PrEP stigma were identified across three socioecological levels: community, interpersonal, and institutional. Community-level stigma was the most common, with themes including: promiscuity (38.4% of all 211 responses), risk promotion (25.6%), general (13.7%), HIV-related stigma (4.2%), PrEP efficacy distrust (2.8%), responsibility to educate peers (2.8%), and homophobia/transphobia (0.0%). Interpersonal-level stigma was the next most common, with themes being: general (11.3%), risk promotion (10.9%), HIV-related stigma (6.6%), promiscuity (6.1%), PrEP efficacy distrust (5.7%), de-stigmatization (reverse-coded) (5.2%), and homophobia/transphobia (2.4%). Institutional-level stigma was the least common socioecological level, with themes being: healthcare discrimination (2.8%), healthcare distrust (2.4%), governmental distrust (1.9%), and governmental discrimination (0.0%).

Conclusion: While PrEP users most commonly reported stigmatization related to promiscuity and risk-promotion, other expressions of stigma (e.g., HIV-related stigma) were not rare. By identifying these varying expressions of PrEP stigma, this research can help address stigmatization by providing services a socioecological framework of how PrEP users experience stigma.

100 Developing Consensus Guidelines on Infant Feeding for WLWH

Sarah Khan[1], **Kara Tsang**, Logan V. Kennedy, Stanley Read, Mark Yudin, Isabelle Boucoiran, Breklyn Bertozzi, Brittany Cameron, Muluba Habanyama, Sandrine Nkubito, Fatima Kakkar, Jason Brophy, Ari Bitnun
[1]McMaster University, Hamilton, Canada

Background: Providing comprehensive infant feeding guidance to families affected by HIV is complex and requires a multidisciplinary approach. While exclusive formula feeding remains the preferred recommendation for infants born to women living with HIV (WLWH) in high-income countries and is the current recommendation in Canadian guidelines, a more nuanced approach that includes the informed decision to breastfeed under certain circumstances is emerging in many resource-rich countries.

Methods: The Canadian Pediatric & Perinatal HIV/AIDS Research Group (CPARG) hosted a CIHR-funded meeting in 2016 to develop consensus among multidisciplinary providers around counselling and recommendations for infant feeding. After presentations by adult and pediatric health care providers, basic scientists, and community-based researchers, a subgroup drafted summary evidence-informed recommendations. Along with revisions among CPARG members, a community consultation was solicited by WLWH who were known to the authors from Ontario, Quebec and British Columbia. A legal review was also conducted to ensure understanding of the criminalization potential and concern of HIV transmission and exposure.

Results: The Canadian consensus guidelines continue to support formula feeding as the recommended method of infant feeding as it eliminates any residual risk of postnatal HIV transmission. A comprehensive approach to counselling WLWH, and families, is outlined to assist providers in effectively communicating current evidence to support fully informed in their decision making. The community review highlighted important considerations including the imperative for unbiased, woman-centred counselling, as well as supports and resources needed for implementing effective formula feeding in addition to funded formula programs. The legal review provided clarifying language around child protection services involvement and the need to provide referral to legal resources or information upon request.

Conclusion:The Canadian infant feeding consensus guideline is designed to inform and enable better care for WLWH and their babies. Ongoing evaluation of these guidelines as new evidence emerges will be important.

113 Pathways from recent incarceration to ART adherence: Opportunities for interventions to support women living with HIV post-release from correctional facilities

Margaret Erickson[1], Andrea Krüsi[1,2], Kate Shannon[1,2], Melissa Braschel[1], Candice Norris[1], Jane A. Buxton[2], Ruth Elwood Martin[2], Kathleen Deering[1,2]
[1]Centre for Gender and Sexual Health Equity, Vancouver, Canada, [2]Faculty of Medicine, University of British Columbia, Vancouver, Canada

Background: Women living with HIV are increasingly overrepresented within correctional settings and experience sub-optimal HIV health outcomes post-release from incarceration. To identify specific areas of intervention, we used path analysis to investigate pathways from recent incarceration to optimal antiretroviral therapy (ART) adherence through mediators of homelessness, criminalized substance use, and gender-based violence.

Methods: We drew on 9 years (2010-2019) of data from the SHAWNA (Sexual Health and HIV/AIDS: Women's Longitudinal Needs Assessment) Project, a longitudinal community-based research cohort with self-identified cis and trans women living with HIV in Metro Vancouver, Canada. Using path analysis, we tested direct effects between recent incarceration, mediating variables, and ART adherence, along with indirect effects between incarceration and ART adherence through each mediator. Model fit was assessed using chi-square, root mean square error of approximation (RMSEA), and comparative fit index (CFI).

Results: Among 336 participants at baseline, Indigenous women accounted for 57% of the sample, 9% were Black or otherwise racialized, and 34% were white; 7% reported trans identity. Within the last 6 months at baseline, 9% had been incarcerated, 22% had experienced homelessness, 70% had used criminalized substances, and 19% had experienced gender-based violence. Path analysis model fit indicated our hypothesized model fit well to the data ($\chi 2(1)=1.100$; $p=0.2943$; CFI=1.000; RMSEA=0.007). In the final model recent homelessness, recent criminalized substance use, and recent gender-based violence fully mediated the pathway between recent incarceration and optimal ART adherence.

Conclusions: To improve ART adherence and subsequent health outcomes among women living with HIV post-release from incarceration, there is an urgent need for expanded options for safe and supportive housing, alongside tailored supports for criminalized substance use. Services and programs must be rooted in cultural safety and trauma and violence-informed practice, and be sensitive to the ongoing impacts of gender-based violence among marginalized women.

137 Access To Care and Impacts On HIV Treatment Interruptions During The COVID-19 Pandemic Among People Living With HIV In British Columbia, Canada

David Moore[1,2], Clara Tam[1], Lu Wang[3], Kate Salters[1,3], Jason Chia[1], Jason Trigg[1], Paul Sereda[1], Nicole Dawydiuk[1], Tim Wessling[1], Sean Grieve[1], Robert Hogg[1,3], Rolando Barrios[1,2]
[1]Bc Centre For Excellence In HIV/AIDS, Vancouver, Canada, [2]University of British Columbia, Vancouver, Canada, [3]Simon Fraser University, Burnaby, Canada

Background: The COVID-19 pandemic has resulted in many changes in healthcare service delivery. We examined perspectives on health service access due to COVID-19 of people living with HIV (PLWH) in BC and potential resulting effects on antiretroviral treatment interruptions (TIs).

Methods: From January 2016 - September 2018, we used purposive sampling to enrol PLWH aged ≥19 years across BC into the STOP HIV/AIDS Program Evaluation (SHAPE) study. Participants completed surveys at enrollment, 18 and 36 months. In October 2020, additional COVID-19 questions were added to surveys. We examined trends in TIs (defined as >60 days late for ART refill using data from the BC HIV Drug Treatment Program) in six-month periods among all SHAPE participants between March 2019 and August 2021. We examined associations of TIs with reported health service access using generalized linear mixed models.

Results: Of 644 PLWH in the SHAPE study, 595 were alive in March 2019 and had been receiving ART for at least three months since SHAPE enrollment. Of these, 3.4-7.4% participants had a TI in any six-month period. A total of 196 participants completed the COVID questions of whom 33% reported having difficulty accessing healthcare during COVID-19, 10.9% reported avoiding a continuing healthcare service due to COVID-19 related concerns and 72.9% reported using virtual healthcare services since March 2020. In multivariable analysis, the odds of interrupting treatment in any six-month period were not significantly different from March – August 2019, except for March – August 2021, where they were lower (adjusted odds ratio [AOR]= 0.25; 95% CI 0.06-0.99). None of the reported challenges to health care services were associated with TIs.

Conclusion: While some participants reported challenges to accessing services or avoidance of services due to COVID-19, TIs were not more likely during COVID-19 than before. None of these challenges were associated with TIs.

177 Neonatal combination antiretroviral prophylaxis for the prevention of vertical transmission: a risk-based assessment

Jeanne Brochon[1], Terry Lee[2], Joel Singer[2], Jason Brophy[3], Marie-Elaine Metras[1], Jeanette Coumeau[4], Alena Tse-Chang[5], Deborah Money[6], Isabelle Boucoiran[1], Laura J. Sauve[6], Ari Bitnun[7], Fatima Kakkar[1]

[1]CHU Sainte Justine, Université de Montréal, Montréal, Canada, [2]CIHR Canadian HIV Clinical Trials Network, Vancouver, Canada, [3]Children's Hospital of Eastern Ontario, Ottawa, Canada, [4]IWK Health Centre, Dalhousie University, Halifax, Canada, [5]Stollery Children's Hospital, Edmonton, Canada, [6]Women's Hospital and Health Centre of British Columbia, University of British Columbia, Vancouver, Canada, [7]Hospital for Sick Children, University of Toronto, Toronto, Canada

Objectives:: Neonatal combination antiretroviral (cART) is recommended in situations at high-risk of vertical transmission, however, the maternal viral load at time of delivery (dVL) for which neonatal cART is warranted is not clear. The objective of this study was to describe cART use and risk of vertical transmission across different risk categories.

Methods:Data were analyzed from mother-infant pairs (MIPs) in the Canadian Perinatal HIV Surveillance Program between 1997-2020. Infants were categorized as high-risk (dVL ≥1000c/ml, or maternal cART <4 weeks prior to delivery), medium-risk (dVL detectable and <1000c/ml, and maternal cART ≥4 weeks prior to delivery), and low-risk (dVL undetectable, and maternal cART ≥4 weeks prior to delivery). Neonatal ART regimens and HIV transmission risk was compared between groups.

Results: Out of 2891 MIPs included in the analysis, 813 (28.1%) were considered high-risk, 196 (6.8%) medium-risk and 1882 (65.1%) low-risk. An equal proportion of high and medium-risk infants received cART (25.7% vs. 26.6%) vs. 5.8% of low-risk infants. There were 55 transmissions events; this included 49 (6.2%) of those in the high-risk, 1 (0.5%) in the medium-risk, and 5 (0.3%) in the low-risk category (p<0.001). In the high-risk group, transmissions occurred in 22.6% of children without any ART, 12.6% of those on cART, 3% on dual therapy, and 1.9% on single therapy (p<0.001); whereas in low and medium-risk groups, transmissions occurred in only 4.8% and 2.1% of children receiving cART. There were no transmissions among children receiving single, dual or no ART in both low and medium-risk groups.

Conclusion:While cART was equally prescribed in both high and medium-risk situations, the benefits in the medium-risk group are not clear. These data suggest that efforts may be better directed towards ensuring access to cART in high-risk situations, and limiting cART exposure in others.

179 Usability and Acceptability of an Artificial Intelligence-based Chatbot to Facilitate Antiretroviral Self-management in People Living with HIV

Yuanchao Ma[1,2,3,4],Kim Engler[1,2,3],Serge Vicente[1,2,5],Sofiane Achiche[4], Benoît Lemire[3,6], Adriana Rodriguez Cruz[1,2,3,7],Lévis Thériault[8], Skander Soussou[8], Benjamin Régazzoni[8], Gavin Tu[2,9], Maria Nait Ei Haj[2,10], Alexandra de Pokomandy[1,3,7], Joseph Cox[1,3,11], Navid Zahedi Niaki[3], Bertrand Lebouché[1,2,3,7]

[1]Centre for Outcomes Research and Evaluation, Research Institute of the McGill University Health Centre, Montreal, Canada, [2]Canadian Institutes of Health Research Strategy for Patient-Oriented Research Mentorship Chair in Innovative Clinical Trials in HIV, Montreal, Canada, [3]Chronic and Viral Illness Service, Division of Infectious Disease, McGill University Health Centre, Montreal, Canada, [4]Department of Mechanical Engineering, Polytechnique Montréal, Montreal, Canada, [5]Department of Mathematics and Statistics, Université de Montréal, Montreal, Canada, [6]Department of Pharmacy, McGill University Health Centre, Montreal, Canada, [7]Department of Family Medicine, McGill University, Montreal, Canada, [8]Department of Computer Engineering and Software Engineering, Polytechnique Montréal, Montreal, Canada, [9]Faculty of Medicine, Université Laval, Quebec City, Canada, [10]Faculty of Pharmacy, Université de Montréal, Montreal, Canada, [11]Department of Epidemiology and Biostatistics, McGill University, Montreal, Canada

Objectives: To engage people living with HIV (PLHIV) in their care and support their HIV self-management, we developed a bilingual (EN/FR) Chatbot MARVIN using artificial intelligence. MARVIN answers patients' questions about antiretrovirals 24/7 with expert-validated information. In this study, we gauged MARVIN's usability and acceptability.

Methods: We recruited 30 adult PLHIV receiving care at the McGill University Health Centre for a 4-week trial. Participants were asked to 1) have at least 20 conversations with MARVIN on predetermined topics and complete a usability and acceptability questionnaire and 2) participate in a semi-structured focus group in week 4 to discuss their experiences with MARVIN. Usability and acceptability were measured using the Usability Metric for User Experience-lite (UMUX-lite) and Acceptability E-Scale (AES), considering their predetermined thresholds of 68 and 24 respectively. We then compared the qualitative and the quantitative results on the four sub-constructs of the Technology Acceptance Model (TAM): perceived ease of use, perceived usefulness, attitude toward use, and behavioral intention.

Results: From April to December 2021, 26 participants completed the study. Their mean age was 40.8 years (SD=11.9), most were male (n=23/26), and over half (n=14/26) preferred to communicate with MARVIN in English. Mean scores for the UMUX-lite and AES were 69.8 and 23.7. Proximity to the predetermined thresholds indicates that MARVIN is usable and acceptable. Preliminary qualitative results suggest that MARVIN is easy to use and useful when it provides the correct answers. However, participants noted the lack of breadth and depth of conversations and requested several additional topics, including antiretroviral side effects, drug interactions, community support group information, and HIV research updates.

Conclusion: Our preliminary results suggest that the current MARVIN Chatbot is usable and acceptable for PLHIV and is a promising telehealth companion. Adding new conversational topics will be a main priority for the next phase.

184 Access to community anal cancer screening among men who have sex with men living with HIV in the HPV Screening and Vaccine Evaluation (HPV-SAVE) study

Amit Gupta[1,12], Tessa Lawson Tattersall[1,11], Aidan Ablona[1], Ramin Azmin[1], Ann N. Burchell[2,3], Joshua Edward[1], Mark Gaspar[3], Daniel Grace[3], Jennifer Gillis[4], Brody Lyons[1], Paul MacPherson[5,6,7], Benita Okocha[1], Ron Rosenes[8], Darrel H. S. Tan[9], Irving Salit[9], Troy Grennan[1,10]
[1]BC Centre For Disease Control, Vancouver, Canada, [2]Department of Family and Community Medicine and MAP Centre for Urban Health, St. Michael's Hospital, Toronto, Canada, [3]Dalla Lana School of Public Health, Epidemiology Division, University of Toronto, Toronto, Canada, [4]Women's Health Research Institute, BC Women's Hospital, Vancouver, Canada, [5]Clinical Epidemiology and Chronic Diseases Programs, The Ottawa Hospital Research Institute, Ottawa, Canada, [6]Division of Infectious Diseases, The Ottawa Hospital, Ottawa, Canada, [7]Department of Medicine and School of Epidemiology and Public Health, Faculty of Medicine, Ottawa, Canada, [8]Toronto General Hospital Research Institute, University Health Network, Toronto, Canada, [9]Division of Infectious Diseases, St. Michael's Hospital, Toronto, Canada, [10]Division of Infectious Diseases, University of British Columbia, Vancouver, Canada, [11]University College London, London, United Kingdom, [12]Faculty of Pharmaceutical Sciences, University of British Columbia, Vancouver, Canada

Background: HPV-associated anal cancer is a leading cause of non-AIDS defining mortality in men who have sex with men (MSM) living with HIV and occurs at rates up to 100-times greater than in the general population. Despite recent indications that screening reduces the incidence and severity of anal cancer, there are no widespread, publicly funded, anal cancer screening programs. We examined familiarity with screening strategies for anal cancer among MSM living with HIV.

Methods: The HPV-SAVE study is a national study examining anal cancer screening among MSM living with HIV in Canada. Between 02/2016 to 05/2021, participants completed a questionnaire at study entry including items related to prior anal cancer screening familiarity and experience, which we report using descriptive statistics.

Results: Among the 750 individuals who completed the questionnaire, the majority were white (70.7%), over 50 years old (52.4%) and unpartnered (53.8%). A minority reported previous awareness of targeted anal cancer screening that is accessible in the community (137/715; 19.2%). Experience with screening included having had a digital anal exam (493/715; 69.0%), previous anal pap for cancer screening (129/673; 19.2%), or anoscopy (96/649; 14.8%). Previous self-examination for anal lesions was reported by 322 individuals (45.2%), and 97 individuals (13.9%) reported examination by their partner. Most (89.8%) were comfortable discussing health issues related to their anus with their doctor and 92.7% perceived anal cancer screening as important. Following enrolment in HPV-SAVE, 236 individuals (33.1%) reported being more concerned about anal cancer than they used to be.

Conclusion: Despite being disproportionately impacted by anal cancer, most MSM living with HIV were unaware of anal cancer screening and few had prior experience with anoscopy or anal cytology. A high proportion of participants reported previous informal self-examination, suggesting that programs to increase patient-driven anal cancer screening would be well received.

249 Effects of integrase strand transfer inhibitors (INSTIs) on body mass index in children living with HIV

Katherine Baba[1], Terry Lee[2], Fatima Kakkar[3], Michael T. Hawkes[4], Lindy Samson[1], Laura Sauve[5], Stanley Read[6], Hugo Soudeyns[7], Ari Bitnun[6], Jason Brophy[1]
[1]Children's Hospital of Eastern Ontario, Ottawa, Canada, [2]CIHR Canadian HIV Clinical Trials Network, Vancouver, Canada, [3]Centre de recherche du CHU Sainte-Justine, Montreal, Canada, [4]University of Alberta, Edmonton, Canada, [5]Women's Hospital and Health Centre of British Columbia, Vancouver, Canada, [6]Hospital for Sick Children, Toronto, Canada, [7]Unite d'immunopathologie virale, Centre de recherche du CHU Sainte-Justine, Montreal, Canada

Background: Integrase strand transfer inhibitors (INSTIs) have been associated with excess weight gain in adults living with HIV. This study assessed the effect of INSTIs on BMI percentile of children living with perinatally acquired HIV (CLWPH).

Methods: EPIC4 prospectively enrolled and followed CLWPH from 7 Canadian centres from 2014-2018. Spline regression analysis was used to compare trends in BMI for patients with INSTI containing regimens versus age- and sex-matched INSTI naive patients. Data points were assessed at time of initiation and 1 & 2 years before and after starting INSTI containing regimens.

Results: 197 children (113 INSTI-exposed; 84 controls) were included, with median age 13 years at start of INSTI (range 0.4-18.5); 53% were female. 75% had normal BMI at baseline; 20% were overweight or obese, 5% were underweight. Dolutegravir, raltegravir and elvitegravir were prescribed for 33 (29%), 43 (38%), and 37 (33%), respectively. Viral load was detectable in 43/113 (39%) in INSTI group versus 9/84 (11%) in non-INSTI group at baseline, and in 7/61 (11.5%) and 13/73 (17.8%) after 2 years. Median CD4 count was 694 cells/uL in INSTI group vs 772 cells/uL in non-INSTI group at baseline, and 772 cells/uL vs 780 cells/uL after 2 years. Comparing BMI percentile over time in INSTI and control groups, modest increases in BMI percentile from baseline were noted in both groups. Regression analysis demonstrated no statistically significant difference in BMI percentiles between INSTI and non-INSTI groups (p=0.276), except in those taking INSTI plus protease inhibitors (n=27; difference in change in BMI percentile compared to non-INSTI at 1 and 2 years of 0.05 [p=0.014] and 0.12 [p=0.014], respectively).

Conclusion: INSTI-containing regimens do not appear to be associated with increase in BMI percentile in children living with perinatally acquired HIV in Canada.

253 Long-term Outcomes of Participants on F/TAF for Pre-Exposure Prophylaxis: Results for 144 Weeks of Follow-Up in the DISCOVER Trial

Moti Ramgopal[1], Peter Ruane[2], Peter Shalit[3], **Jason Szabo[4]**, Joss De Wet[5], Yongwu Shao[6], Ramin Ebrahimi[6], Alex Kintu[6], Christoph Carter[6], Moupali Das[6], Jared Baeten[6], Karam Mounzer[7]
[1]Midway Research Center, Fort Pierece, US, [2]Ruane Clinical Research Group, Inc., Los Angeles, US, [3]Peter Shalit MD & Associates, Seattle, US, [4]McGill University Health Center, Montreal, CA, [5]Spectrum Health Care, Vancouver, CA, [6]Gilead Sciences Inc., Foster City, US, [7]Philadelphia FIGHT Community Health Centers, Philadelphia, US

DISCOVER trial demonstrated noninferior efficacy of F/TAF to F/TDF for HIV prevention with improved bone mineral density (BMD) and renal safety biomarkers at the primary endpoint at week (W) 48 and at W96. Here we report W144 outcomes for participants randomized to F/TAF and continued F/TAF in the open-label extension (OLE) phase.
We evaluated HIV incidence in participants on F/TAF through W144 and assessed changes in hip and spine bone mineral density (BMD) and in glomerular function (eGFR) from baseline to W144. 2,080 of the 2,694 participants initially randomized to F/TAF opted into the OLE phase, and 1,933 were on study drug through W144, leading to a total of 7,885 person-years (PY) of follow-up on F/TAF. Eight participants taking F/TAF acquired HIV in the blinded phase and 3 in the OLE phase. Dried blood spot analyses on the 3 OL infections found tenofovir diphosphate levels consistent with low adherence. There were no relevant resistance mutations for the 3 new infections. Among participants taking F/TAF, HIV incidence was 0.16/100 PY (95% CI 0.06-0.33) at the primary endpoint, 0.16/100 PY (95% CI 0.07-0.31) through 96 weeks and 0.14/100 PY (95% CI 0.07-0.25) through 144 weeks. Participants taking F/TAF had increases in hip (mean percentage change +0.54%) and spine (mean percentage change +1.02%) BMD from baseline to W144. Median eGFR increased by a median of 2.6 mL/min from baseline to week 144. Participants taking F/TAF gained a median 2.3 kg (IQR -0.9-5.8) over 3 years of follow up.
HIV incidence remained low with stable BMD and renal function parameters through 144 weeks of follow-up demonstrating that/TAF is a safe and effective option for long-term use in people who would benefit from PrEP.

314 IL-32 induces a chemokine signature in CD4+ T-cells linked with persistent inflammation and cardiovascular disease in people living with HIV

Hardik Ramani[1,2], Rémi Bunet[1,2], Jenabian Mohammad-ali[3], Sylla Mohamed[1], Carl Chartrand-Lefebvre[1,4], Jean-pierre Routy[5], Rejean Thomas[6], Benoit Trottier[7], Alan Landay[8], Madeleine Daurand[9], Cécile Tremblay[1,2], Mohamed El-Far[1]

[1]Centre De Recherche Du Centre Hospitalier De L'université De Montréal (crchum), Montréal, Canada, [2]Département de Microbiologie, Infectiologie et Immunologie, Faculté de Médecine,Université de Montréal, Montréal, Canada, [3]Department of Biological Sciences, Université du Québec, Montréal (UQAM), Montréal, Canada, [4]Département de Radiologie, Radio-oncologie et Médecine Nucléaire, Faculté de Médecine, Université de Montréal, Montréal, Canada, [5]Research Institute of McGill University Health Centre, Montréal, Canada, [6]Clinique médicale l'Actuel, Montréal, Canada, [7]Centre de médecine urbaine du Quartier latin, Montréal, Canada, [8]Department of Internal Medicine, Rush University Medical Center, Chicago, United States, [9]Département de Médecine, Faculté de Médecine, Université de Montréal , Montréal, Canada

Introduction: Chronic inflammation in HIV infection promotes a higher risk of co-morbidities such as cardiovascular disease (CVD), which is a leading cause of mortality in people living with HIV (PLWH). IL-32 is a potent multi-isoform proinflammatory cytokine that we and others have shown to be upregulated in T-cells from blood and coronary arteries in PLWH. In this study, we aimed to investigate the impact of IL-32 isoforms on CD4 T-cells as related to their activation and potential to recruit other immune cells to the site of inflammation.

Methods: IL-32 isoforms (α, β, γ, 500ng/ml) were used to stimulate CD4 T-cells isolated by negative selection (StemCell) from peripheral blood mononuclear cells (PBMCs) from non-infected donors (n=5). RNA was extracted at 12 hours post-activation and subjected to RNA Sequencing (NovaSeq6000). Plasma and PBMC samples were collected from PLWH and non-infected controls participating in the Canadian HIV and Aging Cohort Study (CHACS). Differentially expressed chemokines were validated at the transcriptional and protein levels by RT-qPCR (n=10) and ELISA (n=10), respectively.

Results: Systemic analysis of RNAseq showed that individual IL-32 isoforms had a distinct impact on CD4+ T-cell gene transcription with IL-32β and IL-32γ, but not IL-32α, stimulating the expression of multiple chemokines. Validation at the transcriptional and protein levels in IL-32 stimulated CD4 T-cells in vitro showed that IL-32β and IL-32γ significantly upregulated a signature of CCL22, CXCL1 and CXCL8. These chemokines were also significantly upregulated in plasma from PLWH (n=79) compared to non-infected controls (n=49) (p=0.04, p=0.001, and p=0.023, respectively).

Conclusion: Upregulation of CCL22, CXCL1 and CXCL8 by IL-32 in activated T-cells, if happening in plaque-forming sites in arteries, is likely to promote the recruitment of inflammatory neutrophil, T-cells and monocytes, which could exacerbate local inflammation and CVD. IL-32 may represent a therapeutic target to dampen inflammation and prevent CVD in PLWH.

316 Incidence and type of adverse reactions following brand-to-generic antiretroviral product substitution in British Columbia, Canada

Katherine J. Lepik[1,2], Olivia L. Hunt[1], Nicanor Bacani[1], Lu Wang[1], Junine Toy[1,2], Paul Sereda[1], Taylor McLinden[1], Linda Akagi[1,2], Marianne Harris[1,3], Erin Ready[2], Jason Trigg[1], Julio S. G. Montaner[1,3], Rolando Barrios[1,3]
[1]BC Centre For Excellence In HIV/AIDS, Vancouver, Canada, [2]St Paul's Hospital, Pharmacy Department, Vancouver, Canada, [3]University of British Columbia, Faculty of Medicine, Vancouver, Canada

Introduction: In British Columbia, antiretrovirals are provided free-of-charge through a publicly-funded HIV Drug Treatment Program (DTP). When available, generic equivalents are substituted for brand-name products, per Health Ministry policies. We describe the incidence and type of adverse reactions attributed to generic antiretrovirals (product substitution issues, “PSIs”), reported to DTP Pharmacovigilance.

Methods: We included persons living with HIV (PLWH) age ≥19 years who received generic antiretroviral(s) between 01-Jun-2017 and 30-Jun-2021, during the first year following brand-to-generic transition: abacavir-lamivudine (ABC-3TC), emtricitabine-tenofovir disoproxil fumarate (FTC-TDF), efavirenz-FTC-TDF (EFV-FTC-TDF), atazanavir and darunavir. Antiretroviral dispensing and PSI data were extracted from DTP databases. PSI incidence rate (95% confidence interval [95%CI], Poisson regression), symptoms, and post-PSI management were described.

Results: During the study period, 4904 PLWH received ≥1 first-year generic product. Median age was 52 (Q1-Q3=44-59) years and 83% were male.
The Table summarizes generic usage, PSI details and management. Most PLWH (≥93%) had previously used the brand-name equivalent. Prior generic antiretroviral experience increased over time (7% at ABC-3TC rollout 2017, 72% at darunavir rollout 2020). Fifty first-year PSIs were reported. PSI rates were low (≤1.45/100 person-years) for most generics. EFV-FTC-TDF had a higher PSI rate (3.09/100 person-years, CI95%=1.83-5.23) due to neuropsychiatric side-effects, while generic darunavir had no reported PSIs.
PSI-related symptoms included mild-moderate gastrointestinal (26/50, 52%), neuropsychiatric (26%), dermatologic (12%) effects, and general fatigue/malaise (14%). Two-thirds of PLWH with generic PSIs switched to the brand-name equivalent.

Conclusion: We report low rates (generally ≤1.45/100 person-years) of generic product substitution-related adverse events in the year following brand-to-generic transition.

Supporting Document

Table: Generic antiretroviral usage and product substitution issues during the first year following brand-to-generic transition in British Columbia, June 2017 to June 2021.

	Abacavir-Lamivudine	Emtricitabine-Tenofovir DF	Efavirenz-Emtricitabine-Tenofovir DF	Atazanavir	Darunavir
First year post-generic rollout	Jun'17-May'18	Mar'18-Feb'19	Apr'18-Mar'19	Mar'18-Feb'19	Jul'20-Jun'21
Generic antiretroviral product use in the first year following generic rollout					
N, generic-treated*	**1596**	**2167**	**635**	**1293**	**757**
Person-years exposure	1111	1172	453	927	527
Prior use of brand product; n (% of N treated)	1480 (93)	2018 (93)	607 (96)	1265 (98)	728 (96)
Prior use of generic ARVs n (% of N generic-treated)	109 (7)	220 (10)	12 (2)	495 (38)	548 (72)
Generic product substitution issues (PSIs) reported in the first year following generic rollout					
N, generic-related PSIs	**12**	**17**	**14**	**7**	**0**
Median (Q1-Q3) days to PSI	74 (32-206)	65 (39-115)	93 (53-159)	91 (85-190)	0
1st-year PSI rate per 100 person-years (95%CI)	1.08 (0.61-1.90)	1.45 (0.90-2.34)	3.09 (1.83-5.23)	0.75 (0.36-1.58)	0
PSI Symptoms (n, % of N PSIs)					
Gastrointestinal	8 (67)	7 (41)	7 (50)	4 (57)	0
CNS	4 (33)	1 (6)	7 (50)	1 (14)	0
Dermatologic	1 (8)	3 (18)	1 (7)	1 (14)	0
General fatigue/malaise	2 (17)	2 (12)	2 (14)	1 (14)	0
Other/ Unspecified	1 (8)	6 (35)	2 (14)	1 (14)	0
Post-PSI management (n, % of N PSIs)					
Switched back to brand	12 (100)	9 (53)	9 (64)	3 (43)	0
Switched to alternate generic	0	3 (18)	0	0	0
Changed ARV regimen	0	0	3 (21)	2 (29)	0
Continued generic-1	0	2 (12)	1 (7)	0	0
Temporarily stopped ARVs	0	3 (18)	1 (7)	2 (29)	0

Definitions: **N Generic-treated**, number of Drug Treatment Program (DTP) participants who received ≥1 day supply of each generic antiretroviral product during the first year (365 days) following generic rollout date (initial brand-to-generic transition using the DTP formulary generic product).
***Individuals could contribute data for more than one generic product, therefore the sum of N generic-treated for each product exceeds the total study N of 4904 persons.
PSI: Product substitution issue, an adverse reaction specifically attributed to a generic version of an antiretroviral product; **CNS**, central nervous system. **Tenofovir DF**, tenofovir disoproxil fumarate.

317 Lower AMH Levels are Associated with HIV Status in Reproductive Aged Women and Shorter LTL in Women of Late Reproductive Age

Clara Van Ommen[1], Anthony Hsieh[2], Arianne Albert[3], Elana Kimmel[2], Helene Cote[2,3], Evelyn Maan[3,4], Jerilynn Prior[3,5,6,7], Neora Pick[3,4,8], Melanie Murray[3,4,8],) for the CIHR Team on Cellular Aging and HIV Comorbidities in Women and Children (CARMA) (CIHR HIV CTN 277
[1]Department of Medicine, University Of British Columbia, Vancouver, Canada, [2]Department of Pathology and Laboratory Medicine, University of British Columbia, Vancouver, Canada, [3]Women's Health Research Institute, British Columbia Women's Hospital, Vancouver, Canada, [4]Oak Tree Clinic, British Columbia Women's Hospital, Vancouver, Canada, [5]Centre for Menstrual Cycle and Ovulation Research, University of British Columbia, Vancouver, Canada, [6]Division of Endocrinology, Department of Medicine, University of British Columbia, Vancouver, Canada, [7]School of Population and Public Health, University of British Columbia, Vancouver, Canada, [8]Division of Infectious Disease, Department of Medicine, University of British Columbia, Vancouver, Canada

Background: HIV is associated with diminished fertility, younger age at menopause, and shorter leukocyte telomere length (LTL), a marker of cellular aging. Anti-Mullerian hormone (AMH) is a reliable marker of ovarian reserve. We sought to examine the associations among LTL, AMH, and HIV, to better understand factors associated with ovarian aging in women living with HIV (WLWH), cross sectionally and longitudinally.

Methods: We included 256 WLWH and 206 HIV-negative women 12-50 years of age enrolled in the CARMA cohort with ≥1 study visit(s), >1 year apart. Relative LTL and serum AMH were measured by qPCR and ELISA. Women were separated for analyses in reproductive (<35 years of age) vs. late reproductive (≥35 years of age) life phases. Using multivariable mixed-effects linear regressions or logistic regressions, we assessed factors associated with AMH and ΔAMH/year, while adjusting for relevant confounders including age, ethnicity, and substance use.

Results: WLWH and HIV-negative controls were of similar age (33.5±SD vs. 32.3±SD years, p=0.62) but WLWH had shorter LTL (7.2 vs. 7.5 p=0.0002) and lower AMH (1.5ng/mL vs. 2.3ng/mL p=0.032). After adjusting for relevant confounders including substance use and ethnicity, HIV was associated with 20% lower AMH (p=0.05) in women <35 years and shorter LTL was associated with AMH below the clinical threshold of 2 ng/ml among women ≥35 years (p=0.046). Longitudinally, ΔAMH/year was related to age in younger women, and primarily associated with AMH levels at first visit among older women.

Conclusions: Factors associated with AMH change across the reproductive lifespan. Our data show lower AMH levels among WLWH <35 years, suggesting that HIV infection and/or treatment may have an initial detrimental effect on ovarian reserve. In women ≥35 years, the association between shorter LTL and lower AMH suggests that the immune and reproductive aging connections may be important in this age.

Epidemiology and Public Health Oral Abstracts / Épidémiologie et santé publique eposés oraux

31 Low Human Papillomavirus (HPV) Vaccine Coverage among Women Living with HIV in Ontario

Catharine Chambers[1,2], Jennifer Gillis[3], Joanne Lindsay[2], Anita Benoit[1], Claire Kendall[4], Abigail Kroch[5], Ramandip Grewal[1,2], Mona Loutfy[6], Ashley Mah[2], Kristen O'Brien[5], Gina Ogilvie[3], Janet Raboud[1], Anita Rachlis[7], Beth Rachlis[8], Anna Yeung[2], Mark Yudin[2], Ann Burchell[1,2]
[1]University of Toronto, Toronto, Canada, [2]Unity Health Toronto, Toronto, Canada, [3]University of British Columbia, Vancouver, Canada, [4]University of Ottawa, Ottawa, Canada, [5]Ontario HIV Treatment Network, Toronto, Canada, [6]Women's College Research Institute, Toronto, Canada, [7]Sunnybrook Health Sciences Centre, Toronto, Canada, [8]ICES, Toronto, Canada

Background: Women living with HIV are at higher risk for cervical and other HPV-related cancers due to biological synergies between HIV and HPV. National immunization guidelines recommend HPV vaccine for people living with HIV up to 27 years of age. We measured HPV vaccine coverage among women attending HIV care in Ontario and identified socio-demographic, behavioural, and clinical characteristics associated with HPV vaccination.

Methods: The Ontario HIV Treatment Network Cohort Study is a multi-site clinical cohort. Participants who self-identified as a cis- or trans-woman completed a one-time questionnaire on HPV vaccine knowledge and receipt during annual interviews (2017-2020). We used logistic regression to derive age-adjusted odds ratios (aOR) and 95% confidence intervals (CI) to identify factors associated with self-reported vaccine uptake (≥1 dose).

Results: Among 592 women (median age=48 years; 58.3% immigrants from countries with generalized HIV epidemics), 13.2% had received ≥1 dose. Of those vaccinated, 64.6% had received the full 3-dose series. Among unvaccinated women, just over half (56.3%) had heard of HPV vaccine (vs. 100% of vaccinated women). Vaccine coverage was significantly higher among women aged 20-29 years at 31.0% but fell to 13.9% in those aged 30-49 years and <10% in those aged ≥50 years. The median age at first dose was 40 years. After adjusting for age, vaccine uptake was significantly associated with being employed (aOR=3.44, 95%CI=1.29-9.19), higher income ($40,000-$59,999 vs. <$20,000; aOR=3.08, 95%CI=1.41-6.73), being married/common-law (aOR=1.96, 95%CI=1.09-3.52), living with children (aOR=2.39, 95%CI=1.37-4.16), immigrating to Canada >5 years ago (aOR=3.13, 95%CI=1.35-7.25), never smoking (aOR=2.10, 95%CI=1.02-4.35), and being in HIV care longer (per 10 years; aOR=1.86, 95%CI=1.27-2.71).

Conclusions: HPV vaccine knowledge and coverage remains low among women engaged in HIV care in Ontario, even among younger women most likely to benefit from vaccination. Socioeconomic factors and healthcare access facilitators were identified as key variables influencing uptake.

43 Canadian Perinatal HIV Surveillance Program: Assessment of the effect of the COVID-19 pandemic on access to HIV Treatment and vertical transmission.

Joel Singer[1], Ari Bitnun[3], Fatima Kakkar[4], Jason Brophy[5], Isabelle Boucoiran[4], Deborah Money[6], Terry Lee[2], Laura Sauve[6], Jeannette Comeau[7], Alena Tse-Chang[8], Wendy Vaudry[8], Canadian_Perinatal_HIV_Surveillance_Program[2]
[1]University Of British Columbia, Vancouver, Canada, [2]CIHR Canadian HIV Trials Network, Vancouver, Canada, [3]Hospital for Sick Children, University of Toronto, Toronto, Canada, [4]CHU Ste-Justine, Université de Montréal, Monteal, Canada, [5]Children's Hospital of Eastern Ontario, University of Ottawa, Ottawa, Canada, [6]Women's Hospital and Health Centre of British Columbia, University of British Columbia, Vancouver, Canada, [7]IWK Health Centre, Dalhousie University, Halifax, Canada, [8]Department of Pediatrics, University of Alberta, Edmonton, Canada

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

Methods: 22 Canadian pediatric and HIV centres update data yearly in January. The results reported in this abstract reflect 2020 but will be updated to include 2021 results.

Results: The number of HIV exposed infants per year has increased over time, with 250 infants born in 2020; 32% came from Ontario, 24% from Quebec, 17% from Alberta, 14% from Saskatchewan, 7% from British Columbia and 4% from Manitoba; 60% were Black, 21% were Indigenous, and 13% were white. Overall, 63% of people acquired HIV heterosexually, 13% through injection drug use and 4.4% perinatally. The proportion and number of pregnant women sub-optimally treated in May-December 2020 was 7.7% (12/155) compared to 6.6% (86/1297) in the period from 2015-2019. The corresponding transmission rates were 3.2% (5/155) versus 1.3% (17/1297), respectively. Among those who had acquired HIV through IDU, the sub-optimal treatment rate was 26.1% during COVID-19, versus 13.6% in the pre-COVID-19 period.

Conclusions: The increase in perinatal transmission rate from 1.3% (2015-2019) to 3.2% during the pandemic is a clinically important increase; it is the highest reported rate in over 5 years. Women acquiring HIV through IDU may have been at highest risk of vertical transmission because of sub-optimal treatment. These data serve as a disturbing signal of problems in accessing care for addictions, prenatal care and HIV-specific care in the first waves of the pandemic. Additional attention to at-risk populations is needed as the pandemic continues to affect Canada.

128 Prevalence of COVID-19 infection and vaccine uptake among participants of the Ontario HIV Treatment Network Cohort Study (OCS)

Agatha Nyambi[1], Tsegaye Bekele[1], Ann Burchell[2,3], Catharine Chambers[2,3], Mary Ndung'u[2], Colin Kovacs[4], Abigail Kroch[1,2,5]
[1]Ontario HIV Treatment Network, Toronto, Canada, [2]University of Toronto, Toronto, Canada, [3]Unity Health Toronto, Toronto, Canada, [4]Maple Leaf Medical Clinic, Toronto, Canada, [5]Public Health Ontario, Toronto, Canada

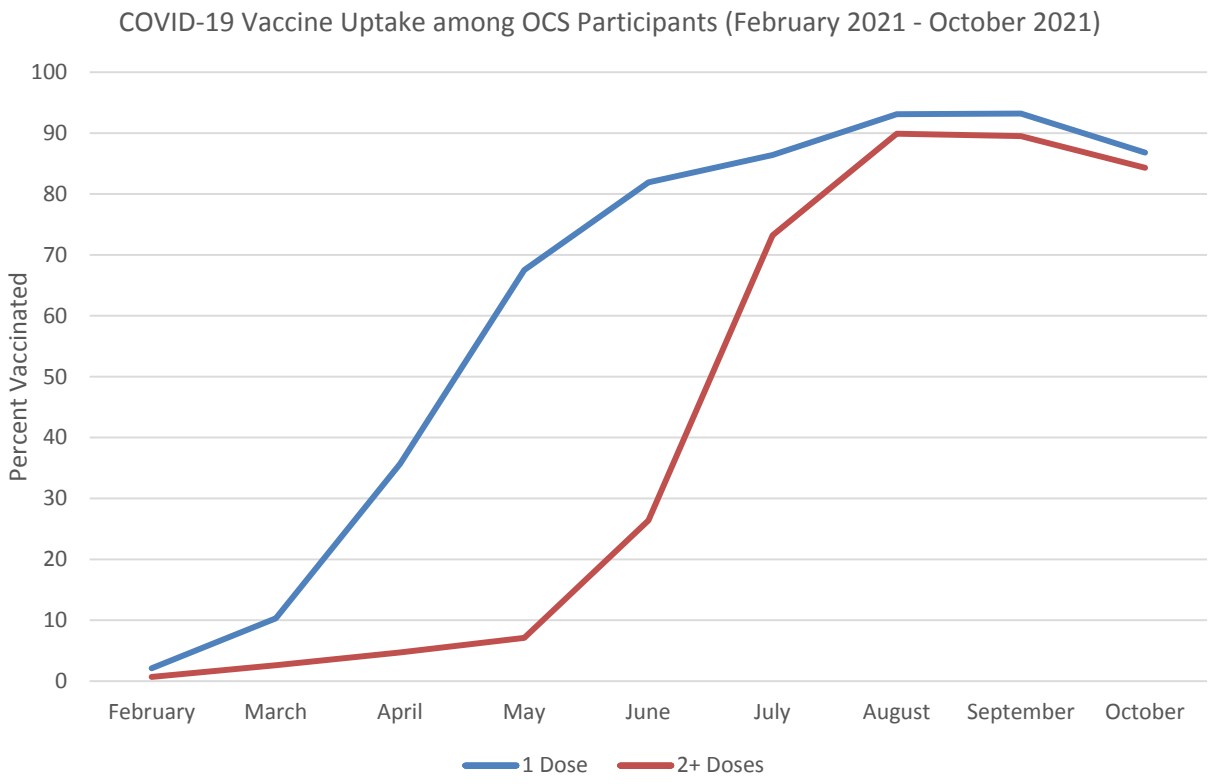
Background: People living with HIV may experience a higher risk of severe COVID-19 outcomes because of their immune status. Our aim was to describe SARS-CoV-2 infection and COVID-19 vaccine uptake among people living with HIV.
Methods: We analysed data from the OCS, a cohort of people receiving HIV care at 15 clinics across Ontario. OCS data are collected from clinical chart abstraction, linkage with the Public Health Ontario Laboratory database, and annual interviewer-administered questionnaires. Since May 2020, a module was added to the questionnaire to assess the impacts of the COVID-19 pandemic. Questionnaires administered between May 2020 and October 2021 were included in the current analyses, with the most recent questionnaire for participants who completed two or more questionnaires.

Results:
3,186 participants completed the COVID-19 module of whom 36% (1,157; median age: 49; 869 men; 189 women) reported testing for SARS-CoV-2. Among those tested, 94 (8%) reported testing positive for SARS-CoV-2. Test positivity was higher among women/transwomen compared to men (16% vs. 6%) and Black and Latin American participants compared to White participants (16.1% Black, 17.9% Latin American, 4.2% White). Among 1,876 participants (median age: 55) interviewed in 2021, an increasing proportion reported having received 1+ doses of the COVID-19 vaccine, from 0.7% in February 2021 to 84.3% in October 2021 (Figure 1).

Conclusions:
Similar to the general population of Ontario, racial minorities living with HIV shoulder a disproportionate burden of COVID-19 infection. Our results also indicate a higher vaccine uptake compared to the general population of Ontario.

Supporting Document

Figure 1: COVID-19 Vaccine Uptake among OCS Participants by Month of Interview in 2021



133 Impact of COVID-19 pandemic on HIV testing and first-time HIV diagnoses in Ontario in 2020

Sean Colyer[1], Juan Liu[2], Joseph Cox[3,4], Ken English[5], Kingston Wong[6], Nashira Popovic[3], Vanessa Tran[2,7], Ashleigh Sullivan[2], Nahomi Amberber[3], Abigail E Kroch[1,2,8]
[1]Ontario HIV Treatment Network, Toronto, Canada, [2]Public Health Ontario, Toronto, Canada, [3]Public Health Agency of Canada, Ottawa, Canada, [4]Faculty of Medicine and Health Sciences, McGill University, Montreal, Canada, [5]AIDS and Hepatitis C Programs, Ontario Ministry of Health, Toronto, Canada, [6]Department of Psychology, Brock University, St. Catharines, Canda, [7]Department of Laboratory Medicine and Pathobiology, University of Toronto, Toronto, Canada, [8]Dalla Lana School of Public Health, University of Toronto, Toronto, Canada

Background: COVID-19 pandemic public health restrictions, imposed March 2020 in Ontario, impacted accessibility to HIV testing. We describe HIV testing and first-time HIV diagnoses in Ontario in 2020 relative to 2019.

Methods: Ontario's HIV surveillance is laboratory-based. Demographic information is collected on requisition forms and follow-up with clinicians for positive test results. Diagnoses reported are those learning their status for the first-time, as assessed by linkage with prior positive diagnostic or viral load, or no report of prior positive test.

Results: HIV tests decreased by 28.5% among males in 2020 from 2019 and by 23.3% among females. The HIV test positivity rate increased among males from 0.154% to 0.169%, and decreased among females from 0.051% to 0.042%. The number of males diagnosed decreased by 21.4% from 514 in 2019 to 404 in 2020; the number of females decreased by 37.1% from 167 to 105. The proportions diagnoses attributed to each of Ontario's five mutually inclusive priority populations were consistent with 5-year (2015-2019) trends: 61.8% gay, bisexual, and other men who have sex with men; 24.6% African, Caribbean, and Black people; 11.0% people who use injection drugs; 5.2% Indigenous Peoples; and 20.6% were Women.

Conclusions: HIV diagnoses decreased in Ontario in 2020, likely as a function: (1) missed HIV diagnoses due to reduced access to HIV testing; (2) a true decrease in HIV transmission facilitated by COVID-19 restrictions and HIV PrEP uptake; and (3) decreased numbers of misclassified diagnoses. Each year, some cases with a previous HIV diagnosis are misclassified as a first-time HIV diagnoses due to unreported test history information. COVID-19 restrictions affected the number of people previously diagnosed with HIV migrating to Ontario, and their contribution of misattributed diagnoses. The unchanged distribution of diagnoses across priority populations suggests there was no/little disproportionate impact from COVID-19 on access to testing.

144 Access to healthcare and the burden of sexually transmitted infections among heterosexual African, Caribbean, and Black men in Toronto, Canada

Irenius Konkor[1], Roger Antabe[2], Paul Mkandawire[3], Winston Husbands[4], Josephine Wong[5], Isaac Luginaah[6]
[1]University of Toronto Mississauga, Missisauge, Canada, [2]University of Toronto Scarborough , Scarborough , Canada, [3]Carleton University, Ottawa, Canada, [4]Dalla Lana School of Public Health, Toronto, Canada, [5]'X' University, Toronto, Canada, [6]Western University, London, Canada

Sexual health reports continue to show increasing trends of sexually transmitted infections (STIs) in Canada. Even though the evidence on racial STIs disparities is limited, the few non-representational studies suggest some racial groups are disproportionately impacted. Effective use of appropriate health services could enhance timely diagnosis and subsequent treatment especially among racialized populations who often have limited access to resources. That notwithstanding, there is a dearth of research on how racialized groups access and use STI health services in Canada. We contribute to this gap by examining heterosexual African, Caribbean, and Black (ACB) men's STI status and their access to health services in Toronto, Canada. We used complementary log-log regression to analyze survey data (n=240) that was collected between March 2018 and February 2019 from heterosexual ACB men in Toronto. The findings show that 18.3% of heterosexual ACB men have a history of one or more STIs diagnoses either in the past six months or over six months ago. The most common STIs were HIV (6.6%) and Chlamydia (7.7%). Multivariate results revealed that ACB men with a history of STI diagnosis (OR=1.99, CI=1.14, 3.49) encountered challenges accessing healthcare in the 12 months prior the survey. Other factors such as having no family doctor (OR=1.88, CI=1.20, 2.95), being immigrant (OR=1.93, CI=1.19, 3.15), having language difficulty (OR=1.85, CI=1.01, 3.41), and experiencing housing instability (OR=1.56, CI=1.05,2.32) were associated with higher odds of experiencing difficulty accessing healthcare. These findings are discussed within the broader concept of marginalization and the burden of STIs among heterosexual ACB men. We also recommend the need to pay attention to structural factors and social determinants of health that increase ACB and other marginalized populations' susceptibility to STIs as well as inhibit their access to STI health services.

149 Challenges to Communicating the Undetectable=Untransmittable (U=U) HIV prevention message: Healthcare Provider Perspectives

Daniel Grace[1], Mackenzie Stewart[1], Ezra Blaque[1], Heeho Ryu[1], Praney Anand[1], Cathy Worthington[2], Mark Gilbert[3]
[1]University of Toronto, Dalla Lana School of Public Health, Toronto, Canada, [2]University of Victoria, School of Public Health and Social Policy, Victoria, [3]British Columbia Centre for Disease Control, Clinical Prevention Services, Vancouver

“Undetectable=Untransmittable”, or U=U, is a powerful public health message designed to reduce HIV stigma and help communicate the scientific consensus that HIV cannot be sexually transmitted when a person living with HIV has an undetectable viral load. Between October 2020-February 2021 we conducted 11 in-depth interviews and 3 focus groups with diverse HIV/STI service providers (nurses, public health workers, physicians, sexual health educators) in Ontario, Canada (n=18). Our objective was to understand how the U=U message was communicated to sexual health service users. Interview questions were embedded in a larger study focused on improving access to HIV/STI testing. Transcripts were transcribed verbatim and analysed following grounded theory. Most providers emphasized the significance of this biomedical advancement in HIV prevention but had some challenges effectively communicating U=U in everyday practice. We discovered four interrelated barriers related to consistently communicating the U=U message: (1) provider-perceived limitations of the framing (e.g., a few participants wanted to “leave a margin” of risk and were not comfortable with “zero HIV risk” messages); (2) service users not interested in receiving sexual health information (e.g., in order to provide “client centered care” some providers did not share U=U messages if service users were only interested in HIV/STI testing or if other discussions needed prioritization); (3) skepticism and HIV stigma from service users (e.g., providers explained how the hesitancy of some service users accepting the U=U message was shaped by a legacy of HIV prevention messages and persistent HIV stigma); and (4) need for more culturally competent resources (e.g., U=U resources needed for communities other than sexual and gender minority men; non-English speakers). We discuss ways to overcome barriers to communicating the U=U message as well as the limitations and potential unintended consequences of U=U framings in the context of persistent unequal access to HIV prevention and treatment.

163 Factors Associated with Mortality in a Cohort of People Living with HIV in British Columbia, Canada

Clara Tam[1], Kate Salters[1,2], David Moore[1,3], Wendy Zhang[1], Jason Trigg[1], Tim Wesseling[1], Sean Grieve[1], Surita Parashar[1], Taylor McLinden[1], Paul Sereda[1], Matthew Moher[4], Patrick McDougall[5], Robert Hogg[1,2], Rolando Barrios[1,3]
[1]British Columbia Centre For Excellence In HIV/AIDS, Vancouver, Canada, [2]Faculty of Health Sciences, Simon Fraser University, Burnaby, Canada, [3]Faculty of Medicine, University of British Columbia, Vancouver, Canada, [4]Cool Aid Community Health Centre, Victoria, Canada, [5]Dr. Peter Centre, Vancouver, Canada

Background: Despite access to effective antiretroviral therapy (ART), people living with HIV (PLWH) continue to experience an elevated risk of premature mortality. We sought to characterize sociodemographic factors associated with mortality among PLWH.

Methods: Between January 2016-September 2018, we used purposive sampling to enrol PLWH aged ≥19 in British Columbia (BC) into the STOP HIV/AIDS Program Evaluation (SHAPE) study. Participants completed a baseline survey which included questions on socio-demographic characteristics, quality-of-life, co-morbidities, and social support (MOS-SSS scale), and were followed until September 2021. Deaths and causes of death were identified through Vital Statistics linkages with the BC HIV Drug Treatment Program. We conducted bivariate analyses (Chi-squared/Wilcoxon rank sum tests) examining all-cause mortality in SHAPE and conducted a survival analysis employing a multivariable Cox proportional hazards model.

Results: As of September 2021, 71(11.0%) of 644 participants had died. The majority were aged 40-59 (n=48,67.6%) and male (n=57,80.3%). The most common specified cause of death was overdose (n=12,16.9% of deaths), followed by non-AIDS related cancers (n=10,14.1%). A higher proportion of individuals who died had a history of incarceration (52.1% vs. 33.3%;p=0.002), recent homelessness (28.2% vs. 12.6%;p<0.001), and recent injection drug use (32.4% vs. 19.0%;p=0.009), compared to those alive at the end of follow-up. In the survival analysis, older age (adjusted hazard ratio [aHR]:1.37 per 10 year increase, 95%CI:1.07-1.77) and history of Hepatitis C co-infection (aHR:2.60, 95%CI:1.61-4.19) were associated with increased hazard of death, while higher quality of life (aHR:0.77 per 0.1 unit increase, 95%CI:0.64-0.94) and higher social support (aHR:0.89 per 10 unit increase, 95%CI:0.82-0.98) were protective.

Conclusion: Those with higher quality of life and higher social support had a lower risk of death whereas older individuals and those with Hepatitis C ever had an increased risk. Our findings highlight how socio-structural inequities continue to impact the longevity of PLWH despite universal ART.

204 Perceptions of and changes in amphetamine use among gay, bisexual, and other men who have sex with men (GBM) in three Canadian cities

Anthony W.-H. Yuen[1], Jordan M. Sang[2], Lu Wang[2], Justin Barath[2], Nathan J. Lachowsky[3,4], Allan Lal[2], Julius Elefante[1], Trevor A. Hart[5,6], Shayna Skakoon-Sparling[5], Syed W. Noor[5,6], Herak Apelian[8,9], Abbie Parlette[6], Joseph Cox[8,9], Gilles Lambert[9,10], Daniel Grace[7], Jody Jollimore[4], Kiffer G. Card[2,3,4,11], Mark W. Hull[2], David M. Moore[1,2]

[1]University Of British Columbia, Vancouver, Canada, [2]BC Centre for Excellence in HIV/AIDS, Vancouver, Canada, [3]University of Victoria, Victoria, Canada, [4]Community-Based Research Centre, Vancouver, Canada, [5]Louisiana State University Shreveport, Shreveport, USA, [6]Ryerson University, Toronto, Canada, [7]University of Toronto, Toronto, Canada, [8]McGill University, Montreal, Canada, [9]Research Institute of the McGill University Health Centre, Montreal, Canada, [10]Institut national de santé publique du Québec, Montreal, Canada, [11]Simon Fraser University, Burnaby, Canada

Background: GBM who use amphetamines experience increased likelihood of HIV transmission and poor adherence to antiretroviral therapy. We explored attitudes of GBM toward their amphetamine use and associations with reduced amphetamine use over time.

Methods: We recruited sexually-active GBM aged ≥16 years in Montreal, Toronto, and Vancouver using respondent-driven sampling (RDS) from from 02-2017 to 08-2019, with follow-up visits every 6–12 months. Among participants who reported past-six-month (P6M) amphetamine use at baseline, we used RDS-weighted logistic regression to identify associations with reporting needing help reducing their substance use. Comparing follow-up visits with the prior visit, we used mixed-effects logistic regression to model associations of reduced P6M amphetamine use.

Results: Of 2449 GBM enrolled, 423 self-reported as living with HIV (RDS-adjusted proportions: Montreal 12.7%, Toronto 18.4%, Vancouver 19.4%). At baseline, 727 (29.7%) reported P6M amphetamine use. Of these, 608 (83.6%) reported not needing help reducing their substance use. Reporting needing help reducing substance use was associated with group sex participation (adjusted odds ratio [AOR]=2.35, 95%CI: 1.25–4.44), HADS anxiety subscale scores ≥11 (AOR=2.11, 95%CI: 1.16–3.83), greater financial strain (AOR=1.35, 95%CI: 1.21–1.50), and greater Escape Motive Scale scores (AOR=1.07, 95%CI: 1.03–1.10). Self-reported HIV-positive status was associated with reporting needing help reducing substance use in univariable analyses (OR=2.90, 95%CI: 1.87–4.47), but was not selected for inclusion in the final multivariable model. Among 4441 follow-up visits, 534 (12.0%) were visits where participants reported decreased amphetamine use. Reduced P6M amphetamine-use was less likely among GBM who identified as African, Caribbean, or Black (AOR=0.40, 95%CI: 0.17–0.95), reported P6M ecstasy use (AOR=0.06, 95%CI: 0.04–0.09), or perceived their amphetamine use as problematic (AOR=0.12, 95%CI: 0.06–0.22).

Conclusions: Targeted interventions should focus on reaching the concentrated minority of GBM who need help reducing their substance use and view their amphetamine use as problematic but do not experience reduced use over time.

205 SARS-CoV-2 Antibody Seroprevalence Among Gay, Bisexual, and Other Men Who Have Sex with Men (GBM) in Montreal, Toronto, and Vancouver

Milada Dvorakova[1], Herak Apelian[1], Gilles Lambert[1,2], Daniel Grace[3], Alain Fourmigue[1], Marc-André Langlois[4], Corey Arnold[4], Kiran Nakka[4], David Moore[5], Trevor Hart[3,6], Nathan Lachowsky[7], Jody Jollimore[8], Shayna Skakoon-Sparling[6], Abbie Parlette[6], Allan Lal[5], Cedric Yansouni[9], Matthew Cheng[10], Jesse Papenburg[9], Joseph Cox[1,11]
[1]Research Institute of the Mcgill University Health Centre, Montréal, Canada, [2]Institut National de Santé Publique du Québec, Montréal, Canada, [3]University of Toronto, Toronto, Canada, [4]University of Ottawa, Ottawa, Canada, [5]BC Centre for Excellence in HIV/AIDS, Vancouver, Canada, [6]X University (formerly Ryerson), Toronto, Canada, [7]University of Victoria, Victoria, Canada, [8]Community-Based Research Centre, Vancouver, Canada, [9]McGill University Health Centre, Montreal, Canada, [10]McGill University, Montreal, Canada, [11]Department of Epidemiology and Biostatistics, School of Population and Global Health, Faculty of Medicine and Health Sciences, McGill University, Montréal, Canada

Background: GBM uniquely face concurrent pandemics, HIV and COVID-19, and it is unknown to what extent they are impacted by SARS-CoV-2 infection. We provide a descriptive profile and estimates of COVID-19 infection among GBM living in Montreal, Toronto, and Vancouver.

Methods: From 16-Sep-2020 to 19-May-2021, we conducted a cross-sectional SARS-CoV-2 seroprevalence study in an ongoing closed cohort study (Engage). SARS-CoV-2 antibody seropositivity due to infection was detected using a bespoke enzyme-linked immunoassay and was coupled with a self-administered questionnaire. City-specific crude and RDS-II adjusted SARS-CoV-2 seroprevalence estimates as well as unadjusted descriptive analyses of three-city-combined data are reported.

Results: Data from 1,063 participants were included in analyses. RDS-adjusted seroprevalence in Montreal, Toronto, and Vancouver was 4.9(95%CI: 1.9-8.0), 3.1(0.5-5.7), and 4.7(0-12.2), respectively. COVID-19 seroprevalence among those living with HIV was 7.9%. Additionally, COVID-19 seroprevalence was higher in participants who belonged to the age group 30-44, had annual income of <30K or >60K, or reported potential COVID-19 exposure such as employment as an essential worker or using online social networking/dating apps to hook up with men on a weekly/daily basis (Table 1).

Conclusion: As of the end of May 2021, COVID-19 infection estimates among GBM in Montreal, Toronto and Vancouver were low and roughly comparable across the three cities. Occurrence of COVID-19 among Canadian GBM appears to vary not only by known potential COVID-19 exposures, but also by HIV status. This may have important health implications for GBM living with HIV. Further work is needed to explore the extent of these differences.

Supporting Document

Table 1:
Descriptive profile of SARS-CoV-2 antibody seroprevalence due to infection among Engage GBM (N=1,063)[1,2,3]

Seropositive for SARS-CoV-2 antibodies due to infection from 16-Sep-2020 to 19-May-2021		
	No (n = 1,010)	Yes (n = 53)
	crude n (%)	crude n (%)
Montreal	693 (94.5%)	40 (5.5%)
Toronto	181 (95.8%)	8 (4.2%)
Vancouver	136 (96.5%)	5 (3.5%)
1. Demographic characteristics		
1.1 Age		
29 or less	189 (95.0%)	10 (5.0%)
30-44	476 (94.4%)	28 (5.6%)
45 and older	335 (95.7%)	15 (4.3%)
1.2 Ethnocultural group		
French Canadian	399 (96.4%)	15 (3.6%)
English Canadian	182 (94.8%)	10 (5.2%)
Latin American	77 (92.8%)	6 (7.2%)
European	156 (93.4%)	11 (6.6%)
Arab or North African	29 (93.5%)	2 (6.5%)
Asian	66 (97.1%)	2 (2.9%)
African, Black, Caribbean	23 (92.0%)	2 (8.0%)
Indigenous	9 (90.0%)	1 (10.0%)
Other	59 (93.7%)	4 (6.3%)
1.3 Sexual orientation		
Gay	825 (94.7%)	46 (5.3%)
Bisexual	64 (95.5%)	3 (4.5%)
Other	111 (96.5%)	4 (3.5%)
2. Socioeconomic factors and determinants of health		
2.1 Education level		
Less than post-secondary	230 (95%)	12 (5.0%)
Post-secondary	770 (94.9%)	41 (5.1%)
2.2 Annual income		

Less than 30K	382 (94.3%)	23 (5.7%)
30K to 59K	371 (96.4%)	14 (3.6%)
60K or more	247 (93.9%)	16 (6.1%)
2.3 HIV status		
HIV negative	822 (95.6%)	38 (4.4%)
HIV positive	176 (92.1%)	15 (7.9%)
3. Potential COVID-19 exposure		
3.1 Travel outside of Canada since January 2020		
No	777 (95.3%)	38 (4.7%)
Yes	202 (93.5%)	14 (6.5%)
3.2 Employment as an essential worker, serving the public or patients directly		
Not an essential worker	822 (95.4%)	40 (4.6%)
Essential worker	143 (92.3%)	12 (7.7%)
3.3 Frequency of close contact with members of the public in occupation		
None of the time	438 (95.4%)	21 (4.6%)
Rarely/sometimes/almost all the time	378 (95.2%)	19 (4.8%)
All the time	131 (93.6%)	9 (6.4%)
3.4 Close contact with a COVID-19 case		
No (confirmed or not tested)	596 (97.4%)	16 (2.6%)
Unsure	184 (94.8%)	10 (5.2%)
Yes (confirmed or suspected)	191 (88.0%)	26 (12.0%)
3.5 Number of male sexual partners in the past 6 months		
0 male sexual partners	143 (94.7%)	8 (5.3%)
1-2 male sexual partners	441 (95.7%)	20 (4.3%)
3-5 male sexual partners	190 (94.5%)	11 (5.5%)
6 or more male sexual partners	226 (94.2%)	14 (5.8%)
3.6 Frequency of use of online social networking/ dating apps to hook up with other men between March 2020 until the end of May 2020		
Monthly or less	715 (95.5%)	34 (4.5%)
Weekly	142 (94.0%)	9 (6.0%)
Daily	143 (93.5%)	10 (6.5%)

Table notes

1. Among all participants who provided a serum sample, including those whose serum gave signal indicating vaccine-induced exposure to SARS-CoV-2, or those who self-reported being vaccinated (N=54). At the time of data collection, 16-Sep-2020 to 19-May-2021, vaccine rollout in Canada was in its early stages, and we did not have any participants reporting having received two doses of vaccine against COVID-19. Therefore, all participants were considered at risk of COVID-19 infection.
1. The proportion of missing observations (participant characteristic data) ranged from 0.9-6.3%.
2. The following variables were considered but not retained in the table due to lack of observable differences in seropositivity: Identifying as a person of colour (POC), gender identity, perceived general health in the past 6 months (P6M), and physical distancing in the work environment.

208 In Support of Multidimensional Frailty: A Structural Equation Model from the Canadian Positive Brain Health Now Cohort

Mehmet Inceer[1], Jan Boehnke, Marie-Josee Brouillette, Lesley Fellows, Jose Morais, Nancy Mayo
[1]*Mcgill University, Montreal, Canada*

Introduction: A large group of people is aging with HIV and face age-related conditions such as frailty. Frailty is a multifactorial syndrome with causes originating from morbidities, genetics, lifestyle, and environment. Consequently, frailty manifests on physiological, physical, emotional, cognitive, and social dimensions of health. The interconnectedness between frailty constructs is of interest. Therefore, the objective of this study is to estimate the structure and relationships between and among physical, emotional, cognitive, and social frailty subdomains and their relationship with personal and HIV-related factors in people living with HIV.

Methods: First and second visit data from the Positive Brain Health Now Study (n=856) was used. The structural model included four non-hierarchical frailty subdomains: physical, emotional, cognitive, and social. Items covering areas that were too similar to each other's were excluded. All scales were standardized for ranging from 0 to 100 and for high scores to indicate better outcomes. Data from the second visit was used to estimate the internal validity of the model.

Results: A total of 514 persons' data (female=13.4%) from the first visit with complete data were analyzed. The mean age was 52.3 (8.1). The hypothesized 4-factor model showed adequate model fit. Correlations among frailty subdomains ranged from 0.40 to 0.82. Sex, nadir CD4-count, and diagnosis before 1997 didn't predict any frailty subdomains. On the other hand, age (β range: 0.10-0.24), number of symptoms (β range: -0.37 to -0.59), and measured cognition (β range: 0.09 to 0.24) directly predicted all frailty subdomains. Current CD4 predicted only social (β=0.09) and CRP predicted only cognitive frailty (β=-0.15). The model remained the same using the second visit data.

Conclusion: This is the first time that a multidimensional model of frailty is tested in HIV. Measures used here are connected to evidence-based interventions that could improve the lives of people living with frailty.

212 The Cedar Project: Understanding the Systemic Social Determinants of Non-Fatal Drug Overdose Among Young Indigenous People Who Use Drugs in British Columbia, Canada

David Zamar[1,9], Kate Jongbloed[2,3], April Mazzuca[1], Margo Pearce[1], Sherri Pooyak[4,5], Lou Demerais[5], Wayne Christian[5,6], Mary Teegee[7,8], Martin Schechter[1], Patricia Spittal[1,9], For The Cedar Project Partnership

[1]Faculty of Medicine, School of Population and Public Health, University of British Columbia, Vancouver, Canada, [2]School of Public Health & Social Policy, Faculty of Human & Social Development, University of Victoria, Victoria, Canada, [3]BC Office of the Provincial Health Officer, , Canada, [4]Aboriginal HIV/AIDS Community-Based Research Collaborative Centre, Victoria, Canada, [5]The Cedar Project Partnership, , Canada, [6]Splatsin te Secwepemc First Nation, , Canada, [7]Gitk'san and Carrier, Takla Lake First Nation, , Canada, [8]Carrier Sekani Family Services, Prince George, Canada, [9]BC Children's Hospital Research Institute, Vancouver, Canada

Previous Cedar Project research identified recently experiencing a non-fatal drug overdose was associated with increased risk of all-cause mortality. In the ongoing toxic drug crisis, closer examination of predictors of non-fatal overdose are important to address the disproportionate burden of overdose death among Indigenous peoples in BC.

This longitudinal study (2011-2016) comes from the Indigenous-governed Cedar Project cohort and examines factors associated with non-fatal overdose among young Indigenous peoples who use drugs in Vancouver and Prince George, BC. The primary outcome was a self-reported non-fatal overdose measured at semi-annual follow-ups. Prentice-Williams-Peterson models were used to examine factors associated with non-fatal overdose in men and women, separately. Results were adjusted for location, age, and calendar year.

Overall, 105 non-fatal overdoses were reported by 471 participants over 1032 person-years. The incidence rate was 9.53 per 100 person-years (95%CI:7.79-11.53), with no statistically significant difference between men and women. Living with HIV was not significantly associated with non-fatal overdose for men (aHR:2.00;95%CI:0.83-4.82) or women (aHR:0.68;95%CI:0.25-1.80).

Among men, homelessness (aHR:3.42;95%CI:1.76-6.64), thoughts of suicide (aHR:2.79;95%CI:1.29-6.02), injection drug use (aHR:21.99;95%CI:7.75-62.38), needing help to inject (aHR:5.00;95%CI:2.58-9.67), psychological distress (aHR:1.74;95%CI:1.24-2.44), and living with HCV (aHR:3.92;95%CI:1.85-8.31) were risk factors for non-fatal overdose. While speaking traditional language at home when growing up (aHR:0.42;95%CI:0.18-1.00) was protective against non-fatal overdose.

Among women, homelessness (aHR:3.10;95%CI:1.70-5.64), experiencing violence (aHR:2.82;95%CI:1.61-4.94), sex work (aHR:1.98;95%CI:1.12-3.49), sexual assault (aHR:2.95;95%CI:1.29-6.77), thoughts of suicide (aHR:3.35;95%CI:2.05-5.46), psychological distress (aHR:1.74;95%CI:1.32-2.30), injection drug use (aHR:7.43;95%CI:3.98-13.85), alcohol bingeing (aHR:1.90;95%CI:1.01-3.59), trying unsuccessfully to access treatment (aHR:2.03;95%CI:1.03-4.02), needing help to inject (aHR:4.35;95%CI:2.49-7.59), and having been admitted to hospital (aHR:2.42;95%CI:1.30-4.50) were associated with non-fatal overdose.

These findings highlight the adverse role of structural violence and protective role of Indigenous language on non-fatal overdose among young Indigenous peoples in BC. There is an urgent need for safe supply and Indigenous-led policies to curtail trauma and deaths from drug overdoses.

216 Disruptions to sexual and reproductive health services during the COVID-19 pandemic among refugee youth in Uganda: implications for the HIV cascade

Isha Berry[1], Carmen Logie[2], Moses Okumu[3], Alyssa McAlpine[2], Robert Hakiza[4], Daniel Kibuuka Musoke[5], Peter Kymbadde[6,7], Lawrence Mbuagbaw[8]
[1]Dalla Lana School of Public Health, University Of Toronto, Toronto, Canada, [2]Factor-Inwentash Faculty of Social Work, University of Toronto, Toronto, Canada, [3]University of North Carolina, Chapel Hill, United States, [4]Young African Refugees for Integral Development (YARID), Kampala, Uganda, [5]International Research Consortium (IRC), Kampala, Uganda, [6]National AIDS Coordinating Program, Ugandan Ministry of Health, Kampala, Uganda, [7]Most at Risk Population Initiative (MARPI), Kampala, Uganda, [8]Department of Health Research Methods, Evidence and Impact, McMaster University, Hamilton, Canada

Background: The COVID-19 pandemic has caused global disruptions to sexual and reproductive health (SRH) services, including HIV prevention, testing, and care. Yet such disruptions are not well understood among the 79.5 million forcibly displaced persons globally. This study examined access to SRH services during the COVID-19 pandemic among refugee youth in Kampala, Uganda.

Methods: This mixed-methods study involved qualitative in-depth interviews (March 2021) with refugee youth aged 16-24 years and key informant professionals supporting refugee health and well-being. This was followed by a cross-sectional survey (April 2021) on COVID-19 impacts, nested within a longitudinal cohort of urban refugee youth in Kampala, Uganda. Data on individual and community access to SRH services and reasons for not accessing services were collected. Qualitative data were coded, and thematic analysis was used to identify themes related to SRH access. Leveraging quantitative data, we report access to, and utilization of, SRH services.

Results: Qualitative participants included 24 refugee youth (50% men; 50% women; mean age: 20.7, standard deviation [SD]: 2.3), and 6 key informants. Disrupted access to SRH services was identified as a significant problem facing refugee youth; linked with unplanned pregnancies, ART non-adherence, and transactional sex. Among survey participants (n=346, 48.0% men, 50.3% women, mean age: 21.2, SD: 2.6), one-third (35.0%) reported reduced community access to SRH services. Individuals reported not accessing contraception (94.5%), condoms (86.4%), HIV testing (81.2%), and pregnancy testing (94.8%). For SRH outcomes, 9.5% reported unplanned pregnancy and 8.7% engaged in transactional sex. Lack of transport, family poverty, and clinic closures were noted as reasons for reduced SRH access.

Conclusions: Among urban refugee youth, COVID-19 disrupted SRH service access and was linked with adverse outcomes. These results can be used to inform integrated HIV and SRH service delivery in humanitarian contexts to leave no one behind in accessing HIV prevention.

237 GetaKit: Applying Complex Adaptive System Theory to HIV Self-Testing Expansion in Ontario

Alexandra Musten[1], Patrick O'Byrne[2], Steven Winkelman[1], Abigail E. Kroch[1,3,4], Nikki Ho[2], Jennifer Lindsay[2]
[1]Ontario HIV Treatment Network, Toronto, Canada, [2]University of Ottawa, Ottawa, Canada, [3]Public Health Ontario, Toronto, Canada, [4]Dalla Lana School of Public Health, Toronto, Canada

Background: If HIV self-testing is to function as one of the prevention tools in our toolbox, then its implementation needs to adapt to external factors, including regional and population specific contexts. GetaKit – a research study to observe the outcomes of mailout HIV self-testing in the real-world – started as a pilot in the Ottawa region in July 2020 and expanded to 18 sites across Ontario since April 2021. This rapid scale-up across multiple diverse regions was informed by a complex adaptive system theory approach and was built on the premise that HIV testing – and self-testing – will not have uptake among diverse persons at-risk for HIV using a one-size-fits-all approach.

Methods: The implementation strategy for GetaKit includes: a division of labour between the core research team and ASO partner sites across Ontario; the identification of patterns of self-organization that permit flexibility and adaptability; and partnership with ASOs to implement local status-neutral linkage to prevention and care pathways.

Results: Using complex adaptive system theory to expand the GetaKit study reduced implementation timelines from 5 months to 4 weeks. ASO partners provided timely feedback and information that shaped training and resources, informed new registration pathways for participants with access barriers, and developed strategic promotional approaches to raise awareness of HIV self-testing among diverse people at high-risk for HIV.

Conclusions: Public health interventions are implemented in complex systems, requiring timely response to feedback and flexibility to adjust to local contexts. Moreover, self-testing requires a robust resource landscape to ensure that positive results are confirmed, people newly diagnosed are linked to HIV care, and people who test negative are linked to prevention services. GetaKit is an example of using a complexity lens to ensure that HIV self-testing is an effective conduit into the status-neutral care cascade across a varied landscape.

254 Indigenous Women's Cultural Safe Harm Reduction Model. Kotawe (start a fire): Igniting cultural responsiveness through community-determined intervention research. Sharing Kotawe's preliminary research journey

Miranda Keewatin[1], Leona Quewezance[1], Margaret Kisikaw Piyesis[1]
[1]*All Nations Hope Network, Regina, Canada*

Background: Kotawe (start a fire): Igniting cultural responsiveness through community-determined intervention research has created an opportunity for Indigenous women to reflect on and explore their relationships to their health and well-being and integrate traditional teachings of women's and girls' roles, responsibilities, ceremonies, songs, medicines and rites through ongoing, seasonally-driven, cultural intervention practices at All Nations Hope Network (ANHN). Indigenous people are over-represented in HIV/AIDS statistics, and the literature indicates that Indigenous women, in particular, are the most marginalized population in Canada. Yet there is a startling lack of gender-specific, Indigenous-specific, HIV/AIDS resources, programs and services.

Method: The Kotawe project has provided an opportunity for seven Indigenous women (Willow Warriors) to participate in Cultural Intervention Practices (CIP's) for a duration of 36 months in Saskatchewan. The goal of the study is to develop, implement, and assess the impact of land- and gender-based cultural interventions, addressing risk behaviours and contexts, mental health and trauma, and foster wellness among Indigenous women.
We have achieved this goal by exploring the women's experiences of the Cultural Intervention Practices in social, environmental, physical, spiritual, emotional, intellectual ways.

Results: The Kotawe project initiatives have come to encompass a range of culturally safe practices and programs proven to reduce the harms of colonial violence against Indigenous women. The focus has been on decreasing individual harm from problematic substance use through the provision of specific Indigenous knowledges, practices, and services has demonstrated an Indigenous woman's cultural safe harm reduction approach. The seasonal CIP's provide a gender-based analysis, including a determinants of health lens, to explore reducing harms associated with Indigenous women's experience from colonial violence. Through this work, the Willow Warriors have expressed that their high-risk behaviours have decreased, and they have begun their healing journey towards wellness.

282 Delivering COVID19 vaccine to people living with HIV through an AIDS service organization community partnership

Asli Mahdi[1], Cynthia Kaneza[1], Lila Jorgenson[1], Cory Wong[1], Haoua Inoua[1], Khaled Salam[1], **Jason Brophy[1,2]**
[1]AIDS Committee of Ottawa, Ottawa, Canada, [2]CHEO - University of Ottawa, Ottawa, Canada

Background: The intersection of the COVID19 and HIV pandemics has presented new but familiar challenges. While data on COVID19 vaccination in people living with HIV (PWLH) are only now beginning to emerge, the recommendation was made for all eligible populations (including PLWH, who are at higher risk of severe disease) to get vaccinated. However, historical distrust and fear of exploitation among racialized people has limited vaccine uptake despite their higher COVID19 burden.

Description: The AIDS Committee of Ottawa (ACO) partnered with Ottawa Public Health and Bruyère Family Medicine Clinic to provide a low-barrier COVID19 vaccination clinic for PLWH/people affected by HIV. Information sessions on COVID19 including vaccine safety and COVID19 burden among PLWH were held in partnership with Canadian AIDS Treatment Information Exchange to answer questions and build confidence. A first-dose clinic was held on 22-23/5/2021, with 438 people vaccinated; a second-dose clinic was held on 10-11/7/2021, with 238 people vaccinated. Government-issued identification was not required for vaccination. A survey of clients attending the second clinic was conducted.

Lessons learned: 236/238 (99%) of clients responded. 71% identified as racialized, with the largest group identifying as Black (49%). Most were <40 years (28% 30-39; 29% 18-29; 9% 12-17), with 51% male, 43% female, and 5% transgender/non-binary/gender non-conforming/two-spirited. Most were Canadian citizens (78%), with 14% permanent residents, 3% temporary residents, 3% refugees. Respondents noted convenient location (97%), ease of booking appointment (96%), and culturally-safe care (99%) as ways the clinic had reduced barriers for them to get vaccinated.

Conclusions: This low-barrier, culturally-safe approach to providing COVID19 vaccine to PLWH is an excellent example of how to reach racialized/marginalized populations to help address the COVID19 pandemic. Community-based organizations represent trusted allies that can address vaccine hesitancy and lack of trust in partnership with public health services to deliver necessary care to these populations.

308 Association of illicit fentanyl use with injection risk practices among people who inject drugs

Kathleen S. Kenny[1], Gillian Kolla[2,3], Debbie Phillips[3], Sarah Greig[4], Molly Bannerman[5], Jason Altenberg[4], Carol Strike[6], Ahmed M. Bayoumi[3,6]
[1]University Of Manitoba, Winnipeg, Canada, [2]University of Victoria, Victoria, Canada, [3]Unity Health, Toronto, Canada, [4]South Riverdale Community Health Centre, Toronto, Canada, [5]Women and HIV/AIDS Initiative, Toronto, Canada, [6]University of Toronto, Toronto, Canada

Background: Use of illicit fentanyl and related analogues may lead to more frequent injections and risky injection-related practices. We investigated the association between injection fentanyl use and sharing of injection equipment among who people who inject drugs.

Methods: In a cross-sectional study in Toronto, we surveyed 249 people who inject drugs in 2019 whom we recruited in supervised consumptions services. We estimated the average marginal effect of fentanyl injection frequency (daily, less than daily, none) on the probability of sharing injection equipment, adjusting for age, gender, incarceration, homelessness, and frequencies of other drugs injected.

Results: In the last 6 months, 117 (47.0%) of participants injected fentanyl daily, 49 (19.7%) less-than-daily, and 78 (31.3%) did not inject fentanyl. Multivariable models showed that participants injecting fentanyl daily had probabilities of 23.9% (95% confidence level [CI] 14.0%, 32.7.%) of sharing a syringe, 41.2% (95% CI 30.9%, 51.5%) of sharing a cooker, and 29.1% (95% CI 19.3, 38.9) of sharing a filter. Participants injecting fentanyl less-than-daily had probabilities of 20.9% (95% CI 4.2%, 37.6%) of sharing a syringe, 36.3% (95% CI 17.5, 55.1) of sharing a cooker, and 29.4% (95% CI 11.2%, 47.7%) of sharing a filter. Participants who did not inject fentanyl had probabilities of 5.5% (95% CI 0.0%, 11.7%) of sharing a syringe, 12.4% (95% CI 3.0%, 21.8%) of sharing a cooker, and 11.3% (95% CI 2.6%, 20.1%) of sharing a filter.

Conclusions: People who regularly used fentanyl reported injection practices that increased risk for infectious disease transmission. Innovative approaches to reduce these risks are needed.

Key Populations Oral Abstracts / Les populations clés eposés oraux

22 Dual Selections Reveal Favorable Doravirine and Islatravir Responses against HIV-1 Clinical Isolates Harboring Multiple NRTI and NNRTI Resistance Mutations

Bluma Brenner[1], Maureen Oliviera[1], Ruxandra-Ilinca Ibanescu[1], Jean-Pierre Routy[2]
[1]Lady Davis Institute, Montreal, Canada, [2]McGill University Health Centre, Montreal, Canada

Background: Doravirine is a recently licensed HIV non-nucleoside reverse transcriptase inhibitor with improved efficacy against viruses harboring resistance to efavirenz and nevirapine, showing limited cross-resistance to rilpivirine. In this in vitro study, resistance, and cross-resistance to doravirine was analyzed in a representative panel of clinical isolates harboring NRTI- and NNRTI-multidrug resistance.

Methods: Peripheral blood mononuclear cells infected with clinical viral isolates (n=8) harboring NRTI and NNRTI resistance mutations were passaged in rising concentrations of single and dual drugs treatments. Genotypic analysis monitored the acquisition and accumulation of drug resistance mutations at weeks 16 and 24 following selective drug pressure. Cell-based phenotypic assays assessed levels of resistance and cross-resistance of selected variants to NNRTIs.

Results: Doravirine showed potency on six viral variants harboring K65R or multiple thymidine analogue mutations (TAMs). Sustained pressure of viral variants with doravirine resulted in the acquisition of V108I (4/6), L234I (4/6), Y318F (2/6), V106A/I (2/6), F227 (1/6) and Y318F (1/6) mutations. The genetic barrier to doravirine was improved when paired with islatravir or lamivudine. One isolate escaped doravirine pressure, harboring TAMs, M184V and NNRTIs (K103N, Y181C and F318F) that retained rilpivirine susceptibility. The second variant harbored complex L74I, Y115F Q151M/M184V/G190A multidrug resistance with severe impaired replicative fitness precluding drug escalation. rilpivirine.

Discussion: Doravirine, paired with islatravir, shows favorable efficacy against viral variants harboring TAMs/M184VI/NNRTI multidrug resistance. The long intracellular half-life of Islatravir, suggest the opportunity for therapeutic options against resistant viruses that continue to arise in middle and low income settings.

50 “Peace of mind”: PrEP Use, HIV-Related Anxiety and HIV Stigma in Gay, Bisexual and Other Men Who Have Sex with Men in British Columbia

Alex Wells[1], Mark Gaspar[2], Mark Hull[3], Darrell Tan[2,4], Daniel Grace[2], Nathan Lachowsky[1]
[1]University Of Victoria, Toronto, Canada, [2]University of Toronto, Toronto, Canada, [3]Faculty of Medicine - University of British Columbia, Vancouver, Canada, [4] St. Michael's Hospital, Toronto, Canada

Background: HIV-related anxiety is experienced by many gay, bisexual, and other men who have sex with men (GBM). Pre-exposure prophylaxis (PrEP) effectively prevents HIV acquisition and may help to reduce HIV-related anxiety. While research has examined the mental health impacts of PrEP use among GBM there is a lack of research that explores how PrEP use impacts HIV-negative GBM’s feelings of HIV-related anxiety and having sex with GBM who are living with HIV.

Methods: As part of a mixed-methods study on Scaling up PrEP Implementation (PRIMP), we conducted semi-structured interviews with 20 HIV-negative GBM, all of whom were current or former PrEP users living in British Columbia. Interviews focused on their experiences getting access to and taking PrEP. Participants were asked about PrEP’s impact on their sexual health, mental health, and their perspectives on having sex with people living with HIV. The data was analyzed and coded using thematic analysis.

Results: Prior to being prescribed PrEP, several participants described experiencing high levels of HIV-related anxiety that negatively impacted their romantic and sexual lives. Nearly all participants identified feeling less anxious and having a “peace of mind” about contracting HIV as a result of being prescribed PrEP. While some participants described being comfortable having sex with someone who is living with HIV, many still felt reticent, or outright rejected this possibility. This is despite the fact that these participants had knowledge of PrEP’s efficacy and campaigns like Undetectable=Untransmissible.

Discussion and Implications: Our findings support the broader impact of PrEP to support the mental health and HIV-related anxiety reduction of HIV-negative GBM. However, the decline of HIV-related anxiety did not fully eliminate stigmatizing attitudes about people living with HIV.

105 Peers4Wellness: Indigenous Approaches to Peer-Led Wellness Care and Research for Indigenous Womxn with Lived and Living Experiences of HIV and/or hepatitis C

Sharon Jinkerson-Brass[1], **Candice Norris**[1], Sadeem Fayed[1,2], Alexandra King[1,2]
[1]University of Saskatchewan, Saskatoon, Canada, [2]Simon Fraser University, Vancouver, Canada

Place: Peers4Wellness is a community based participatory action research (CBPAR) study. In British Columbia, the study is situated on the traditional unseeded lands of the Coast Salish people in the Metro Vancouver and Fraser Valley regions, with a particular focus on the Downtown Eastside (DTES) of Vancouver. Acadamically, the study is housed at Simon Fraser University and the University of Saskatchewan. The principal investigator is Dr. Alexandra King. Peers4Wellness launched in 2017 with catalyst-funding and is now funded by the CIHR (#401360).

Intention: The goal of Peers4Wellness is to support the wellness of Indigenous womxn with lived and living experiences of HIV and/or hepatitis C (HCV). The scope of Peers4Wellness involves a community needs assessment and community led programming. The objectives of the study are to introduce applied models for HIV/HCV wellness care and research that culturally responsive and peer led.

Protocols: Peers4Wellness applies an emerging Indigenous research framework that is grounded in Indigenous ceremony and shaped by etuaptmumk (Two-eyed-Seeing) theory. The study privileges Indigenous ways of knowing, being and doing as well as centering lived/living experiences and community wisdom. Peers4Wellness also weaves in relevant Western and academic knowledges and practices. The ensuing research methodology manifests through a collaborative leadership including an Indigenous Knowledge Holder, an Indigenous woman with lived and living communal and HIV/HCV experiences, community-based organization(s), community representatives, academic allies and an Indigenous principal investigator.

Journey: This presentation will share some Peers4Wellness learnings. First, we will highlight some key findings from the needs assessment and how they informed the programing stage of the study. Then, we will introduce an innovative community designed wellness program for HIV/HCV that is Indigenous, peer led and community based in the DTES. Finally, we will showcase the Peers4Welness process Bundle, which guides the study's engagement in culturally responsive and peer led CBPAR.

109 An End to HIV Exceptionalism: How Indigenous Peoples are Forgotten

Sean Hillier[1], **Ryan Gladwin**[1], Elias Chaccour[1]
[1]*York University, Toronto, Canada*

Historically, HIV/AIDS rates and outcomes have generated discussion and enactment of exceptionalism policy. This type of policy recognizes the exceptional needs of individuals living with HIV/AIDS and is primarily driven by stigma. HIV-specific policies are critical because HIV/AIDS is an exceptional health issue that warrants specific direction, as its transmissibility and impacts are unlike other diseases. However, in recent years there have been mounting calls to end exceptional HIV policies in 'western developed countries'.

In Canada, the healthcare needs of many Indigenous Peoples fall under the jurisdiction of the Federal Government, be it through direct service provision or funding. The estimated HIV prevalence rate for Indigenous Peoples in Canada in 2016 was two times higher than the general population. Despite Indigenous Peoples making up only 4.9% of the population, Indigenous women accounted for 30.9% of new HIV cases in Canadian women, and Indigenous men accounted for 16.3% of new HIV cases in Canadian men. However, the federal and provincial governments in Canada lack any exceptional HIV/AIDS policy targeted towards Indigenous Peoples living with HIV/AIDS (IPLHA), and no specific policy directs care, services, or funds to Indigenous communities facing an HIV epidemic. We continue to see governments that refuse, or are reluctant, to solve the problem with an "exceptional" policy.

Using an Indigenous Knowledge Policy Framework, we critically analyze federal and provincial health policies gained through Freedom of Information Requests and argue that governments need to create policies that address the exceptional needs of IPLHA. We argue that there is a need for exceptional policies to address the issue of HIV/AIDS treatment and programming, as existing measures are not adequately dealing with the challenges IPLHA's face, including issues of stigma, privacy, confidentiality, treatment, and autonomy that continue to disproportionately impact communities and the efforts to address the increase of new infections.

121 COVID-19, associated public health responses and gaps in remote/virtual care among women living with HIV: a mixed methods study

Prerna Thaker[1], Andrea Krüsi[1,2], Mika Ohtsuka[1], Tara Axl-Rose[1], Melanie Lee[1], Braschel Melissa[1], Emma Kuntz[1], **Kathleen Deering**[1,2]
[1]CGSHE, Vancouver, Canada, [2]Faculty of Medicine, UBC, Vancouver, Canada

Background: In Canada, women living with HIV (WLWH) continue to face many barriers to accessing health care services, alongside other social and structural inequities. This mixed methods study assessed the experiences accessing health care services among WLWH in the context of COVID-19.

Methods: We drew on a COVID-19-specific quantitative survey with 166 cis and trans WLWH (April/2020-August/2021) as part of the SHAWNA Project, an open longitudinal community-based research study with WLWH in Metro Vancouver. We conducted 28 semi-structured interviews with a subset of WLWH in SHAWNA (May/2020-July/2020). This research was guided by a socio-ecological framework to understand the experiences of WLWH accessing health care during the COVID-19 pandemic.

Results: Among 166 women, with 6.0% identifying as trans, 53.0% were Indigenous, 35.5% were White, and 10.2% were Black and/or otherwise racialized. Overall, 45.2% of participants reported increased difficulty accessing routine healthcare since COVID-19 began, and 28.3% reported increased difficulty accessing HIV care. Overall, 10.8% reported difficulties accessing antiretroviral therapy (ART), while 15.1% reported increased access to ART. In qualitative interviews, some women described that the shift to remote/virtual care and appointments was convenient and alleviated fear of exposure to COVID-19, while others described negative impacts on confidentiality and establishing rapport with providers. Further, the shift to remote/virtual care had a substantial impact on continuity of care/interprofessional care (e.g. HIV-related blood work, mammograms), resulting in delays in accessing services. Drug use stigma and discrimination, a common barrier to accessing pain medications, was exacerbated for some participants. This was further complicated by the shift to remote/virtual care preventing physical exams.

Conclusion: Our findings indicate challenges and opportunities in the context of many health services providers continuing to provide remote/virtual care and limit in-person services. Our study highlights the importance of trauma-informed health services with WLWH in all care environments to support health access.

122 Effects of Discrimination, Psychological Distress, and Coping Responses on Methamphetamine Use Among Gay, Bisexual, and Other Men Who Have Sex with Men (GBM) Living with HIV and HIV-Negative GBM

Graham Berlin[1], Syed Noor[1,2], Shayna Skakoon-Sparling[1], Adhm Zahran[1], Kiffer G. Card[3,10], Nathan J. Lachowsky[3,8], Joseph Cox[4,5], David Moore[6], Gilles Lambert[5,9], Mark Gaspar[7], Jody Jollimore[8], Daniel Grace[7], Abbie Parlette[1], Allan Lal[6], Jordan Sang[6], Cornel Grey[7], Emerich Daroya[7], Trevor A. Hart[1,7]

[1]X University (formerly Ryerson), Toronto, Canada, [2]Louisiana State University Shreveport, Shreveport, USA, [3]University of Victoria, Victoria, Canada, [4]McGill University , Montréal, Canada, [5]Research Institute of the McGill University Health Centre, Montréal, Canada, [6]British Columbia Centre for Excellence in HIV/AIDS, Vancouver, Canada, [7]University of Toronto, Toronto, Canada, [8]Community-Based Research Centre, Vancouver, Canada, [9]Institute National de Santé Publique du Québec, Montréal, Canada, [10]Simon Fraser University , Vancouver, Canada

Background: Approximately 8-20% of Canadian GBM report past year methamphetamine use; most occurs in a sexual context. Methamphetamine use can be associated with adverse sexual health outcomes, including increased risk of HIV transmission. Psychosocial factors associated with methamphetamine use remain understudied. Using structural equation modeling, we tested factors associated with methamphetamine use among GBM living with HIV and HIV-negative GBM.

Methods: We examined baseline data from 2,449 GBM recruited using respondent-driven sampling (RDS) in Montreal, Toronto, and Vancouver (Engage Cohort Study). Structural equation models were fit using weighted least squares estimation and adjusted for sampling bias (RDS-II weights) and demographic covariates, including race/ethnicity. We examined measures of heterosexist discrimination, childhood sexual abuse, psychological distress, sexual compulsivity, and cognitive escape (i.e., using drugs to avoid thinking about sexual risks) as factors associated with recent methamphetamine use.

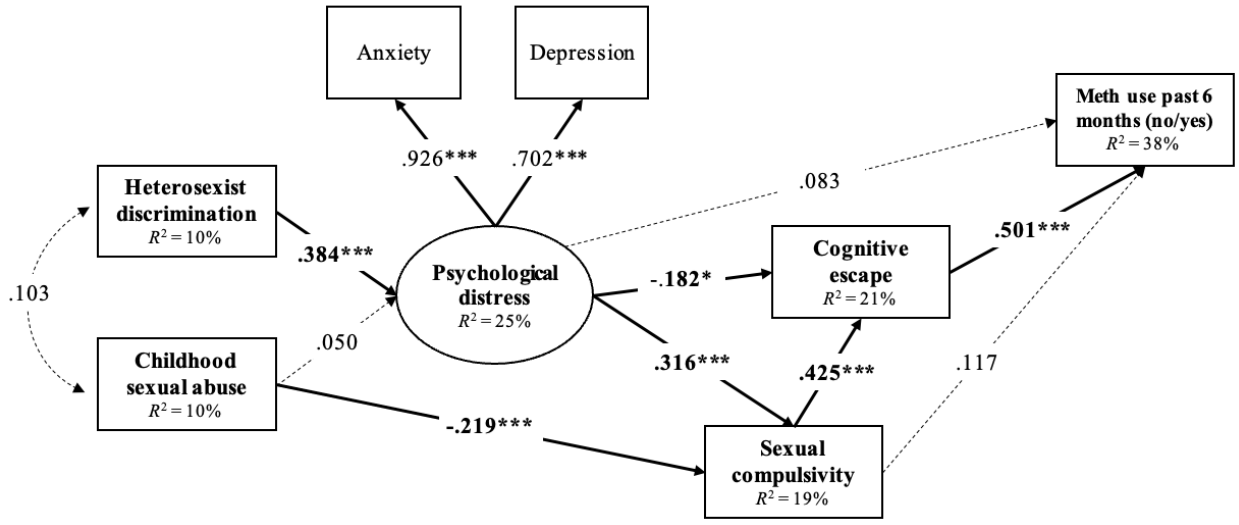
Results: 28% of GBM living with HIV (n=423) and 4% of HIV-negative (n=1800) participants reported methamphetamine use in the past six months, respectively. The hypothesized models (see Figure 1) fit the data well (CFIs≥.95, RMSEAs≤.03). Among both subsamples, discrimination was positively associated with psychological distress and psychological distress was indirectly associated with recent methamphetamine use through sexual compulsivity and cognitive escape.

Conclusion: Methamphetamine use is more common among GBM living with HIV than HIV-negative GBM. GBM's methamphetamine use may be related to coping with discrimination-based psychological distress. Sexual compulsivity and cognitive escape are two coping behaviours that mediated this relationship. Interventions to reduce potential methamphetamine-related harms need to consider the motivations for sexualized methamphetamine use.

Supporting Document

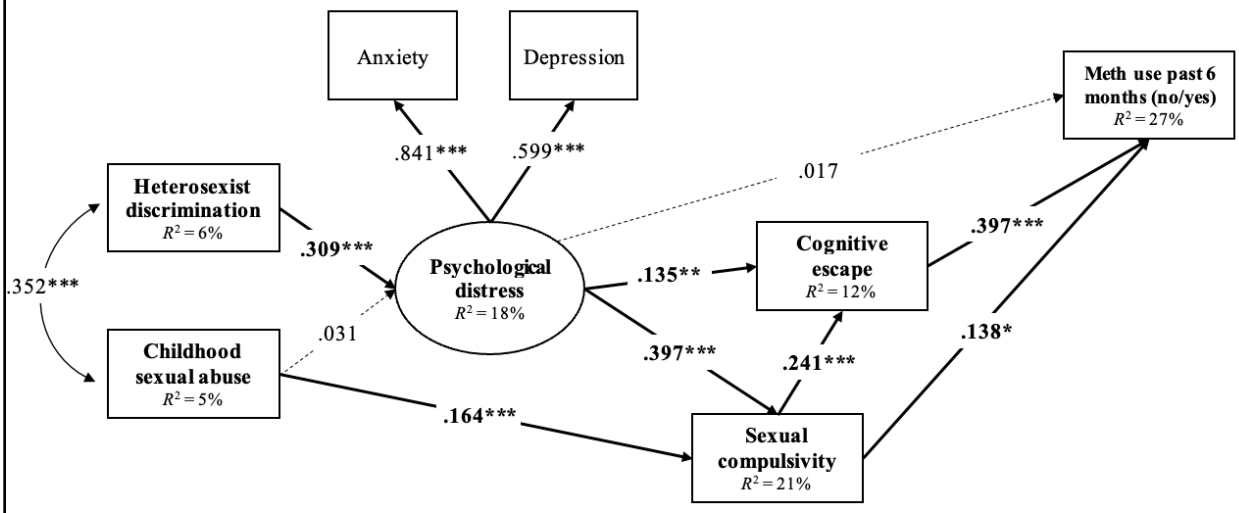
Figure 1

Living with HIV Subsample



Note. Model fit statistics: $\chi^2(df = 14, N = 423) = 18.84$, $p = .17$; RMSEA = .03, 95% CI (.00, .06); CFI = .95; WRMR = .38. Standardized path coefficients and factor loadings. *$p < .05$, **$p < .01$, *** $p < .001$. Dashed paths are non-significant. **Standardized indirect effects:** psychological distress → sexual compulsivity → cognitive escape (= .14, $p = .005$), sexual compulsivity → cognitive escape → methamphetamine use (= .21, $p < .001$), psychological distress → sexual compulsivity + cognitive escape → methamphetamine use (= .07, $p = .014$).

HIV-negative Subsample



Note. Model fit statistics: $\chi^2(df = 14, N = 1800) = 23.37$, $p = .05$; RMSEA = .02, 95% CI (.00, .03); CFI = .98; WRMR = .51. Standardized path coefficients and factor loadings. *$p < .05$, **$p < .01$, *** $p < .001$. Dashed paths are non-significant. **Standardized indirect effects:** psychological distress → sexual compulsivity → cognitive escape (= .10, $p < .001$), sexual compulsivity → cognitive escape → methamphetamine use (= .10, $p < .001$), psychological distress → sexual compulsivity + cognitive escape → methamphetamine use (= .04, $p < .001$).

132 “Are you the one who ate the bat?”: BIPOC Gay and Bisexual Men’s Experiences of Racial Discrimination during Multiple Pandemics

Cornel Grey[1], Shayna Skakoon-Sparling[2], Ian Liujia Tian[1], Emerich Daroya[1], Ben Klassen[3], David Lessard[4], Mark Gaspar[1], Jad Sinno[1], Amaya Perez-Brumer[1], Nathan Lachowsky[5], David M. Moore[8], Gilles Lambert[6,7], Jody Jollimore[3], Trevor Hart[2,1], Joseph Cox[4], Daniel Grace[1]
[1]University Of Toronto, Toronto, Canada, [2]X University, Toronto, Canada, [3]Community-Based Research Centre, Vancouver, Canada, [4]McGill University, Montreal, Canada, [5]University of Victoria, Victoria, Canada, [6]Direction régionale de santé publique, Montreal, Canada, [7]Institut national de santé publique du Québec, Quebec City, Canada, [8]BC Centre for Excellence in HIV/AIDS, Vancouver, Canada

Background: Epidemics impact individuals unevenly across race, gender, and sexuality. Recent scholarship on COVID-19 & HIV– as well as COVID-19 and racism–have utilized the construct of a 'double pandemic' to describe ongoing crises in public health. We examined how racism framed experiences of COVID-19 public health measures for gay, bisexual, and queer men (GBM) of colour in Canada.

Methods: Engage-COVID-19 is a mixed methods study examining the impact of COVID-19 on GBM living in Vancouver, Toronto, and Montreal. We conducted two rounds of qualitative interviews (11/2020-01/2021 and 06/2021-10/2021) with GBM of colour (n=59) where they shared their experiences of the COVID-19 pandemic, including experiences with discrimination. Interviews were coded in NVivo software using critical race theory as an analytical framework.

Results: Participants’ age ranged from 24 to 64 yrs/old. The majority of participants identified as Mixed Race (n=22), East Asian (n=14) and Black (n=8). Nineteen percent were living with HIV (n=11). Several GBM described their experiences of discrimination during COVID-19 in relation to other epidemics their communities have faced, including HIV. Some GBM also underlined how COVID-19 strengthened these dynamics, resulting in racialized communities being more vulnerable to contracting COVID-19. Some GBM also felt more exposed to racism during the COVID-19 pandemic, including xenophobic harassment. Some participants expressed concern about accessing health services during the pandemic for fear of discrimination and others described how COVID has increased their experiences with sexual racism.

Conclusion: How GBM of colour experience epidemics like HIV and COVID-19 is often tied to racism, which continues to negatively impact the health of GBM of colour. For these participants, racism affects their relationships with healthcare providers and potential partners. Public health interventions that position racism as one among several epidemics risk ignoring the specific ways racism exceeds the lifetimes of viral epidemics like HIV and COVID-19.

136 Clinical outcomes and healthcare costs among safer opioid supply program clients in Ontario: a population-based cohort study

Gillian Kolla[1], Tara Gomes, Daniel McCormack, Andrea Sereda, Sophie Kitchen, Tonya Campbell, Samantha Singh, Tony Antoniou
[1]*University Of Victoria, Victoria, Canada*

Background: Safer opioid supply (SOS) programs – where clients are prescribed pharmaceutical opioids (generally hydromorphone tablets) and provided comprehensive health/social supports – are a novel yet controversial intervention to reduce health risks associated with the unregulated drug supply. London Intercommunity Health Centre (LIHC) developed Canada's first SOS program in 2016.

Methods: We conducted a population-based matched cohort study of London, Ontario residents diagnosed with opioid use disorder (OUD) between January 1, 2016 and March 31, 2019. All LIHC SOS clients who entered the program during the study period and who could be linked to ICES data were matched on demographic and clinical characteristics to London residents with OUD unexposed to the program. Primary outcomes were emergency department (ED) visits, hospitalizations, hospitalizations for infections, and total healthcare costs (excluding primary-care). We compared rates of each outcome in the year preceding and following index and used ARIMA models to evaluate impacts of SOS program initiation.

Results: Compared to the matched unexposed group, SOS clients were more likely to have HIV (34.1% vs. 7.6%; STD 0.69), hepatitis C (69.5% vs. 25.3%; STD 0.99), and hospitalizations for substance use disorder (18.3% vs. 9.5%; STD 0.26) and skin/soft tissue infections (18.3% vs. <6.1%; STD >0.10) at cohort entry. In the year following cohort entry, rates of ED visits (3.09 vs. 2.12 per person-year; $p<0.001$), inpatient hospitalizations (0.91 vs. 0.42 per person-year; $p<0.001$), hospitalizations for incident infections (0.32 vs. 0.16 per person-year; $p=0.03$), and healthcare costs ($15,287 vs. $7,237 per capita; $p=0.001$) declined significantly among SOS clients. Among unexposed individuals, no change in primary outcomes were observed.

Conclusion: While continuing research on SOS programs is necessary, the significant decline in hospitalizations among SOS clients alongside the lack of increase in infections, opioid-related deaths or all-cause mortality provides reassuring initial data on the safety of SOS programs.

147 A Roadmap for Implementing Injectable Opioid Agonist Therapy: Learnings from a Three-Year Pilot Project

Rosalind Baltzer Turje[1], Scott Elliott[1], Patrick McDougall[1], Cheryl McDermid[1], Mark Holland[1], Damon Hassan[1], Courtney Pankratz[1]
[1]*Dr. Peter Centre, Vancouver, Canada*

ISSUE: Since the onset of COVID19, Canada has experienced an unprecedented number of accidental drug toxicity deaths. Injectable opioid agonist therapy (iOAT) is a promising treatment option for people who use drugs (PWUD) that provides prescription grade opioids as a replacement to an increasingly toxic street supply. Scaling up iOAT services may help to circumvent the devastating impact that dual public health emergencies have had on PWUD.

DESCRIPTION: The Dr. Peter Centre (DPC) is the first community agency in North America to implement iOAT services. DPC has been tracking lessons learned and mobilizing knowledge gained to expedite the efforts of organizations in the early stages of iOAT implementation. There are particular considerations for community agencies implementing iOAT services that include establishing strategic partnerships and developing policies and practices that meet regulatory requirements.

LESSONS LEARNED: To mobilize the spread of iOAT services across Canada, this presentation will share findings from a process evaluation of the implementation of iOAT within a community agency setting. It will discuss key learnings for community agencies seeking guidance on the implementation of iOAT services, including opportunities for funding, sourcing medications, addressing iOAT prescriber shortages, establishing partnerships with local pharmacy teams, and navigating complex regulatory requirements.

RECOMMENDATIONS: iOAT is an effective treatment option that reduces the risk of overdose and HIV transmission for PWUD. With the unprecedented and relentless rise in overdose deaths exacerbated by COVID19, there is a need for the rapid implementation of iOAT services in diverse community settings. By sharing key learnings, this presentation aims to expedite the start-up and roll out of iOAT services for community agencies across Canada, contributing to a decrease in overdose deaths.

155 Examining the impacts of the COVID-19 pandemic on syndemic conditions and related effects on PrEP use among gay, bisexual and other men who have sex with men in Vancouver, Canada

Jordan Sang[1], David Moore[1,2], Lu Wang[1], Jason Chia[1], Junine Toy[1], Julio Montaner[1,2], Shayna Skakoon-Sparling[3], Joseph Cox[4,5], Gilles Lambert[5,6], Daniel Grace[7], Trevor Hart[3], Allan Lal[1], Jody Jollimore[8], Nathan Lachowsky[8,9]

[1]Bc Centre for Excellence in Hiv/aids, Vancouver, Canada, [2]University of British Columbia, Vancouver, Canada, [3]Ryerson University, Toronto, Canada, [4]McGill University, Montreal, Canada, [5]Direction régionale de santé publique -Montréal, CIUSSS Centre-Sud-de-l'Ile-de-Montré, Montreal, Canada, [6]Institut national de santé publique du Québec, Montreal, Canada, [7]University of Toronto, Toronto, Canada, [8]Community-Based Research Centre, Vancouver, Canada, [9]University of Victoria, Victoria, Canada

Background: The secondary impacts of the COVID-19 pandemic may disproportionately affect the health and wellbeing of gay, bisexual and other men who have sex with men (GBM), particularly related to HIV. We assessed trends of syndemic production and trends and correlates of pre-exposure prophylaxis (PrEP) interruptions among HIV-negative/unknown GBM in Vancouver.

Methods: Sexually-active GBM, aged ≥16 years, were recruited through respondent-driven sampling (RDS) from February 2017-August 2019. Participants completed a Computer-Assisted Self-Interview every 6 months and data were linked to BC HIV Drug Treatment Program to assess PrEP uptake and continuation. We used univariable generalized-linear mixed models to examine 1) trends in syndemic conditions (i.e. anxiety, depression, interpersonal violence, polysubstance use, alcohol use) and 2) trends in PrEP interruptions (6-month periods) among HIV-negative/unknown GBM. We also applied 3-level mixed-effects logistic regression with RDS clustering to examine the individual additive and interaction effects of syndemics on PrEP use among GBM reporting PrEP use before study visit. Follow-up analyses includes data from before and during the COVID-19 pandemic (March 2018-April 2021).

Results: Our study included 760 participants/data on 2339 visits, from March 2018-April 2021. Depressive symptoms increased over the study period (OR=1.33, 95%CI=1.14-1.54) with an increase after the onset of COVID-19 in Canada. We also found a trend of increased PrEP interruptions over time (aOR=2.59, 95%CI=1.96, 3.42). The time-period after the onset of COVID-19 (Sept 2020-April 2021) had greater odds of PrEP interruptions (aOR=16.33, 95%CI=4.73, 56.44) compared to the March 2018-March 2020 time-period. The only associated syndemic condition was depression (aOR=7.22, 95%CI=1.12,46.47). We did not find interactions with other syndemic conditions.

Conclusions: We found increased depressive scores and PrEP interruptions among HIV-negative/unknown GBM since the onset of COVID-19. Additional mental health services and targeted follow-up for assessment for PrEP continuation may be needed to mitigate the impacts of the pandemic on GBM.

199 Resilience and HIV Prevention for Heterosexual Black Men in Toronto, Canada: Making places "Where the brothers can feel comfortable to be a part of the conversation."

Charmaine Williams[1], Desmond Miller[2], Winston Husbands[3], Josephine Wong[2]
[1]University Of Toronto, Toronto, Canada, [2]Ryerson University, Toronto, Canada, [3]Ontario HIV Treatment Network, Toronto, Canada

Background: Heterosexual Black men (HBM) are in communities facing disproportionate HIV risk in Canada; however, they have received limited attention in HIV prevention. The weSpeak study explored how HBM in Ontario navigate HIV risk, to inform population-specific, strengths-based HIV intervention. Resilience was explored as research suggests it is a useful concept for HIV prevention, although conventional resilience models may be misaligned with the values and realities of HBM.

Methods: In Toronto, 7 audio-taped focus group interviews lasting 60-150 minutes were conducted with 54 self-identified heterosexual Black men ranging in age from 16 to 71 years. Five focus groups were convened with men grouped by age range, one was convened for francophone men, and another for men living with HIV. The men identified their ethnoracial identities as African (n=25), Caribbean (n=21) and Black (n=8). Research team members applied thematic analysis to transcribed interview data to derive participant perspectives on connections between resilience and HIV.

Results: The participants described HIV as like other threats, including systemic racism, that HBM have navigated with resilience in past and present. The participants refused definitions of resilience associated with vulnerability in favour of models that emphasized multigenerational strength, determination and commitment to others that empowered HBM to overcome threats, protect themselves, and mobilize community resilience against HIV. All participants advocated for HBM-specific HIV prevention that foregrounded HBM-specific realities and resiliencies. They saw a role for HBM leadership in community-wide efforts to increase HIV literacy, but HIV-positive men identified stigma as a barrier to their full participation in these efforts.

Conclusions: Participants suggest that emphasizing the specific resiliencies HBM value and identify is key to engaging them more effectively in HIV prevention. Strengths-based prevention efforts would position HBM as consumers and collaborators in reducing the threat of HIV in Canada’s Black communities.

201 Relational Approaches to HIV Prevention: Arts-and Land-Based Approaches to Building Healthy Relationships with Northern and Indigenous Youth in the Northwest Territories for Fostering Sexual Wellbeing

Candice Lys[1], Carmen Logie[2], Shira Taylor[1], Clara MacNamee[2], Kayley Inuksuk Mackay[1], Lesley Gittings[2], Charlotte Loppie[3]
[1]Fostering Open eXpression among Youth (FOXY), Yellowknife, Canada, [2]University of Toronto, Toronto, Canada, [3]University of Victoria, Victoria, Canada

Background: Sexual health is comprised not only of HIV prevention and management, but also sexual and gender-based violence prevention. While the bidirectional linkages are well established between intimate partner violence (IPV) and HIV, less is known about approaches to fostering healthy relationships among adolescents in the Northwest Territories (NWT), Canada. As the NWT has among Canada's highest STI prevalence, alongside IPV rates 7-fold the national average, strengths-focused approaches to healthy relationships hold the potential for advancing sexual health and in turn HIV prevention with Northern and Indigenous adolescents.

Methods: A NWT-based Indigenous sexual health agency, Fostering Open eXpression among Youth (FOXY), and their counterpart Strength, Masculinities, and Sexual Health (SMASH), conduct annual Peer Leader Retreats at a fly-in lodge in the NWT for youth aged 12-17. Retreats include land-based learning, Indigenous teaching, and arts-based methods. We conducted thematic analyses on data collected from 24 focus groups conducted with participants between 2017-2019 with a focus on relational factors.

Results: There were 286 retreat participants (87% Indigenous, 69% young women) and of these, 158 participants (n=36 young men, n=122 young women) participated in post-retreat focus groups. Key themes included: a) learning to identify healthy/unhealthy relationships; b) reflecting on one’s role in perpetrating abusive practices in dating relationships alongside commitment to change; c) new insight of being in an unhealthy relationship together with options for leaving; d) communication skills; e) social and emotional support resources. Participants also discussed learning about healthy relationships from peer leader role modelling, including in intimate relationships and motherhood.

Discussion: Relationality is central to Indigenous ways of knowing and includes the interconnections between people, nature, and the land as well as connections between physical, mental, emotional, and spiritual wellbeing. Land-based learning holds the potential to foster sexual health and create enabling HIV prevention environments with Northern and Indigenous adolescents.

210 Sustainability of Benefit of a Comprehensive Community Program to Prevent HIV amongst PWID, London Ontario

Michael Silverman[1], Shaya Dhinsa[2], Alison Locke[2], Sonja Burke[3], Blair Henry[3], Brian Lester[3], Laura Ball[1], Meera Shah[3], Kelly Muhsin[4], Cassandra Fisher[4], Sharon Koivu[1], Lise Bondy[1], Megan Devlin[1]
[1]Western University, London, Canada, [2]Middlesex-London Health Unith, London, Canada, [3]Regional HIV/AIDS Connection, London, Canada, [4]St. Joseph's Health Care, London, Canada

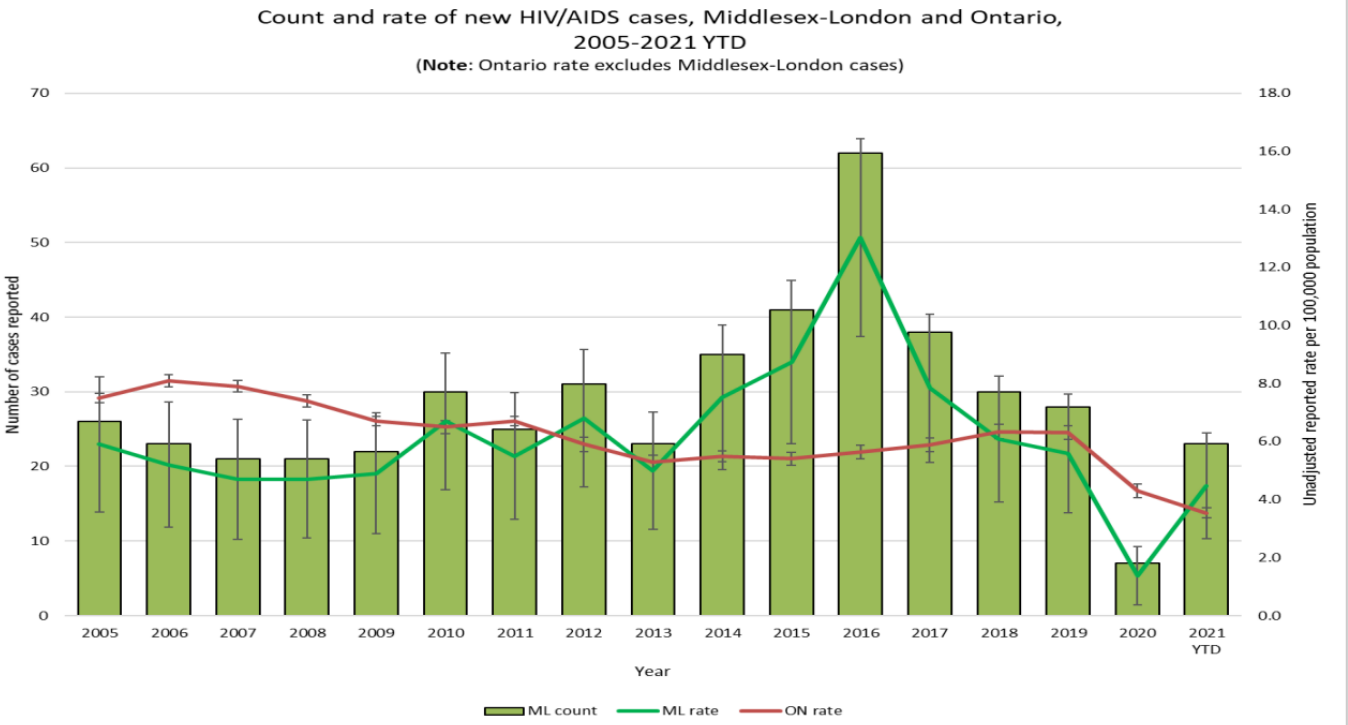
Background: London, Ontario experienced a severe HIV outbreak amongst PWID in 2015-2016 despite widespread distribution of sterile injection drug use equipment (IDU-E). Investigations demonstrated that use of hydromorphone-controlled release encouraged sharing of “washes” and also preserved HIV viability within the shared IDU-E.

Methods: In 2016 a multidisciplinary team was brought together representing the local public health unit, AIDS Service organization, Housing services, indigenous groups, Addiction specialists, HIV care providers, a local health center and the city academic hospital-based HIV Clinic. In addition to ongoing contact tracing new Interventions included 1) A comprehensive program involving team based care which involved regular meetings to discuss cases focusing on establishment of housing and linkage to services 2) A “cook-your drug” campaign to educate PWID to heat “washes” with a cigarette lighter until bubbling (including providing free cigarette lighters with needle distribution kits 3) An educational campaign for physicians to reduce prescribing of long acting hydromorphone (and substitute immediate release preparations) 4) A health unit sponsored outreach campaign to assist patients to attend HIV clinic appointments. 5) Linkage to housing services 6) A supervised overdose prevention site was opened in Feb 2018.
Review of regional annual HIV Incidence between 2006-2021.

Results: A rapid rise in HIV incidence was demonstrated in London-Middlesex with incidence rising to be significantly above that in Ontario in 2015 and 2016 with 75% of cases being in PWID. With institution of the comprehensive program, HIV incidence rapidly declined in 2017 to no longer be different than province wide rates and the fall was sustained through 2021 (Fig1).

Discussion/Conclusions: A comprehensive program involving multiple agencies and team-based care, along with community interventions to support “Cook your drugs”, reduce Hydromorphone-controlled release prescribing, and institute patient outreach- led to a reduction in HIV incidence which has been sustained over 5 years.

Supporting Document



Data source: Public Health Ontario Infectious Disease Query, data extracted by Middlesex-London Health Unit on Dec 16, 2021. Data current as of Dec 15, 2021 at 7am

217 Wise Women Journeys: Streams of Knowledge and Rivers of Change, Tides of the Coast Salish Sea Bringing our Indigenous Healthcare Teachings

Valerie Nicholson[1,2], **Niloufar Aran**[1], Hazel Debbie Cardinal[1], Amber R Campbell[3,4], Sheila Nyman[5], Rebecca Gormley[1], Angela Kaida[1,4]
[1]Simon Fraser University, Burnaby, Canada, [2]British Columbia Centre for Excellence in HIV/AIDS, Vancouver, Canada, [3]Oak Tree Clinic, BC Women's Hospital and Health Centre, Vancouver, Canada, [4]Women's Health Research Institute, BC Women's Hospital and Health Centre, Vancouver, Canada, [5]Bear Rock Consulting, Clearwater, Canada

Background: The Canadian HIV Women's Sexual and Reproductive Health Cohort Study – Prioritizing the Health Needs of Positive Aboriginal Women (CHIWOS-PAW) used Indigenous re-search methods to explore how Indigenous Women living with HIV on Coast Salish Territories understand their health and wellbeing through traditional medicines and ways of knowing. We describe our process of honouring ceremony and using water teachings to reflect on our re-search findings and co-create knowledge translation tools.

Methods: Under Indigenous leadership and conducting the work in a Good Way, our team of Indigenous and non-Indigenous re-searchers and Elder hosted a December 2021 gathering with the CHIWOS-PAW participants (known as 'Wise Women'). Under the mentorship and guidance of Indigenous leaders, we shared and discussed the primary findings or streams of our re-search. We then worked together to translate the findings into teachings and create a series of educational posters for healthcare settings serving Indigenous Women living with HIV.

Results: The Wise Women shared many reflections on the research findings, emphasizing that they know what is needed to achieve their healing and wellbeing. As our Elder shared: "my body knows a thing or two about a thing or two about my body." Teachings from the Wise Women included (1) understanding that health and wellbeing is a journey, not only a destination; (2) developing meaningful care relationships and partnerships is foundational to healing and health; (3) integrating traditional ways of knowing, including honouring culture and traditional medicines is essential; and (4) health and wellbeing is connected with nature. These messages were collaboratively incorporated into a visual poster series integrating water teachings and imagery.

Conclusion: Honouring ceremony and cultural humility, we co-created posters to translate research knowledge by, with, and for Indigenous Women living with HIV, that share how the Wise Women would love to vision their health and wellbeing.

219 Lymphogranuloma venereum in British Columbia: Changing epidemiology in the post-PrEP era

Amit Gupta[1,2], Barbra Arnold[1], Derek Chang[1], Mark Gilbert[1,3], Linda Hoang[1], Sylvia Makaroff[1], Sarah Malleson[1], Carolyn Montgomery[1], Venessa Ryan[1], Alberto Severini[4,5], Rochelle Stimpson[1], Vincent Valdrez[1], Jason Wong[1,3], Troy Grennan[1,6]
[1]BC Centre For Disease Control, Vancouver, Canada, [2]Faculty of Pharmaceutical Sciences, University of British Columbia, Vancouver, Canada, [3]School of Population and Public Health, University of British Columbia, Vancouver, Canada, [4]National Microbiology Laboratory, Public Health Agency of Canada, Winnipeg, Canada, [5]Department of Medical Microbiology, University of Manitoba, Winnipeg, Winnipeg, Canada, [6]University of British Columbia, Faculty of Medicine, Division of Infectious Diseases, Vancouver, Canada

Background Lymphogranuloma venereum (LGV), caused by invasive subtypes of Chlamydia trachomatis, is a sexually transmitted infection (STI) that has been increasing in Canada. Initially, most cases were among symptomatic men who have sex with men (MSM) living with HIV. More recently, a trend towards an increasing proportion of asymptomatic LGV cases has been seen, potentially due to routine STI screening for people using HIV pre-exposure prophylaxis (PrEP) programs. Using data from 2019 – specifically, the year following the introduction of publicly-funded PrEP in BC - this study describes the epidemiology of LGV in the context of widespread PrEP availability in BC.

Methods A retrospective chart review of all LGV cases diagnosed in BC from 01/2019-12/2019 was performed. We collected sociodemographic information, clinical LGV information and previous STI diagnosis history. Binomial logistic regression was completed to compare the clinical presentation of PrEP users and non-users.

Results among the 119 cases, 115 were among MSM (96.6%, 115/119) and 2 were among transgender women (1.7%, 2/119), with a mean age of 38.0 years. Eighty cases occurred in HIV-negative individuals (67.2%, 80/119) and the majority were using PrEP (66.3%, 53/80). Among PrEP users, most were asymptomatic (52.8% 28/53) with a mean HIRI-MSM score of 25.4 at the time of PrEP initiation. HIV-negative individuals on PrEP were more likely to present with asymptomatic LGV compared to HIV-negative individuals not on PrEP (OR 3.56; 95% CI 1.26 - 10.9). Nearly half of individuals had previously or concurrently tested positive for syphilis (48.7%, 58/119).

Conclusion BC has seen shifts in the epidemiology of LGV, with a majority of cases being seen in asymptomatic HIV-negative men on PrEP. Our findings support the importance of routine testing combined with reflex LGV testing for chlamydia-positive rectal specimens to ensure the appropriate treatment and prevention of onward transmission.

223 Improvements in ART Initiation Over Time After Diagnosis Among Indigenous People Living with HIV in British Columbia, Canada

Nicole Dawydiuk[1], Tian Shen[1], Kate Salters[1,2], David Moore[1,3], Clara Tam[1], Tatiana Pakhomova[1], Sean Grieve[1], Valerie Nicholson[1], Claudette Cardinal[1], Sherri Pooyak[4], Tim Wesseling[1], Robert Hogg[1,2], Rolando Barrios[1,5]
[1]B.C. Centre for Excellence In HIV/AIDS, Vancouver, Canada, [2]Faculty of Health Sciences, Simon Fraser University, Burnaby, Canada, [3]Department of Medicine, Division of Infectious Diseases, University of British Columbia, Vancouver, Canada, [4]Canadian Aboriginal AIDS Network, Vancouver, Canada, [5]Vancouver Coastal Health, Vancouver, Canada

Background: Modern antiretroviral therapy (ART) has significantly reduced morbidity and mortality among people living with HIV (PLWH). With recognition of the historical and ongoing impacts of colonization in Canada, Indigenous PLWH (IPLWH) face additional challenges which may impede their access to and initiation of ART. We designed a study to examine changes in time to ART initiation among IPLWH in British Columbia (BC).

Methods: We used data from the STOP HIV/AIDS Program Evaluation (SHAPE) study and the BC HIV Drug Treatment Program (DTP) to examine factors associated with ART initiation among IPLWH. Analysis was limited to self-identified IPLWH in the SHAPE cohort who started ART in BC. We examined sociodemographic variables and measures of homelessness, substance use and mental health, and classified participants based on their year of HIV diagnosis. We conducted univariable and multivariable linear regression to model time-to-ART initiation.

Results: Between January 2016-September 2018, we enrolled 644 PLWH in SHAPE, of whom, 138 (21%) self-identified as Indigenous. Overall, 54 met inclusion criteria for this analysis; 48% were female and 52% were diagnosed between the years 2000-2009. In univariable analyses, having a mental health diagnosis (Beta: 31.3, 95% CI= 4.5, 55.6) was associated with increased time to ART initiation. However, this association was not retained in the multivariable model, where only HIV diagnosis between 2000-2009 (Beta: -43.1; 95% CI= -69.2, -16.9), and 2010 or later (Beta: -86.3; 95% CI= -124.3, -48.3) were associated with a reduced time-to-ART initiation, compared to being diagnosed prior to the year 2000. We did not find any associations with gender, age, health authority, sexual orientation, education or history of drug use.

Conclusion: Despite the socio-structural challenges faced by Indigenous PLWH, we found significant reductions in the time between diagnosis to ART initiation over time, emphasizing the improvements made in ART availability.

256 Supporting Rural and Remote Areas: An Indigenous community-led HIV care model and their associated HIV cascade of care outcomes, Saskatchewan, Canada, 2018-2020

Stephanie Konrad[1], Mamata Pandey[3], Yuping Zhan[4], Maria Folk[2], Britin Mason[2], Cara Spence[4,5], Dharma Teja Yalamanchili[2], Marina Klein[5], Stuart Skinner[2]
[1]Indigenous Services Canada, Regina, Canada, [2]Wellness Wheel, Regina, Canada, [3]Saskatchewan Health Authority, Regina, Canada, [4]University of Saskatchewan, Saskatoon, Canada, [5]McGill Unversity, Montreal, Canada

Introduction: Saskatchewan has had the highest incidence of HIV nationally for over a decade. The burden of HIV began in urban centres and spread to rural and remote areas in Saskatchewan, leading to the emergence of unique rural care models to address gaps in services delivery. With the closest urban care centre over 90km away, an Indigenous-led in-community, nurse-based case-management model with clinical guidance from an urban Infectious Disease team was developed.

Methods: Existing documentation and key stakeholders engagement were used to describe the care model. Data was extracted from an electronic medical record system for clients accessing care between 01/01/2018-12/31/2020. Demographics and clinical outcomes were described, including the proportion of active clients on treatment and virally suppressed (defined as at least one ART prescription in the calendar year and the last viral load (VL) within the calendar year <200copies/mL, respectively).

Results: The HIV care model, initiated in 2011, includes harm reduction, STBBI testing, HIV phlebotomy, peer-support, and opioid-substitution therapy in community, as well as transportation for clinic days. Out of 110 HIV clients in care between 2018-2020, 83% were HCV co-infected, 55% were males and the average age was 41.9 (SE±0.9). The proportion of clients on treatment increased (79% in 2018 to 81% in 2019 and 87% in 2020). Of those on treatment, the proportion virally suppressed decreased from 87% to 78% from 2018 to 2020, while those with a VL >200copies/mL increased from 7% to 11%. The proportion with no VL increased from 6% to 10%.

Conclusion: The indigenous community-led model resulted in a high proportion of patients receiving ART with good levels of virologic suppression, highlighting the benefits of culturally responsive, safe and accessible rural HIV care. However, breaks in follow-up and lab testing as a result of COVID may have had impacts on maintaining viral suppression.

269 Responding to community needs during COVID-19: Facilitators, barriers and effectiveness in using the CHAMPs online intervention to reduce HIV stigma and promote empowerment

Josephine Pui-Hing Wong[1], Alan Tai-Wai Li[2,3], Solomon Lome[3], Kishor Prabakaran[3,4], CHAMPs-In-Action Alliance Team[4]
[1]Ryerson University, Toronto, Canada, [2]Regent Park Community Health Centre, Toronto, Canada, [3]Committee for Accessible AIDS Treatment, Toronto, Canada, [4]CHAMPs-In-Action Alliance, Toronto, Canada

Background: Mental health distress, social isolation, and coping challenges are the psychosocial sequelae of the COVID-19 pandemic. Racialized people living with HIV (PLHIV) are faced with additional hardships related to stigma, racism, and inequitable access to social determinants. CHAMPs-In-Action Alliance, which is made up of five AIDS service organization in Black, Asian and Latinx communities, surveyed their service users in May 2020 and found addressing mental health distress and stigma to be the priority. In response, the Alliance drew on local resources to convert their evidence-based in-person CHAMPs intervention into online modules to meet the identified needs.

Methods: The CHAMPs online intervention consists of six weekly self-directed learning modules accompanied by a 2-hour weekly online peer-facilitated group sessions. To prepare for community readiness, 19 Alliance staff and peer facilitators participated in the online pilot and three intensive train-the-trainer sessions. To date, the Alliance has engaged 75 participants in five cohorts of the CHAMPs intervention. Data collection includes socio-demographic questionnaires, pre-, immediate post-, and 3-month post- surveys of validated scales on HIV stigma, resilience and empowerment, and weekly online module responses.

Results: Preliminary data analysis of the surveys and module responses shows that the CHAMPs intervention is effective in reducing HIV stigma, promoting resilience and increasing engagement in HIV championship. Furthermore, we learned that pandemic public health rules brought both challenges and opportunities to implement community HIV programs. Compared to in-person sessions, online self-learning modules offered flexible participation in terms of scheduling and pace. However, the digital divide, a lack of private space, and the absence of in-person connection were also barriers for participation.

Conclusion: Racialized PLHIV experience increased social and health vulnerabilities during a pandemic. As Canadians continue to adjust to living the “new normal” of pandemic uncertainties, building community alliance and capacity is essential in reducing PLHIV health disparities.

272 Population Trends and Impacts of "Undetectable Equals Untransmittible" (U=U) Among Gay, Bisexual, Queer, Trans and Two-Spirit Men and Non-Binary People Across Canada, 2015-2021

Nathan Lachowsky[1,2], Alexi Hu[1], Chris Draenos[2], Ben Klassen[2], Kiffer Card[2,3], Rob Higgins[1,2], Francisco Ibáñez-Carrasco[2,4]
[1]University Of Victoria, Victoria, Canada, [2]Community Based Research Centre, Vancouver, Canada, [3]Simon Fraser University, Burnaby, Canada, [4]University of Toronto, Toronto, Canada

Background: We sought to evaluate the population-level trends of the "Undetectable equals Untransmittible" (U=U) campaign among gay, bisexual, trans, Two-Spirit, and queer men and non-binary people (GBT2Q) across Canada, especially the impacts among GBT2Q living with HIV.

Methods: Data are from community-based repeated cross-sectional bilingual (English/French) surveys: 2015 (online), 2018 (pride festivals), 2019 (online), 2020 (online), and 2021 (online). Online recruitment used paid sociosexual websites/apps advertisements and community-based organizations' social media and email lists. Eligible participants were at least 15 years old, lived in Canada, and either identified as non-heterosexual or reported sex with a man in the past 5 years. Women were ineligible. Temporal trends were evaluated using multivariate logistic regressions, with survey year (continuous) as the primary explanatory variable, controlling for age, education, ethnoracial identity, geography, gender identity, transgender status, and HIV status. Adjusted odds ratios (AOR) and 95% confidence intervals (95%CI) are shown.

Results: The pooled sample included 23,460 responses. Knowledge that HIV medications effectively suppress one's viral load increased from 69.6% in 2015 to 87.8% in 2021 (AOR=1.31, 95%CI: 1.12-1.54). Knowledge of the U=U scientific consensus increased from 71.7% in 2018 to 82.4% in 2021 (AOR=1.28, 95%CI:1.11-1.48). However, the practice of viral load sorting (condomless sex only with an undetectable partner) did not change over time: 3.7% in 2015 to 7.6% in 2021 (AOR=1.18, 95%CI: 0.86-1.63). When participants living with HIV were asked about U=U impacts, a third reported decreased shame (39.8%), stigma (37.9%), and rejection by sexual partners (28.5%); one in five reported increased pressure to take medications (17.1%); and a third reported increased mental well-being (32.9%), quality of sex life (30.8%), and social well-being (28.1%).

Conclusions: While U=U knowledge has increased over time among GBT2Q, behavioural uptake and self-reported impacts remain incommensurate. Future research and interventions should interrogate and address this gap.

280 Constrained Choices and HIV Risk for Queer African Refugees in the Canadian Refugee Determination Process

Notisha Massaquoi[1]
[1]*University Of Toronto, Scarborough, Toronto, Canada*

Background: Refugee claims based on sexual orientation and gender identity persecution make up 12% of the refugee cases in Canada, with queer African refugees constituting the most significant group within this category. Refugees are noted as being at a higher risk for HIV infection post-migration due to several compounding factors, including complex settlement challenges, pre-and post-migration trauma, limited employment opportunities, poverty, challenges accessing services, stigma, and racism. The refugee process inevitably increases stress levels, which reduces health prevention and health-seeking tendencies.

Method: Through the framework of queer phenomenology, qualitative in-depth interviews were conducted with 40 queer African refugee claimants navigating the Canadian refugee determination process. Study participants self-identified as male (20), female (16), transmen (2), and as transwomen (2). They arrived from 11 African countries of origin.

Results: While increased risk did not guarantee HIV infection, study findings noted that participants were forced to live precarious lives upon arrival in Canada and were in vulnerable positions due to lack of power in sexual negotiations, cultural differences in communication styles, the stigma associated with HIV and refugee status, and preoccupation with daily survival that did not lend itself to attention to healthcare needs.

Conclusion: A new model of HIV risk for queer African refugees has been created based on the social determinants of health, anti-Black racism, and Canadian homonational narratives of who deserves protection behind Canadian borders. This model highlights how HIV risk is elevated for queer African refugees during the refugee determination process not only due to the social determinants of health but also increased through the forced queer performance required in the Canadian refugee process as well as the forced heterosexual performance required in the countries of origin prior to migration. These factors constrained sexual health and HIV prevention choices, facilitating increased HIV risk for research participants.

301 Correlates of genital immune cell frequencies in South African women and the risk of HIV infection: a prospective cohort analysis

Lenine Liebenberg[2,3], Jo-Ann S. Passmore[2,4], Farzana Osman[2], Janine Jewanraj[2,3], Andile Mtshali[2,3], Derseree Archary[2,3], Sinaye Ngcapu[2,3], Aida Sivro[1,2,3], Leila E. Mansoor[2,3], Quarraisha Abdool Karim[2,3,5], Salim S. Abdool Karim[2,3,5], Lyle McKinnon[1,2,3]
[1]University Of Manitoba, Winnipeg, Canada, [2]CAPRISA, Durban, South Africa, [3]University of KwaZulu-Natal, Durban, South Africa, [4]University of Cape Town, Cape Town, South Africa, [5]Columbia University, New York, United States of America

Background: Genital inflammation (GI) defined by cytokines has been associated with increased HIV risk in women, with potential mechanisms that include increased density of HIV target cells and a more porous mucosal barrier. However, most genital target cell studies have been small and cross-sectional, and the factors that influence target cell density and predict HIV outcomes are poorly described.

Methods: We enrolled and prospectively followed 181 HIV-negative women, a subset of participants in the CAPRISA 008 study in KwaZulu-Natal, South Africa, with genital tract sampling at 824 biannual clinic visits. T cell phenotyping and enumeration was performed on endocervical cytobrushes using flow cytometry, and cytokines and barrier-associated matrix metalloproteinases (MMPs) quantified in cervicovaginal lavage. Associations between immune variables were measured using linear mixed models, and between immune variables and HIV acquisition using time-varying Cox regression; both were adjusted for potential confounders.

Results: Inflammatory cytokines and MMPs were associated with the abundance of activated endocervical HIV target cells; target cells were increased in particular at visits when GI was present. While GI was the strongest predictor of target cell abundance (adjusted beta=0.26, 95%: 0.10-0.42), target cells were increased in women with STIs and recent condomless sex and trended to decrease in women with Nugent-BV. A total of 24 women acquired HIV infection during follow-up. While genital CD4+ T cell abundance was not associated with HIV, the abundance of CD8+ T cells expressing HLA-DR was inversely associated with an 80% decreased risk of HIV acquisition in adjusted models (aHR=0.20, 95% CI: 0.05-0.79).

Conclusions: Genital inflammation and MMPs were associated with increased abundance of HIV target cells in the endocervix, in models adjusted for multiple covariates. However, endocervical CD4+ T cell abundance was not associated with HIV acquisition. Further studies of a protective role for HLA-DR+ CD8+ T cells should be further investigated.

318 Beyond my scope: Providing hospital-based healthcare services for people living with HIV who use drugs

Bill O'Leary[1], David J. Brennan[2], Rachelle Ashcroft[2], Soo Chan Carusone[3], Adrian Guta[4], Carol Strike[2]
[1]Wilfrid Laurier University, Toronto, Canada, [2]University of Toronto, Toronto, Canada, [3]McMaster University, Hamilton, Canada, [4]University of Windsor, Windsor, Canada

Background: People living with HIV (PLWH) who use drugs are hospitalized at higher rates than the general population and report receiving poor care. There is little discussion in the research literature that articulates how "knowledge" of healthcare providers is applied to the delivery of care for this population. Objective: Apply structuration theory to examine the perspective and actions of healthcare providers that create and re-create the structures (i.e., rules and practices) a patient is continually responding to or resisting. These factors positively and negatively influence the hospital admission of PLWH who use drugs.

Methods: Semi-structured interviews were conducted with healthcare providers on in-patient hospital units in Toronto and Ottawa, Canada. Interviews were audio-recorded and transcribed verbatim. Structuration theory was used to guide thematic analysis. Results: Twenty-six healthcare providers participated (physicians, nurses, dietician, pharmacists, and social workers). Core to the healthcare providers' practical knowledge, knowledge articulated in acts and not always discursively expressed, are providers' beliefs and professional lived-experience; practical knowledge often informs what healthcare providers believed was an objective understanding of the medical needs and life experience of PLWH who use drugs and also the implicit rules that were applied in their practice. Experience, specifically the professional lived-experience of interacting with patients who use drugs, was acknowledged as directing their clinical practice and decision making when delivering care to PLWH who use drugs. At times, this professional lived-experience-informed understanding superseded research findings or evidence within the relevant literature.

Conclusion: The practical knowledge of healthcare providers often guides delivery of healthcare for PLWH who use drugs. Engaging in reflexive monitoring (e.g., taking part in a research interview) can shift practical knowledge to the discursive level. Analysis of discursive knowledge produces opportunities to influence the actions of healthcare providers, thereby impacting the hospital admission experience of PLWH who used drugs.

320 I’m Ready Program 6-Month Results: African, Caribbean and Black participants accessing HIV self-testing across Canada

Wangari Tharao[2], Maureen Owino[2], Muna Aden[2], Lena Soje[2], Samentia Keen[2], Denese Frans[2], Kaminda Musumbulwa[1], Richard Galli[1], Sean Rourke[1], I'm Ready Study Team[1]
[1]REACH Nexus, Toronto, Canada, [2]Women's Health in Women's Hands, Toronto, Canada

African, Caribbean and Black (ACB) communities continue to be disproportionately affected by HIV in Canada. Experiences of multiple dimensions of stigma and discrimination, compounded by the COVID-19 pandemic, have exacerbated this impact by reducing access to testing facilities and interrupting linkage to care. To facilitate increased uptake of testing, Women’s Health in Women’s Hands co-built with REACH Nexus and CBRC, the I’m Ready program to offer access to free HIV self-tests, HIV care pathways, with virtual support by trained peer navigators (www.readytoknow.ca).

Eligible participants were aged 18 or older and lived in Canada. Through the I'm Ready, Test mobile app, participants consent, create an anonymous profile, answer pre- and post-test surveys, order up to 3 free HIV self-tests for delivery or pick-up at 80 community sites across Canada, take the test, and upload results. Participants have opportunities to connect with peer navigator support before, during or after testing through the integrated I'm Ready, Talk telehealth platform. Participants could use self-tests for themselves and others.

In the first 6 months, 255 ACB people from across Canada participated: 49% were under 30 years of age; 42% identified as women, 53% as men, and 4% as gender diverse (Trans, non-binary, genderqueer); 54% identified as heterosexual and 44% as LBTQ+; 61% reported being born outside of Canada; overall health was “good” (36%), “very good” (26%) and “excellent” (17%); 20% reported symptoms of depression. Regarding access to care, 52% indicated that the COVID-19 pandemic negatively impacted access to HIV testing; 22% were first-time testers. Only 2% reported current PrEP use. Regarding sexual health, 31% disclosed prior STI diagnosis; 58% disclosed having condomless anal or vaginal sex in the last 3 months.

Opportunities remain to reach subsets underrepresented in this initial sample. This includes refugees and non-status individuals, gender diverse, and ACB communities in Western Canada.

322 “We’re able to start addressing untreated HIV and HCV” – How healthcare providers affiliated with safer opioid supply programs describe the implications for harm reduction and HIV/HCV care

Adrian Guta[1], Rose Shmidt[2], Natali Kaminski[2], David Kryszajtys[2], Katherine Rudzinski[1], Melissa Perri[2], Carol Strike[2]
[1]School of Social Work, University of Windsor, Windsor, Canada, [2]Dalla Lana School of Public Health, University of Toronto, Toronto, Canada

Background: The opioid overdose crisis continues to claim 1000s of lives each year in Canada. Safer supply programs (SSPs) provide individuals who use illicit opioids with an 'off label' prescription for pharmaceutical grade options. These innovative programs are being piloted across Canada. We examined SSPs delivered in urban community health centres using a primary care model.

Methods: We conducted semi-structured interviews with purposively recruited health and human service providers working in, and providing complementary services to, four SSPs in Ontario, from February to October 2021. Interviews examined SSPs implementation, challenges, and impact. Participants also completed a short questionnaire with demographic, training, and employment history information. Thematic analysis was conducted in MAXQDA and descriptive statistics in SPSSv28.

Results: We interviewed n=27 participants (physicians, nurses, community health workers, pharmacists). The programs prioritized clients refractory to opioid agonist treatment, living with unmanaged HIV/HCV, homeless, and palliative, and at disproportionate risk of fatal overdose. Participants described SSPs as a tool to engage some of the most marginalized people who use drugs. The primary care model enabled non-infectious disease experts to engage clients through a safer and reliable source of opioids and to build trust towards initiating HIV and/or HCV testing and treatment, and keep them engaged in care to achieve viral suppression and/or clearance, address longstanding health and mental health issues, and facilitate access to social supports (e.g., housing). However, providers struggled to keep up with the demand for enrolment, had limited options to offset ongoing illicit fentanyl use, and faced complex ethical decisions related to intake, dosage, and discharge. While beneficial, the primary care model limits program reach and creates conditions of burnout for prescribers.

Conclusions: SSPs are a promising component of the HIV/HCV continuum of care. However, our results indicate a need to expand access and pursue additional clinical and policy options.

Social Sciences Oral Abstracts / Sciences sociales eposés oraux

39 Les homosexuels face au VIH/sida au Québec: socio-histoire d'une mobilisation intersectorielle

Mariane Fournier[1]
[1]*Université De Montréal, Montréal, Canada*

Objectifs: Au Québec, l'histoire des premières années de la lutte contre le VIH/sida a peu été étudiée, y compris chez la population la plus touchée : les gais. Le projet de recherche sur lequel s'appuie cette présentation documente cette histoire à partir de la perspective de ses principaux acteurs, en s'interrogeant notamment sur un potentiel « retard ».

Méthodologie: Cette étude qualitative s'appuie sur une démarche socio-historique, d'où le recours à des sources documentaires, archivistiques et orales. En plus d'une revue de la littérature, des fonds des Archives gaies du Québec ont été examinés et des entrevues semi-dirigées ont été menées.

Résultats: La situation du Québec présente des points communs avec d'autres contextes, comme la mobilisation première de professionnels de la santé et de groupes communautaires. Notre recherche permet cependant de faire ressortir certaines particularités. D'abord, la mobilisation contre le sida au Québec s'inscrit dans un contexte sociopolitique de tensions avec le fédéral. Comme les deux paliers de gouvernement devaient collaborer dans la gestion de l'épidémie, ces tensions ont retardé la définition des politiques publiques. Ensuite, les communautés francophone et anglophone du Québec présentent des différences culturelles, avec des conceptions et des approches spécifiques. Ces divergences ont mené à la création de réseaux communautaires parallèles. Finalement, la reconnaissance de l'homosexualité est encore timide dans la société québécoise au moment où émerge l'épidémie. Cela a nui à la prévention chez les gais, en plus d'affecter les collaborations entre militants sida et groupes homosexuels.

Conclusion: Il est important de s'intéresser à la réponse au VIH/sida au Québec, car ce contexte jette un nouvel éclairage sur la notion de « retard » dans la lutte contre le VIH/sida, qui s'explique au Québec par des éléments spécifiques : tensions entre provincial et fédéral, divergences entre anglophones et francophones et reconnaissance timide de l'homosexualité.

47 Barriers and Facilitators to accessing HIV Health Services Among 2SLGBTQ+ Street-Involved Youth in Canada

Alex Abramovich[1,2,3], Katie MacEntee[2], Edward Ou Jin Lee[4], Paula Braitstein
[1]Institute for Mental Health Policy Research, Centre for Addiction and Mental Health (CAMH), Toronto, Canada, [2]Dalla Lana School of Public Health, University of Toronto, Toronto, Canada, [3]Department of Psychiatry, University of Toronto, Toronto, Canada, [4]School of Social Work, Université de Montréal, Montreal, Canada

Background: 2-Spirit, lesbian, gay, bisexual, transgender, queer, and questioning (2SLGBTQ+) youth are overrepresented among youth experiencing homelessness and constitute 20-40% of the homeless youth population. Street-involved youth (SIY), particularly 2SLGBTQ+ youth, are at greater risk of contracting HIV, sexually transmitted infections, and blood-borne infections, due to a variety of factors such as, age, socioeconomic status, housing status, and barriers accessing healthcare services. Unstably housed youth are 2-10 times more likely to contract HIV than their stably housed peers. This study focuses on adapting and scaling-up Peer Navigators (PN) to increase uptake and utilization of HIV care among SIY. We present findings on the unique barriers and facilitators to HIV health services among 2SLGBTQ+ SIY in Toronto and Montreal.

Methods: Utilizing an integrated mixed-methods approach, participants included 2SLGBTQ+ SIY, aged 16-29, healthcare providers, and community stakeholders in Toronto and Montreal. Semi-structured interviews, focus groups, and Theatre Testing workshops were conducted. Interviews and focus groups focused on the barriers and facilitators to accessing HIV health services. Data were analyzed using an iterative thematic content analysis approach.

Results: The main barriers to accessing HIV health services identified among 2SLGBTQ+ SIY included: inadequate 2SLGBTQ+ specialized services; lack of basic needs; and stigma. Participants reported systemic barriers, including widespread discrimination and stigma, and challenges accessing institutional settings, such as healthcare services. Facilitators to HIV health services were also identified and included: supportive relationships with friends and family and healthcare providers; accessible healthcare facilities; and 2SLGBTQ+ inclusive healthcare.

Conclusions: Although little is known about how to remove the extensive barriers to accessing HIV care experienced by 2SLGBTQ+ SIY, there are various types of interventions that show promise at targeting HIV risk behaviours and access to care among SIY, including PN interventions and inclusive and affirming population-based health services that target the needs of 2SLGBTQ+ SIY.

59 The stigma index of people living with HIV (PLHIV) in Quebec: Institutional stigma: reluctance to seek HIV care after diagnosis

Sylvain Beaudry[1], Joanne Otis, Ken Monteith, Maria Nengeh Mensah, Charlotte Guerlotté, Sylvain Laflamme, Hugo Bissonnet, Chris Lau, Maryse Laroche, Joseph Jean-Gilles, Zack Marshall, Marilou Gagnon, Christine Vézina, David Lessard, Oscar Labra, Edward Lee
[1]*COCQ-SIDA, Montréal, Canada*

Background: Stigma continues to be a major stressor in the lives of PHAs. To better understand the social determinants of HIV-related stigma in Quebec, an intersectoral team conducted the PHA Stigma Index.
Methodology: In 2019, a questionnaire was administered face-to-face to 281 PHAs. These interviews were conducted by 9 peer research associates, in 8 regions of Quebec. The questionnaire explored different types of stigmas: institutional, effective, perceived, internalized, and intersectional.

Results: The mean score on the scale of reluctance to seek HIV care after diagnosis was relatively low, at 2.51 on a scale ranging from 1 to 9. A higher mean score on this scale was observed among those who reported speaking a language other than French, the presence of depressive symptoms, a HIGHER mean score on the scales of current internalized and anticipated stigma, lifetime institutional stigma, and discrimination experienced in HIV care in the past 12 months, and a LOWER mean score on the scales of social support received. Multivariate analysis indicated that a higher mean score on the reluctance to seek HIV care scale after diagnosis was associated with having a higher score on the anticipated stigma (ß: 0.46), internalized stigma (ß: 0.27), and discrimination experienced in HIV care in the past 12 months (ß: 0.37) scales (R2: 21.2%).

Conclusion: The sources of experienced stigma are numerous. The institutional stigma experienced throughout life, which may explain the delay in seeking care, seems to be reflected in the anticipated and internalized stigma experienced at the time of the survey. This underscores the importance for the health care professional to be sensitive to the initial encounters following a diagnosis. Increased institutional stigma may also reflect a lack of sensitivity on the part of health care professionals to intersectional issues that subsequently sustain internalized and anticipated stigma among PHAs.

65 “I did not have sex outside of our bubble”: Risk Reduction Strategies and Changes in Sexual Practices among Gay, Bisexual, and Queer men in Canada during the COVID-19 Pandemic

Emerich Daroya[1], Shayna Skakoon-Sparling[2], Cornel Grey[1], David Lessard[3], Ben Klassen[4], Jody Jollimore[4], Nathan J. Lachowsky[5], David Moore[6], Jordan Sang[6], Gilles Lambert[7], Trevor A. Hart[1,2], Joseph Cox[3], Darrel H.S. Tan[1,8], Daniel Grace[1]
[1]University Of Toronto, Toronto, Canada, [2]Ryerson University, Toronto, Canada, [3]McGill University, Montreal, Canada, [4]Community-Based Research Centre, Vancouver, Canada, [5]University of Victoria, Victoria, Canada, [6]BC Centre for Excellence in HIV/AIDS, Vancouver, Canada, [7]Ministry of Health and Social Services of Quebec, Montreal, Canada, [8] St. Michaels Hospital, Toronto, Canada

Background: COVID-19 has impacted sexual relationships and activities between gay, bisexual, queer, and other men who have sex with men (GBM) across Canada. Our objective was to explore how GBM actively consumed and evaluated both HIV and COVID-19 medical knowledge and technologies to reduce HIV and COVID-19 transmission when engaging in sexual behaviours during the COVID-19 pandemic.

Methods: Semi-structured interviews were conducted with 93 GBM as part of Engage-COVID-19: a mixed-methods study examining the impacts of COVID-19 on GBM living in Vancouver, Toronto, and Montreal. Two rounds of online interviews took place between November 2020-January 2021 and June-October 2021. Interviews were transcribed verbatim and thematically coded using NVivo. We evaluated how GBM adapted and interpreted medical knowledge, public health measures, and biomedical technologies related to HIV and COVID-19 when forging sexual safety practices during the COVID-19 pandemic.

Results: Participants ranged in age from 24-64 years old. Our analysis produced four key themes. First, some participants reported creating “sex bubbles” with trusted and already known sex partners to ensure safety from COVID-19, HIV, and other sexually transmitted infections (STIs). Second, a few men have used masks to avoid physical contact and engaged in “socially distant” sex, such as voyeuristic masturbation. Third, several participants asked potential partners about their HIV, STI, and COVID-19 infection status, as well as COVID-19-related preventive behaviours, to assess their safety profile. Fourth, most participants reported increased sexual activities following double vaccinations and employed “vaccine sorting” as a safety precaution.

Conclusion: Our results demonstrate how GBM have actively evaluated, consumed, and adapted HIV and COVID-19 public health messaging to create preventive measures and reduce sexual risks during the COVID-19 pandemic. Future research should focus on how GBM manage numerous epidemics in creative ways to sustain safer sex and continue sexual behaviours in a constantly shifting COVID-19 context.

94 Meaningful Research Methods in Indigenous STBBI Research

Randy Jackson[1,2], **Aaron Li[1,2]**
[1]The Feast Centre for Indigenous STBBI Research, Scarborough, Canada, [2]McMaster University, Hamilton, Canada

Aim/Objective: Indigenous scholars, community leaders, and allies have imagined and constructed approaches to health research to inspire positive transformational change. Bringing Indigenous perspectives to research methods is one way of meaningfully involving Indigenous peoples in STBBI research across the four pillars of health research (basic, clinical, epidemiological, and social sciences). The goal of this rapid review was to examine how Indigenous knowledges have informed the creation of research methods, identify how Indigenous knowledges can assist to decolonize research, and observe how Indigenous knowledges and epistemologies construct research paradigms and teach beneficial ways to do research with Indigenous peoples.

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, an exclusive focus on STBBI, and contained a discussion or description of how Indigenous perspectives have transformed the data collection process. Excerpts 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 150 articles in the final analysis which were coded to identify common themes. Central themes included: (1) collaboratively building cultural safety; (2) engaging and involving community; (3) and integrating different elements of Indigenous epistemologies in the research design.

Implications/Discussion: Supported by the Feast Centre for Indigenous STBBI research, we are especially in how research methods change within an Indigenous and decolonizing perspective across the four pillars of health. Given the diverse populations of Indigenous peoples living in Canada, no standardized framework can be provided. However, common practices and translations of Indigenous worldviews have been compiled. The findings of this research will be used to support various projects funded by the Feast Centre.

168 Syndemic Factors and Bidirectional Intimate Partner Violence among Sexual Minority Men in Canada

Allison Kirschbaum[1], Nick Metheny[2], Aaron Palachi[1], Herak Apelian[3], Joseph Cox[3], Daniel Grace[4], Jody Jollimore[5], Nathan Lachowsky[6], Gilles Lambert[7], David Moore[8], Syed Noor[9], Patricia O'Campo[10], Jordan Sang[8], Shayna Skakoon-Sparling[1], Alexa Yakubovich[11], Trevor Hart[1]
[1]Ryerson University, Toronto, Canada, [2]University of Miami, Miami, United States, [3]McGill University, Montreal, Canada, [4]University of Toronto, Toronto, Canada, [5]Community-Based Research Centre, Vancouver, Canada, [6]University of Victoria, Victoria, Canada, [7]Ministry of Health and Social Services of Quebec, Montreal, Canada, [8]BC Centre for Excellence in HIV/AIDS, Vancouver, Canada, [9]Louisiana State University Shreveport, Shreveport, United States, [10]St. Michael's Hospital, Toronto, Canada, [11]Dalhousie University, Halifax, Canada

Background: Intimate partner violence (IPV) is associated with HIV risk among sexual minority men (SMM). Bidirectional (IPV), reporting both IPV victimization and perpetration, may further increase HIV risk. Syndemic theory suggests a constellation of risk factors compound IPV risk, but common approaches to syndemic analysis are unable to precisely inform IPV-related HIV interventions. This analysis examined associations between four syndemic factors (alcohol misuse, illegal drug use, childhood sexual assault [CSA], depressive symptomatology) and bidirectional IPV among SMM in three Canadian urban areas using novel analysis methods.

Method: Using baseline data from the Engage Cohort Study (N=2,449), we fit three logistic regression models with lifetime exposure to bidirectional IPV as the outcome and controlling for demographic factors. Model 1 examined syndemic factors individually, Model 2 employed a summative scale of syndemic exposure (i.e., reporting 0, 1, 2, or 3-4 syndemic factors), and Model 3 used marginal analysis to examine the relative excess risk of each syndemic combination.

Results: Thirty-one percent (N=762) of respondents reported bidirectional IPV. CSA (N=954, 39%), alcohol misuse (N=1361, 55.6%), illegal drug use (N=1356, 55.4%), and depressive symptomatology (N=463, 18.9%) were significantly associated with greater odds of bidirectional IPV. A dose-response relationship was found between number of syndemic factors and bidirectional IPV (1 factor: aOR=1.63, 95%CI [1.30, 2.04], 2 factors: aOR=3.11, 95%CI [2.49, 3.88], 3-4 factors: aOR=4.17, 95%CI [3.29, 5.28]). Respondents reporting alcohol misuse, depressive symptomatology, and CSA had a 57% higher risk of reporting bidirectional IPV than those reporting zero syndemic factors (0.57, 95%CI [0.21, 0.94], p=0.002).

Conclusion: Given the close association between IPV and HIV risk, pinpointing specific factors on which to intervene is critical to ending the HIV epidemic in Canada. Nuanced analysis methods can help disentangle factors associated with IPV and HIV in SMM, potentially leading to more efficacious interventions for specific SMM communities.

169 Evaluating the Impact of the 'Undetectable Equals Untransmittable' (U=U) Campaign Message Among People Living with HIV: Insights from the Ontario HIV Stigma Index

Jasmine Cotnam[1,2], **Billy Tran**[1,3,4], James Watson[1,3], Jason M. Lo Hog Tian[1,3,4], A. McGee[1], Anthony Boni[1], Annette Fraleigh[1], George Da Silva[1], James Gough[1], Lynne Cioppa[1], Mary Mwalwanda[1], Michael Murphy[1], Monisola Ajiboye[1], Stephanie Smith[1], Wayne Bristow[1], Josephine Pui-Hing Wong[5,6], Daniel Grace[6], Sean B. Rourke[1,3,7]
[1]MAP Centre for Urban Health Solutions, Unity Health Toronto, Toronto, Canada, [2]Women's College Hospital, Toronto, Canada, [3]REACH Nexus, Toronto, Canada, [4]Institute of Medical Science, University of Toronto, Toronto, Canada, [5]Daphne Cockwell School of Nursing, Faculty of Community Services, Ryerson University, Toronto, Canada, [6]Dalla Lana School of Public Health, University of Toronto, Toronto, Canada, [7]Department of Psychiatry, University of Toronto, Toronto, Canada

Background: The global U=U campaign aims to encourage the initiation of, and support for adherence to antiretroviral therapy (ART), reduce HIV stigma, and improve access to care for all key populations. While similar studies have examined the uptake of the U=U message among different populations, few studies have done so in the Canadian context. We aimed to quantitatively investigate the impact of U=U on lived experiences with HIV, how the message impacted HIV stigma, and understanding patient-provider health communication.

Methods: The Ontario HIV Stigma Index is a community-led, cross-sectional study about the determinants, social contexts and nuanced changes in HIV stigma. Trained peer researchers administered eight U=U questions to 240 adults living with HIV from September 2018-August 2019.

Results: A majority of participants were aware of the U=U message (96%) with 42% of those obtaining this information from their primary healthcare provider (HCP). Participants with higher enacted HIV stigma (experiences of discrimination due to HIV) were less likely to believe U=U can reduce HIV stigma (OR: 0.37; 95% CI: 0.16, 0.85). Participants with higher self-efficacy were more likely to believe U=U can reduce HIV stigma (OR: 4.86; 95% CI: 1.52, 15.54) and more likely to feel positively affected by U=U (OR: 4.21; 95% CI: 1.31, 13.57). Older adults, women, and gay/bisexual individuals were less likely to feel positively affected by U=U. Older adults were less likely to have U=U discussed with them from their primary HCP. Women were less likely to believe U=U can reduce HIV stigma.

Conclusions: Participants living with HIV who are older, women, gay/bisexual, have higher enacted HIV stigma, and higher self-efficacy possess varying levels of awareness, understanding, and perceptions of U=U. These results may help inform targeted HIV stigma reduction strategies such as workshops/guidelines on how HCPs disseminate U=U and the use of social messaging platforms.

170 A quantitative examination of intersecting race, ethnicity, gender, and sexual orientation identities and their impact on HIV stigma

Teresa Bennett[1,2], Jason M. Lo Hog Tian[1,2,3], Billy Tran[1,2,3], **Abbey McFarland**[1,2,3], Lucas Penny[1,2], Kaminda Musumbulwa[1,2], Apondi Odhiambo[4], Stefan Baral[5], Sean B. Rourke[1,2,6]
[1]MAP Centre for Urban Health Solutions, Unity Health Toronto, Toronto, Canada, [2]REACH Nexus, Toronto, Canada, [3]Institute of Medical Science, University of Toronto, Toronto, Canada, [4]Dalla Lana School of Public Health, University of Toronto, Toronto, Canada, [5]Department of Epidemiology, Johns Hopkins School of Public Health, Baltimore, USA, [6]Department of Psychiatry, University of Toronto, Toronto, Canada

HIV stigma can significantly affect the health and wellbeing of people living with HIV. This is especially true for marginalized populations who continue to be disproportionately affected by HIV. While studies have examined the contexts and impacts of ethnicity, gender, and sexual orientation on HIV stigma separately, there is less known about how these factors may intersect (and potentially exacerbate) the negative impacts of HIV stigma. This study aims to quantitatively examine and visualize how intersecting identities of ethnicity, gender, and sexual orientation may impact levels of internalized, enacted, and anticipated HIV stigma.

Participants were recruited in Ontario, Alberta, and Québec (n=1115) as part of the People Living with HIV Stigma Index study in Canada. Mutually exclusive groups were created from the intersections of race and ethnicity, gender, and sexual orientation (Caucasian men who have sex with men (MSM); Caucasian non-MSM; Caucasian women; African, Caribbean, and Black (ACB) MSM; ACB non-MSM; ACB women; Indigenous MSM; Indigenous non-MSM; Indigenous women). Heatmaps were used to visualize the intersectional levels of stigma across these demographics and characteristics.

High levels of stigma were present across the whole sample, with certain key populations having higher levels of certain stigmas compared to others. For internalized stigma, many groups had similar levels, except ACB women and Indigenous non-MSM groups who had the highest scores. All MSM had relatively lower levels of enacted stigma, with ACB women having the highest. The ACB population overall had the highest levels of anticipated stigma compared to the Caucasian and Indigenous groups, with ACB women again being the highest.

These heatmaps provide a useful tool to visualize how intersecting identities and personal characteristics may play a role in experiences of various dimensions of HIV stigma. More work is needed to validate these, and to develop and advance methods to quantify intersectionality factors.

185 The Canadian Coalition to Reform HIV Criminalization: Consulting the Community on Criminal Code Reform Advocacy

India Annamanthadoo[1], Chad Clarke[2], Alexander McClelland[3], Valerie Nicholson[2], Léa Pelletier-Marcotte[4], Richard Elliott[1]
[1]HIV Legal Network, Toronto, Canada, [2]Canadian Coalition to Reform HIV Criminalization, Canada, [3]Carleton University, Ottawa, Canada, [4]COCQ-SIDA, Montréal, Canada

Objectives: In 2017, the Canadian Coalition to Reform HIV Criminalization conducted its first national consultation, leading to a Community Consensus Statement. This statement is a shared and unified critique of Canada's approach to criminalizing HIV, which is one of the most severe in the world. It makes specific demands of the federal and provincial governments to limit the criminalization of HIV. To inform the next phase of its advocacy, the Coalition launched a second community consultation in 2021.

Materials and Methods: The consultation was conducted through an online survey and virtual meetings from August 2021 to early 2022. People living with HIV, affected communities, HIV service providers, advocates, researchers and activists were consulted on three proposed legislative reform options. The survey also asked respondents whether they thought the criminal law should apply in a variety of situations and whether the Coalition should continue its advocacy efforts to reform the Criminal Code. During the virtual meetings, participants were able to share their comments and concerns. Demographic data were voluntarily collected to ensure representation.

Results: The Coalition received 211 responses to the online survey. More than 100 people participated in seven virtual meetings. The majority of respondents (88%) supported the Coalition continuing its advocacy efforts to reform the Criminal Code. Only 3% of respondents supported maintaining the status quo (i.e., not advocating for reforms). In the specific factual situations posed (e.g., undetectable viral load, condom use, oral sex, coercion or fear), the majority of respondents consistently felt that prosecution was not warranted.

Conclusion: The consultation results will inform and strengthen the Coalition’s ongoing advocacy with the federal government for legislative reform. Meaningful involvement of people living with HIV and affected by HIV is fundamental to the reform process.

Conflicts of Interest: N/A

Keywords: Criminalization; Human rights; Criminal law; Consultation; Advocacy; Community; Survey

214 Migration and Health Study: Findings from an Exploratory Qualitative Study of Sexual Health among Racialized Migrants in Manitoba, Canada

Rusty Souleymanov[1], Chinyere Njeze[1], Bolaji Akinyele-Akanbi[1], Patricia Ukoli[1], Mike Payne[2], Laurie Ringaert[3], Gayle Restall[1], Linda Larcombe[1]
[1]University Of Manitoba, Winnipeg, Canada, [2]Nine Circles Community Health Centre, Winnipeg, Canada, [3]Manitoba HIV-STBBI Collective Impact Network, Winnipeg, Canada

Background: Very little research is available on the sexual health of racialized immigrant and refugee populations in Canada. This community-based participatory study examined the sexual health of racialized migrant populations in Manitoba.

Methods: Participants (n = 34) from African, Caribbean, Black; Latin American/Latinx; South Asian; East and Southeast Asian migrant communities were recruited across Manitoba using printed flyers and through social media. Interviews with participants explored questions relating to sexual health, knowledge of HIV and other sexually transmitted and blood-borne infections (STBBI), and experiences with healthcare providers in Manitoba. Data were analyzed using thematic analysis.

Results: Four key themes emerged: (a) HIV/STBBI awareness, testing, and sexual risk practices; (b) sexual health information needs; (c) impacts of gender norms, culture, and religion on sexual health; (d) HIV stigma, social exclusion, and experiences of racism. Participants described differences in knowledge about HIV/STBBI testing. New migrants and those who were not yet linked to healthcare were more likely to reveal not having had an HIV/STBBI test in Canada, or even being aware where to get tested. The findings also show that HIV/STBBI risks were contextual; there was a spectrum of risk scenarios depending on the type of partnerships/relationships, and the type of sex individuals engaged in. Our result also highlighted the issue of access to sexual health information (in languages spoken by migrants), including the need to access this information at community-based agencies. Findings also reveal the impact of culture, religion, and gendered norms, as well as HIV stigma and racial discrimination in healthcare contexts, which negatively affected participants' engagement with sexual health services.

Conclusions: Service providers, researchers, policy makers and funders should consider the impacts of these socio-ecological factors on the development of healthcare barriers, HIV/STBBI, and negative sexual health outcomes for racialized migrant communities in Canada.

263 Beyond Blue Door: Understanding the complex challenges of precariously insured People Living with HIV in accessing health care

Alan Li[1,2], Julia Eden[1], Alessandro Bisignano[5], Irene Wanyoto[1], Mandana Vahabi[3], Seungwon Nam[1], Ower Alexander Oberto[1], Michael Wu[1], Rene Lopez[4], Tania Correa[1], Josephine Pui-Hing Wong[3]
[1]Committee For Accessible Aids Treatment, Toronto, Canada, [2]Regent Park Community Health Centre, Toronto, Canada, [3]Ryerson University, Toronto, Canada, [4]Centre for Spanish Speaking Peoples, Toronto, Canada, [5]Casey House, Canada

Background: Access to care and treatment is a structural driver of the HIV epidemic at the individual and population levels. Uninsured and precariously insured people living with HIV (UPI-PLHIV) experience complex challenges and significant gaps in care, resulting in health disparities and barriers to curbing the epidemic.

Methods: Beyond Blue Door is a community-based participation study with mixed method design guided by a socioecological and population health promotion framework. The study aims to understand the service gaps, experiences, and needs of UPI-PLHIV; and to identify policy and practice changes to improve their linkage and retention to care. Using online focus groups and individual interviews, we engaged 30 UPI-PLHIV and 20 service providers working with UPI-PLHIV.

Results: UPI-PLHIV represent a diverse group with intersecting social identities and immigration statuses in Canada, including migrant workers, students, visitors and newcomers with pending statuses. They are racialized and sexual minority people who have experienced trauma and discriminations both in their pre-migration countries and in Canada and face complex barriers in accessing many social determinants. Key access challenges to healthcare include: stigma, fear and distrust of health providers; lack of clear information on services and navigation pathways; language barriers; precarious employment and housing; gaps in healthcare coverage; and lack of health care providers willing to serve UPI-PLHIV. Service reduction and delayed immigration processing due to the COVID-19 Pandemic further compounded the hardship faced by this vulnerable population.

Conclusion: To address the health inequities faced by UPI-PLHIV, both community-based interventions and systemic change are required. Community level strategies include: culturally and linguistically inclusive programs to support service navigation, linkage to HIV care and mental health support; and a centralized mechanism to coordinate treatment access. Systemically, universal access to treatment and healthcare coverage for all residents are critically needed to reduce health disparities and advance population health.

281 Gay and Bisexual Middle Eastern and North African (MENA) Diaspora Youth Navigating Sex, Desire and Health in Ontario, Canada: Findings from the YSMENA Study

Roula Hawa[1,2], Vijaya Chikermane[3], Olesya Falenchuk[4], Bessma Momani[5], Ahmad Ezzeddine[6], Anmar Al-Azzawi[7], Moe Akel[8], Rama Eloulabi[9], Tina Pahlevan[10], Lina Hammad[11], Mazen El-Baba[12], Mona Loutfy[13]
[1]Brescia University College at Western, London, Canada, [2]Ontario HIV Treatment Network, Toronto, Canada, [3]7.10 Stories, [4]Ontario Institute for Studies in Education, University of Toronto, [5]University of Waterloo, [6]YSMENA Study, [7]Capital Rainbow Refuge, [8]Alliance for South Asian AIDS Prevention, [9]Western University, [10]Peel Public Health, [11]YSMENA Study, [12]University of Toronto ,[13]Women's College Hospital, University of Toronto

Introduction: Sex and sexual health practices of Middle Eastern and North African (MENA) youth in Canada are under-researched and require attention as the community continues to grow due to immigration. Gay and bisexual cis men who have sex with men (MSM) have been significantly immigrating to Ontario and identified as a key population. The YSMENA community-based research study aimed to understand barriers and resiliencies relating to sexual health access among MENA youth living in Ontario.

Method: The study employed mixed-method data collection through a quantitative socio-demographic survey and qualitative focus groups engaging 56 MENA youth between 16-29 years in Ontario. Fifteen (15) sequential critical dialogical focus groups were held with youth sub-groups across the sexual and gender spectrum. Six focus groups were conducted with 22 gay and MSM youth representing the largest participant sample of the study. Focus group sessions were transcribed and coded using NVIVO to determine thematic patterns.

Results: Average age of the men was 26.9 years old (SD=2.59) and the majority spent less than nine years in Canada. The youth discussed dealing with systemic oppressions when accessing health care or employment, homophobia from cultural communities, strained familial relationships, while also grappling with fetishization and pressures to conform in mainstream gay spaces. The need for a sense of belonging, low self-esteem and lack of community connection were identified as factors contributing to condomless sex. While culturally relevant resources were lacking, many talked about journeys to self-acceptance and of building peer networks. Participants discussed strategies to strengthen their access to sexual health, especially PrEP, testing, and media-based educational interventions.

Conclusion: MENA gay and MSM youth experiences of migration layered with their sexual identities surfaced unique challenges and strengths. Participant recommendations of culturally relevant services, peer support and/or PrEP access have important implications for policy, programming and continued research.

287 HIV Prevention and Sexual Health Interventions Recommended by Middle Eastern and North African (MENA) Diaspora Youth in Ontario, Canada: The YSMENA Study

Roula Hawa[1,2], Vijaya Chikermane[3], Fanta Ongoiba[4], Olesya Falenchuk[5], Bessma Momani[6], Tina Pahlevan[7], Lina Hammad[8], Rama Eloulabi[9], Ahmad Ezzeddine[10], Anmar Al Azzawi[11], Moe Akel[12], Mona Loutfy[13]
[1]Brescia University College at Western, London, Canada, [2]Ontario HIV Treatment Network, Toronto, Canada, [3]7.10 Stories, [4]Africans in Partnership Against AIDS, [5]OISE, University of Toronto, [6]University of Waterloo, [7]Peel Public Health, [8]YSMENA Study, [9]Western University , [10]YSMENA Study, [11]Capital Rainbow Refuge, [12]Alliance for South Asian AIDS Prevention, [13]Women's College Hospital, University of Toronto

Introduction: The Middle East and North Africa (MENA) region faces unique challenges in navigating HIV and sexually transmitted infections, where the spread of HIV is hastened by conflicts and economic upheavals. With growing immigration of MENA communities in Canada and Ontario, supporting youth wellbeing is crucial. YSMENA community-based research study identified key determinants driving how MENA diaspora youth living in Ontario access sexual health and interventions.

Method: Using a mix-method design, data was collected using a quantitative socio-demographic survey and qualitative focus groups with 56 MENA youth, ages 16-29 years in Ontario. Fourteen (14) sequential critical dialogical focus groups were held with youth sub-groups including, gay and bisexual cis men, heterosexual cis men, heterosexual cis women, lesbian and queer cis women, and trans women. Each group participated in two focus group sessions to understand: 1) youth sexual health behaviours and cultural identity and 2) participant recommendations for interventions. An additional focus group, focused solely on interventions was conducted, with representation from all sub-groups. Sessions were transcribed and coded using NVIVO for thematic analysis.

Results: Youth provided recommendations for behavioural, structural and biomedical interventions that reflected the needs of their communities. Intervention suggestions common to all groups included culturally-relevant and language-specific educational programs, online interactive resources leveraging social media, mentorship programs to facilitate community connection, and health navigation tools to strengthen sexual health access and service use. Sub-groups identified specific interventions that would meet their unique needs; for example, trans women newcomers recommended anti-transphobia training with language interpreters; and gay and bisexual men participants recommended cost-free PrEP access.

Conclusion: Youth-driven interventions identified by participants pose significant promise in strengthening the HIV and sexual health response among MENA youth and community in general. The knowledge generated and informed by youth would be especially relevant for community-based health organizations, healthcare practitioners and policymakers.

311 Not (legally) safe sex: The criminalization of HIV non-disclosure despite condom use in Canada

Richard Elliott[1], Cécile Kazatchkine[1], Ryan Peck[2], Léa Pelletier-Marcotte[3], Robin Nobleman[2], India Annamanthadoo[1]
[1]HIV Legal Network, Toronto, Canada, [2]HIV & AIDS Legal Clinic Ontario, Toronto, Canada, [3]Coalition des organismes communautaires québécois de lutte contre le sida, Montreal, Canada

Background: In Canada, someone can be convicted for HIV non-disclosure before sex posing a "realistic possibility of HIV transmission." Some prosecutors and courts have accepted that a suppressed viral load precludes criminalization. However, with respect to condom use, the law and prosecutorial approaches are unsettled, despite Canadian and international scientific consensus that condom use means the possibility of transmission ranges from none (in case of "correct use") to "negligible."

Description: The first 1998 Supreme Court of Canada (SCC) decision on HIV criminalization, several subsequent lower-court rulings, and early prosecutorial policy (in BC), suggested condom use could suffice to avoid conviction. However, a 2012 SCC decision undermined this; court decisions and prosecutorial approaches now vary across the country. In 2016, a Nova Scotia court acquitted based on condom use. In 2018, Canada's Attorney General directed federal prosecutors to "generally" not prosecute when condoms are used. In BC, 2019 policy states condom use "may weigh against prosecution." However, in 2020 the Ontario Court of Appeal upheld a conviction despite consistent condom use (and no evidence of incorrect use or transmission).

Lessons learned: Prosecutors and courts invoke the risk of condoms breaking or slipping, but continued criminalization even in cases of condom use is also rooted in misrepresentations of the science regarding condoms' effectiveness, judicial timidity, and, likely, fear and stigma regarding HIV and sex. Unless the SCC eventually accepts condom use can negate a realistic possibility of transmission, or Parliament legislates this limit, some prosecutions and convictions will continue in such cases.

Conclusions: Criminalizing people who take precautions and pose no to negligible risk of transmission is unfair and discriminatory, unscientific and contrary to international guidance. To limit "overcriminalization of HIV," Parliament should amend the Criminal Code and Attorneys General should adopt policy clearly ruling out prosecution in cases of condom use.

319 HIV Criminalization in Canada: Key Trends and Patterns (1989-2020)

Colin Hastings[1], Notisha Massaquoi[2], Richard Elliott[3], Eric Mykhalovskiy[4], Cécile Kazatchkine[3], India Annamanthadoo[3]
[1]Concordia University, Montréal, Canada, [2]University of Toronto, Toronto, Canada, [3]HIV Legal Network, Toronto, Canada, [4]York University, Toronto, Canada

This paper provides information about the temporal and demographic patterns of HIV criminalization in Canada and the outcomes of HIV non-disclosure criminal cases from 1989 to 2020.

The authors reviewed information on criminal trials related to HIV non-disclosure compiled by the HIV Legal Network, media reports, and legal documents identified through LexisNexis, Quicklaw, and CanLII databases, and consulted with colleagues who are working to address HIV criminalization in Canada.

There have been at least 206 individuals prosecuted, in 224 different criminal cases, in Canada between 1989 and 2020. Two provinces – Ontario and Quebec – account for the majority of criminal prosecutions to date. Data shows that Black men are disproportionately represented in HIV criminalization prosecutions. Black people and Indigenous people appear to be convicted at a higher rate, acquitted at a lower rate, and are more likely to face prison sentences compared to White people who face similar charges.

In recent years, there has been a reduction in prosecutions, however, people living with HIV continued to be charged and convicted for HIV non-disclosure in cases in which their sexual activities pose a negligible risk of HIV transmission or no risk at all. A majority of prosecutions have been for cases that did not involve transmission of HIV. Prosecutions for 'sexual assault' based on alleged HIV non-disclosure have high rates of conviction compared to cases of sexual assault generally, and result in prison sentences that appear to be higher than in other cases of convictions for sexual assault involving forced or coerced sex.

The temporal trends, demographic patterns, and outcomes of HIV criminalization cases highlight the need for the criminal legal system to be better guided by science and by human rights principles in responding to HIV, and for government action to end the harms of HIV criminalization in Canada.

POSTER ABSTRACTS / AFFICHES

Basic Sciences Poster Abstracts / Sciences fondamentales affiches

5 Combination Therapy with Pseudotyped MG1 and SMAC Mimetics to Selectively Kill HIV Infected Cells

Bengisu Molyer[1,2],Yasmeen Ameeriar[2,3],Jonathan B Angel[1,2,4]
[1]Department of Biochemistry, Microbiology and Immunology,University of Ottawa, Ottawa, Canada, [2]Chronic Disease Program, Ottawa Hospital Research Institute, Ottawa, Canada, [3]Translational and Molecular Medicine, University of Ottawa, Ottawa, Canada, [4]Division of Infectitous Diseases, The Ottawa Hospital, Ottawa, Canada

Background: Targeting the latently infected CD4+ T-cells is one of the main challenges in finding a cure for HIV. Although these cells cannot be phenotypically distinguished from their uninfected counterparts, we have demonstrated that the cells latently/persistently infected with HIV have impaired interferon signaling. This defect makes them susceptible to be selectively infected and killed by the oncolytic virus (OV) MG1. Both increasing its specificity to infected cells and sensitizing these cells to its killing can be expected to make MG1 a more effective therapeutic. This project aims to pseudotype MG1 with HIV envelope protein gp160, to enhance targeting of infected cells, and determine if combining MG1 with the SMAC mimetics (SM) LCL-161 and AEG-40730 can increase killing of cells that are latently infected with HIV.

Methodology: For pseudotyping experiments, restriction enzyme cloning, and Gibson Assembly were used to create full length and modified gp160 containing MG1 clones. For SM and MG1 combination experiments, Jurkat cells and their latently HIV infected counterpart J1.1 cells were infected with MG1 and treated with the SM LCL-161 and AEG-40730, and their viability and infection percentage were assessed 24h and 48h post treatment via flow cytometry.

Results: MG1 clones have been verified by sequence analysis and are in the process of being rescued by transfection. The divalent SM AEG-40730 has greater killing effect compared to the monovalent LCL-161 in both cell lines, but neither SM show a preferential killing of J1.1 cells compared to Jurkat cells. Combination of a low dose of LCL-161 and MG1 infection shows significantly increased killing of J1.1 cells.

Conclusion: Both OV and SM therapy are promising therapeutic agents in the field of HIV. A combination of OV and SM therapy can potentially be a new strategy to eliminate cells latently infected with HIV.

9 Reproductive Feto-Toxicity Studies to Evaluate Dolutegravir in Combination with Emtricitabine and Tenofovir in Pregnant Mice on a Folate Deficient Diet

Haneesha Mohan[1], Jessica Nguyen[1], Audrey Yee[1], Evelyn Yukino Laurette[1], Tanvi Sanghvi[1], Oscar Tejada[1], Ben Mackenzie[1], Monica Guzman-Lenis[1], Nicholas Greene[3], Andrew Copp[3], Lena Serghides[1,2]

[1]University Health Network (UHN), Toronto General Research Institute, Princess Margaret Cancer Research Tower (PMCRT), Toronto, Canada, [2]Department of Immunology and Institute of Medical Sciences, University of Toronto, Toronto, Canada, [3]Developmental Biology and Cancer Department, UCL Great Ormond Street Institute of Child Health, University College London, London, UK

Background: Dolutegravir (DTG), an integrase strand transfer inhibitor (INSTI), is a WHO-alternative first-line regimen. Initial findings from an observational study in Botswana showed an elevated incidence of neural tube defects (NTDs) with peri-conceptional exposure to DTG. We have previously shown that DTG exposure yielding therapeutic levels in pregnant mice on a folate sufficient diet was associated with higher rates of fetal anomalies compared to control-treated mice. Here we explore potential DTG reproductive toxicities in a folate deficient pregnancy mouse model.

Methods: Female C57BL/6 mice fed a folic acid deficient diet for a minimum of 2 weeks, were mated and randomly allocated to either control (water) or 1x-DTG (2.5mg/kg DTG+50mg/kg tenofovir 33.3mg/kg emtricitabine). Drug/water was administered once daily by oral gavage from day of plug detection to sacrifice at E15.5. Fetuses were assessed for anomalies by two independent reviewers who were blinded to treatment allocation. Mixed effects logistic regression was used to assess differences between treatment groups accounting for litter effects.

Results: A total of 1533 fetuses from 209 litters were assessed (control n=103 litters, 756 fetuses; 1x-DTG n=106 litters, 777 fetuses). Percent viability, placental weight, fetal weight, fetal/placenta weight ratio, and maternal weight gain did not differ between groups. Crown-lump length was lower and head width was higher in the 1x-DTG vs. control groups. Seven NTDs (exencephaly, n=2; encephalocele, n=3; spinal bifida, n=2) were observed in the 1x-DTG group (7/777=0.9%), with no NTDs in controls. Fetuses exposed to 1x-DTG also had higher rates of severe turning defects (2.2% vs. 0.4%, p=0.04), abdominal wall defects (3.5% vs. 0.4%, p=0.04), limb defects (3.9% vs. 0.5%, p=0.001), cranial/spinal bleeds (15.7% vs. 5.4%, p<0.001), and severe edema (7.0% vs. 1.3%, p<0.001).

Conclusion: DTG treatment was associated with higher rates of fetal anomalies compared to controls in pregnant mice on a folate-deficient diet.

11 Anti-HIV activity of the human antimicrobial peptide LL-37, and its engineered peptide, 17BIPHE2

Ana Vera-Cruz[1,2], Stephanie Burke-Schinkel[2], Nongnuj Tanphaichitr[1,2,3], Jonathan B. Angel[1,2,4]
[1]Department of Biochemistry, Microbiology, & Immunology, University of Ottawa, Ottawa, Canada, [2]Chronic Disease Program, Ottawa Hospital Research Institute, Ottawa, Canada, [3]Department of Obstetrics/Gynecology, University of Ottawa, Ottawa, Canada, [4]Department of Infectious Diseases, The Ottawa Hospital, Ottawa, Canada

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, an effective spermicide on human sperm, has broad antimicrobial activity including in vitro activity against HIV. 17BIPHE2 is 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.

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. In addition, HIV was incubated with 17BIPHE2 prior to infection of various target cells for HIV infection. Alternatively, target cells were incubated with 17BIPHE2 prior to HIV infection. Infection was quantified by luciferase activity in an HIV reporter TZM-bl cell line and by p24 ELISA in activated PBMC and CD4+ T cells.

Results: In ACH-2 cells, there was significant reduction in p24 production when cells were treated with 17BIPHE2, but not LL-37. When 17BIPHE2 was pre-incubated with HIV prior to infection and present during infection, viral replication decreased in the TZM-bl reporter cell line, but this result was not recapitulated in the primary activated cells, PBMCs nor isolated CD4+ T cells. Conversely, pre-incubation of 17BIPHE2 with target cells prior to infection significantly inhibited HIV infection in a dose-dependent manner. Initial mechanistic studies involving evaluation of cell-surface markers of activation and co-receptor expression indicated no change between untreated and 17BIPHE2-treated cells.

Conclusion: 17BIPHE2 may act on the cell or on the cell/virus interaction rather than on the virus itself to inhibit HIV infection and presents a promising anti-HIV therapy that may be developed into an effective MPT.

21 Peptidomimetic Inhibitors of the Nef–Src Family Kinase Interaction as Adjuvants in an Immune-Directed HIV-1 Cure

Antony Lurie[1], Corby Fink[1,2], Robert Hudson[3], Gregory Dekaban[1,2], Jimmy Dikeakos[1]
[1]Department of Microbiology and Immunology, Schulich School of Medicine and Dentistry, University of Western Ontario, London, Canada, [2]Biotherapeutics Research Laboratory, Robarts Research Institute, Schulich School of Medicine and Dentistry, University of Western Ontario, London, Canada, [3]Department of Chemistry, University of Western Ontario, London, Canada

Efforts to develop a practical HIV-1 cure have largely focused on immune-directed strategies which rely on the action of cytotoxic T lymphocytes (CTLs) to clear infected cells in vivo. Yet, as HIV-1-infected cells are intrinsically resistant to CTL killing, these cures exhibit poor efficacy.

To evade CTL killing, HIV-1 encodes the protein, Nef, which blocks viral antigen presentation by binding and activating a suite of Src family kinases (SFKs) that ultimately leads to the downregulation of cell surface major histocompatibility complex class I (MHC-I). Inhibiting the Nef–SFK interaction may therefore be a direct approach to functionalize an immune-directed HIV-1 cure by rescuing cell surface MHC-I and enhancing CTL-mediated infected cell killing.

Previously, our group identified a dipeptide derivative predicted to bind Nef, termed H3-1. Subsequent studies established H3-1 to inhibit the Nef–SFK interaction in vitro and to modestly rescue cell surface MHC-I in cell culture, while mouse studies identified H3-1 to be rapidly cleared in vivo.

Therefore, we aim to use H3-1 as a chemical starting point to develop Nef–SFK interaction inhibitors with improved in vivo stability. We hypothesize that H3-1's peptidic structure is central to its instability in vivo and thus are using organic synthesis to generate a peptidomimetic panel of H3-1 analogues.

Specifically, we are pursuing the thioamide and methyleneamino replacements of H3-1's amide group, and the methyl ester, amide and tetrazole replacements of H3-1's carboxylic acid group. In parallel, using a series of cell culture experiments, we are characterizing each analog on variables including toxicity, Nef–SFK interaction inhibition, MHC-I rescue and biostability. By integrating each of these measures, we aim to identify a next-generation in vivo stable Nef–SFK inhibitor, which will enable us to evaluate the utility of Nef-mediated MHC-I downregulation blockade in an HIV-1 cure

23 HIV-1 Rev Hijacks the Host Membrane Trafficking Protein PACS-1 to Facilitate Efficient Viral Protein-RNA Complex Localization during Replication

Rong xuan Zang[1], Steven Trothen[1], Jimmy Dikeakos[1]
[1]*University Of Western Ontario, London, Canada*

HIV-1 assembly is dependent on the expression of structural proteins (Gag/Pol) and their dynamic interactions with the RNA genome. Similar to other retroviruses, the HIV-1 genome is integrated into host cell chromosomal DNA within the nucleus.

It is well-established that HIV-1 encodes the Rev protein to facilitate the nuclear export of intron-containing Gag/Pol mRNA. Once within the cytoplasm, additional evidence suggests Rev further enhances Gag/Pol mRNA translation and Gag protein-RNA interaction as part of virion assembly. Yet, the mechanism underpinning Rev-RNA complex cytoplasmic localization remains poorly understood.

Additionally, the molecular driver responsible for directing the Rev-RNA complex to different sites of translation and assembly has not been elucidated. Recently, a membrane sorting protein in the endolysosomal pathway, PACS-1, was demonstrated to interact with HIV-1 Rev.

Thus, we hypothesize HIV-1 Rev hijacks PACS-1 to serve as a molecular driver to enhance protein translation and virion assembly. Herein, we utilized bimolecular fluorescence complementation and confocal microscopy, to demonstrate that Rev interacts with PACS-1 within the perinuclear region.

Furthermore, the Rev and PACS-1 interaction decreased in the presence of Rev mutants deficient in RNA binding, oligomerization, or nuclear export. Upon HIV-1 infection of CD4+ HeLa cells, we observed that PACS-1 co-localized with HIV-1 Rev across various subcellular locations, including ribosomes and endosomes. In particular, the strength of co-localization was dependent on distinct stages of the viral replication cycle. Overall, this research presents an important regulatory pathway during HIV-1 assembly for future therapeutic targets and provides novel insights into the mechanism of RNA subcellular trafficking.

55 Development of VLP Vaccine Harboring the DC-targeting domain of Ebola glycoprotein and HIV Envelope Conserved Elements

Zhujun Ao[1], Mona Mahmoudi[1], Titus Olukitibi[1], Xiaojian Yao[1]
[1]*University of Manitoba, Winnipeg, Canada*

Background: The development of an effective vaccine against HIV infection remains a global priority. Dendritic cell (DC)-based HIV vaccine and targeting the conserved regions of HIV-1 envelope (Env) are very promising at optimizin the HIV-specific immune responses.
Objective: Infusion of the highly conserved elements (CE) of HIV envelope glycoprotein including the 9 highly conserved elements (9CE) in HIV gp120 or the Membrane-Proximal External Region (MPER) on the gp41, with the DC-targeting domains of EboGP (EboGPΔM), and test their ability to target DCs/Macrophages and to induce immunes responses in mouse.

Methods: To produce VLPs, we transfected 293T cells with EboGPΔM-9CE, EboGPΔM-MPER or HIV Env plasmids, packaging plasmid (Δ8.2) and together with or without a multiple-gene deleted HIV-based vector encoding a Gaussia luciferase gene (ΔRI/ΔEnv/Gluc). Female BALB/c mice were immunized subcutaneously with 100 ng P24 of EboGPΔM-MPER, EboGPΔM-9CE, HIV Env-VLPs or PBS on days 0, 21 and 56. At days 21, 34, and 76 of post-immunization, the mice blood was collected and the anti-HIVgp41, -HIVgp140, -HIVp24 and -EboGP specific antibodies were measured by corresponding ELISA.

Results: Data showed that the EboGPΔM-9CE or EboGPΔM-MPER was expressed in the cells and incorporated into VLPs that can efficiently target a human monocyte cell line (THP-1) and human monocyte-derived macrophages (MDMs). Animal studies revealed that immunization with VLPs containing the above chimeric proteins, especially EboGPΔM-MPER, induced significantly higher anti-HIV Env antibodies than HIV-Env-VLPs alone in mouse serum. Furthermore, this study suggested that EboGPΔM-MPER has induced not only a more effective immune response to MPER but also enhance the immune response against other HIV components, such as HIV Gag.

Conclusion: EboGPΔM-MPER pseudotyped HIV VLPs significantly enhanced HIV-specific immune responses and represented as a potential vaccine candidate.

56 Development and Characterization of Recombinant Vesicular Stomatitis Virus (rVSV)-based Bivalent Vaccine Against COVID-19 Delta Variant and Influenza Virus

Zhujun Ao[1], Maggie Ouyang[1], Titus Olukitibi[1], Bryce Warner[2], Robert Vendramelli[2], Thang Truong[2], Manli Zhang[1], Sam Kung[1], Keith R Fowke[1], Darwyn Kobasa[2], Xiaojian Yao[1]
[1]University Of Manitoba, Winnipeg, Canada, [2]Special Pathogens Program, National Microbiology Laboratory, Winnipeg, Canada

Background: COVID-19 and influenza are both highly contagious respiratory diseases with a wide range of severe symptoms and cause great disease burdens globally. It has become very urgent and important to develop a bivalent vaccine that is able to target these two infectious diseases simultaneously.

Objective: We generated several rVSV bivalent vaccine candidates that co-expressed SARS-CoV2 Delta variant spike protein (SP) or RBD and four copies of highly conserved influenza M2 ectodomain (M2e) fused with a DC-targeting/activation domain derived from EBOV GP (EboGPΔM) based on our previously reported vaccine platform. Here, we characterized the expression of SARS-CoV-2 Delta variant spike protein (SP) or RBD and influenza M2 ectodomains of these bivalent vaccine candidates and their abilities to induce immune responses against SARS-CoV-2 SP, especially Delta SP, and influenza M2e.

Results: Our studies showed that in contract to the VSVwt, these VSV biovalent vaccines showed much attenuated replication kinetics had no or much milder cytopathic effects in most tested cell lines. Animal studies have shown that immunization with these bivalent rVSV vaccines induced efficient humoral and cell-mediated immune responses against both SARS-CoV-2 and influenza M2e protein. Significantly, our vaccine candidates induced production of high levels of neutralizing antibodies that protected cells against SARS-CoV-2 Delta and other SP-pseudovirus infections in culture. Furthermore, vaccination with the bivalent VSV vaccine via either intramuscular or intranasal route efficiently protected mice from the lethal challenge of H1N1 and H3N2 influenza viruses and significantly reduced viral load in the lungs.

Conclusion: These studies provide convincing evidence for the high efficacy of this bivalent vaccine to prevent influenza replication and initiate robust immune responses against SARS-CoV-2 Delta variants. Further investigation of its efficacy to protect against SARS-CoV-2 Delta variants will open a new avenue to control two contagious respiratory infections, COVID-19 and influenza

58 The Potential of Oxytocin in Modulating Female Genital Tract Epithelium to Prevent HIV Transmission

Andrew Plesniarski[1,2], T. Blake Ball[2,1], Ruey-Chyi Su[2,1]
[1]Department of Medical Microbiology and Infectious Diseases, Faculty of Health Sciences, University of Manitoba, Winnipeg, Canada, [2]JC Wilt Infectious Diseases Research Centre, National Microbiology Laboratories, Public Health Agency of Canada, Winnipeg, Canada

Introduction: Oxytocin, a neuropeptide released during sexual activity and physical touch, is shown to have anti-inflammatory effects on gut and skin epithelium. Human immunodeficiency virus (HIV) takes advantage of inflammation at the female genital tract (FGT) to facilitate its replication and transmission. This study examines if oxytocin reduces immune activation, improves epithelial wound healing, and protects HIV target cells from infection at the FGT.

Methods: Vaginal (Vk2), ectocervical (Ect1), and endocervical (End1) cell lines were grown in monolayers. RNA isolated from these cell lines, before and after stimulation with 1 µg poly(I:C)/LyoVec and/or 10, 100, 1000, or 10 000 pg/mL oxytocin, was evaluated for the effect of oxytocin on inflammatory gene expression using RT-qPCR. Oxytocin's effects on wound healing were assessed using scratch assays with monolayers pre-treated with 10 000 pg/mL oxytocin. Triple-knockout mice, transplanted with stem cells from human bone marrow and fetal liver and thymus (TKO-hBLT), were used as an in vivo model to assess whether intravaginal administration of oxytocin (1.6 IU/kg) directly impacts immune activation of peripheral blood mononuclear cells (PBMCs) by measuring HLA-DR, CD38, CD69, and CCR5 expression via flow cytometry.

Results: Oxytocin (10 000 pg/mL) treatment reduced the expression of both IL-6 and IL-1β in End1 cells by 50% ($p<0.05$; $n=6$). This was reversed by poly(I:C)/LyoVec stimulation. Scratch assays showed no effect of oxytocin on wound closure. Data from TKO-hBLT mice showed that intravaginal oxytocin had no effect on the expression of PBMC activation markers ($n=4$).

Discussion: Oxytocin reduced the expression of inflammatory genes in End1 cells, which implies its ability to modulate immune activation at the vulnerable endocervical site. Although oxytocin had no direct effect on FGT epithelial wound healing, its indirect role in epithelial barrier properties should be investigated. Further investigation of oxytocin's role in regulating immune activation at FGT mucosa is needed.

61 Role of PICALM in HIV-1 pathogenesis: interactions between the endocytic, autophagic and immunity pathways

Norma Paola Guizar Amador[1,2], Kristin Davis[1,2], Anne Monette[2], Ana Luiza Abdalla[1,2], Meijuan Niu[2], Chen Liang[1,2], Andrew Mouland[1,2]
[1]Mcgill University, Montréal, Canada, [2]Lady Davis Institute at the Jewish General Hospital, Montréal, Canadá

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. These host proteins have important roles in the replicative cycle of the retrovirus, and they are essential to understand in order to develop effective antiviral strategies.

However, despite their potential as possible targets, 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 in CD4+ TZM-bl reporter cells. This led to the identification of phosphatidylinositol-binding clathrin assembly protein (PICALM) as a meaningful host protein in HIV-1 infection, which was confirmed in subsequent experiments in SUP-T1 CD4+ T cells.

The absence of PICALM, a protein that has been previously characterized as intrinsic or related to clathrin-mediated endocytic and autophagy pathways, lead to a reduced viral entry by more than 2-fold ($p \leq 0.001$).

In addition, PICALM knockout (KO) cells showed changes in other pathways, including the PD-1 and autophagy pathways, resulting in an altered memory phenotype, and changes in intracellular trafficking and abundance of viral HIV-1 Gag.

Overall, this work reveals PICALM as a modulator of viral entry, autophagy flux, and immune control of HIV-1 replication.

63 GDF15 influences risk of non-AIDS comorbidities and HIV reservoir size independently of inflammation in ART-treated PLWH

Stéphane Isnard[1,2,3], Léna Royston[1,2,3], Franck P. Dupuy[1,2], John Lin[1,2], Brandon Fombuena[1,2], Simeng Bu[1,2], Carolina Berini[1,2], Nicole F. Bernard[1,2], Jean-Pierre Routy[1,2,4]
[1]Mcgill University Health Centre - Research Institute, Montréal, Canada, [2]McGill University Health Centre - Chronic Viral Illness Service, Montréal, Canada, [3]Canadian HIV trials Network , Vancouver, Canada, [4]McGill University Health Centre - Division of Hematology, Montréal, Canada

Background: Growth differentiation factor-15 (GDF15) is an atypical member of the TGF-β family involved in tissue reparation, metabolism regulation, and control of appetite. GDF15 levels are one of the best markers of aging, and are elevated upon cardiovascular diseases, some cancers and COVID-19. Herein, we assessed the association between plasma GDF15 levels and clinical characteristics, inflammation and HIV reservoir size in ART-treated PLWH. We analyzed the origin and the effect of GDF15 on immune cells.

Method: Blood was obtained from 55 ART-treated PLWH (median treatment 14.5 years) and 50 uninfected controls. GDF15, markers of inflammation (IL1β, IL6, IL8, TNFα, IP10, CXCL13, sCD14) and non-AIDS comorbidities (soluble urokinase plasminogen activator receptor [suPAR]) were quantified in plasma by ELISA. HIV integrated DNA was quantified by nested-qPCR in sorted CD4 T-cells. GDF15 producing cells were identified by flow cytometry. GDF15 response was analyzed by flow cytometry.

Results: Plasma GDF15 levels were higher in PLWH than uninfected controls ($p<0.001$). GDF15 levels were not associated with inflammation, nor gut permeability markers, and was not induced upon in vitro inflammatory stimulations. Conversely to other markers, GDF15 levels were strongly associated with integrated HIV DNA levels ($r=0.59$, $p<0.01$) and suPAR (0.68, $p<0.0001$) independently of age, sex, and CD4 count. Ex vivo, GDF15 protein was only found in monocytes, and not in T or B cells, NK cells nor dendritic cells in PBMC. In vitro, stimulation with recombinant GDF15 induced tyrosine phosphorylation in CD4 and CD8 T-cells, indicating a potential direct effect of GDF15 on those cells. GFRAL, the only currently known receptor of GDF15, was not expressed on T-cells.

Conclusion: As classical markers of inflammation were not linked with GDF15 levels, our results suggest a new link, possibly metabolic, that might be targeted to decrease HIV persistence and risk of non-AIDS comorbidities in ART-treated PLWH.

67 Characterizing the Surface of HIV Virions using Flow Virometry

Jonathan Burnie[1,2], Arvin T. Persaud[1,2], Shubeen Ahmed[1], Timothy Lee[1], Vera A. Tang[3], Christina Guzzo[1,2]
[1]Department of Biological Sciences, University of Toronto Scarborough, Scarborough, Canada, [2]Department of Cell and Systems Biology; University of Toronto, Toronto, Canada, [3]Department of Biochemistry, Microbiology, and Immunology, Faculty of Medicine, Ottawa, Canada

Despite being a relatively simple virus with only one viral envelope glycoprotein (Env), HIV has caused one of the largest pandemics in history. HIV Env is highly glycosylated, well shielded from most humoral responses and is in relatively low abundance on virions (~8-14 spikes), which collectively, complicates strategies targeting this molecule on the virus.

While Env is sparse on the HIV surface, numerous cellular proteins acquired from the host membrane during budding can decorate the HIV surface. Notably, some cellular proteins can be in excess of Env, suggesting that they could serve as attractive targets for therapeutic strategies. Understanding the biology of these virion-incorporated cellular proteins in HIV infection is critical since some host proteins can impact virion infectivity and homing.

Previous studies of host proteins on HIV have traditionally employed bulk techniques which assess the average of virus populations instead of individual virions. Our work uses an emerging technique called flow virometry (FV) to characterize the surface of virions and quantify virion-incorporated proteins on individual virus particles.

Importantly, our single virion analyses are conducted without additional methods to enhance virus detection (concentration, coupling to magnetic beads, etc.), removing additional biases that these methods can add. Notably, using fluorescence reference beads and calibration software, we provide estimates of total proteins present on individual virions, which are in line with data reported from traditional methods.

Finally, in an effort to adapt this technique for phenotyping viruses from clinical samples, we have generated initial success in staining proteins of interest on virions in human plasma and sera. These findings highlight the utility of FV to phenotype virions, which may be useful in clinical applications or in identifying new targets on HIV for alternative therapeutic strategies.

68 Detection of IFITM3 clusters on the plasma membrane by single-molecule imaging

Jacqueline Chia-Ling Sung[1], Vicky Kliemke[2], Qian Liu[2], Chen Liang[1,3,4]
[1]Department of Microbiology and Immunology, McGill University, Montreal, Canada, [2]Institute of Parasitology, McGill University, Montreal , Canada, [3]Department of Medicine, McGill University, Montreal, Canada, [4]Lady Davis Institute, Jewish General Hospital , Montreal, Canada

Interferon-induced transmembrane (IFITM) proteins have been shown to inhibit a wide range of enveloped viruses including influenza virus, Dengue virus, and human immunodeficiency virus type 1 (HIV-1).

The key role of IFITM3 protein in host antiviral defense is supported by the severe morbidity and high mortality in IFITM3 knockout mice upon influenza virus infection, as well as severe influenza virus infection and rapid progress of HIV-1 infection associated with single nucleotide polymorphisms in IFITM3. IFITM3 restricts virus infection by impeding virus entry. The underlying molecular mechanisms include the alteration of membrane properties by IFITM3, such as membrane fluidity and curvature, which halts the fusion of viral membrane with cellular membrane.

It is incompletely understood how IFITM3 protein changes membrane properties. One hypothesis is that IFITM3 is localized to lipid rafts partly because of its palmitoylation at the cysteine residues, thus increasing membrane rigidity.

However, a recent study showed partition of IFITM3 to the non-raft region in lipid vesicles. To determine the distribution of IFITM3 on the plasma membrane of intact cells with reference to lipid rafts, we used the single-molecule imaging technology that allows the direct observation of IFITM3 organization at a 10 nm resolution, which is 10 times smaller than an HIV-1 particle.

Both the ectopically expressed IFITM3 and the interferon-induced endogenous IFITM3 form clusters of 50 to 100 nm in size, and are interspersed between lipid rafts that are labeled with cholera toxin B. Our data suggest that IFITM3 increases the rigidity of membranes by acting on the non-raft, disordered regions.

74 Combination anti-HIV gene therapy using shRNAs, aptamers and U1i RNAs strongly inhibit HIV-1 replication in T-cells without inducing cellular toxicity

Ryan Goguen[1,2], MIchelle Chen[1,3], Camille Malard[1,2], Olivier Del Corpo[1,3], Aïcha Daher[1], Anne Gatignol[1,2,3], Robert Scarborough[1,2]
[1]Lady Davis Institute for Medical Research, Montreal, Canada, [2]Department of Microbiology and Immunology, McGill University, Montreal, Canada, [3]Division of Experimental Medicine, McGill University, Montreal, Canada

Background: Gene therapy using lentiviruses expressing RNA molecules represents a long-term treatment towards a cure for HIV infection to replace combination antiretroviral therapy and its daily administration. To effectively control HIV infection by gene therapy and avoid viral rebound, a combination of at least three antiviral RNA molecules will most likely be necessary. Classes of anti-HIV RNAs include: (1) short hairpin (sh)RNAs, which bind and cleave their viral RNA target site through the RNA-induced silencing complex; (2) aptamers which bind and inactivate a target protein or RNA through their three-dimensional structure; and (3) U1 interference (U1i) RNAs which cause either excessive splicing or inhibition of polyadenylation of a target RNA by the U1 small nuclear RNP (snRNP).

Methods: We have expressed different anti-HIV RNAs on lentiviral vectors and evaluated their activity by radioactive reverse transcriptase assays as well as cytotoxicity by competitive growth assays in a SupT1 cell line.

Results: We have shown that anti-HIV shRNAs are more potent when expressed by the RNA polymerase (Pol) III promoters U6 and 7SK in comparison to the H1 promoter due to a higher expression level. Although we have demonstrated that cytotoxicity exists when certain shRNAs are expressed from the U6 and 7SK promoter, we have discovered that replacing the loop of shRNAs with an aptamer effectively eliminates this toxicity. We also provide evidence that the combination of both anti-HIV U1i RNAs and shRNAs delays viral replication with little to no toxic effects.

Conclusion: Increased efficacy combined with decreased cytotoxicity will be most important in the development of anti-HIV and other gene therapies. Our work in optimizing the expression of anti-HIV RNAs is critical to designing the most effective combination gene therapies and has led to the discovery of a method to prevent shRNA-mediated cytotoxicity.

82 HIV-1 Repositions Late endosomes / Lysosomes and Alters their Motility to Direct Gag to Virus-Containing Compartments (VCC) in Macrophages

Gabriel Guajardo Contreras[1,2], Catherine Vandal[3,4], Alex Chen[5,6], Meijuan Niu[2], Alan Cochrane[5,6], Roger Lippe[3,4], Andrew J. Mouland[1,2]
[1]Department of Medicine, Mcgill University, Montreal, Canada, [2]Lady Davis Institute at the Jewish General Hospital, Montreal, Canada, [3]Centre de recherche du CHU Sainte-Justine, Montreal, Canada, [4]Department of Pathology and Cell Biology, Université de Montréal, Montreal, Canada, [5]The Institute of Medical Sciences, University of Toronto, , Toronto, Canada, [6]Department of Molecular Genetics, University of Toronto, Toronto, Canada

Currently, 38 million people are living with HIV-1. The implementation of cART inhibits HIV-1 replication but fails to eliminate latently infected cells. In macrophages, HIV-1 buds/accumulates in invaginations of the plasma membrane, termed virus-containing compartments (VCC), which are important for HIV-1 immune evasion and cell-to-cell transmission.

How HIV-1 is directed to its budding site is not fully understood, but previous research in HeLa cells suggests that late endosomes / lysosomes (LELs) play a role in HIV-1 Gag trafficking. By repositioning LELs towards the juxtanuclear area, a population of Gag co-traffics with LELs, resulting in a decrease in viral release, while repositioning towards the cell periphery increases it. Downregulation of LELs proteins reduces HIV-1 release, altogether supporting LELs directing Gag towards budding sites.

Here, we hypothesize that Gag hijacks LELs to direct HIV-1 assembly to VCC in infected macrophages. We used the THP-1 Gag-zip cell line, which has integrated a doxycycline-inducible HIV-1 Gag-GFP genome. By immunofluorescence, we observed at 72 hrs post dox-induction Gag-GFP accumulation in distinctive areas, which colocalized with the VCC marker CD81. Ultrastructural confirmation of VCC by electron microscopy is under way.

We further evaluated LELs involvement and Rab7 or Lamp1 colocalized with Gag-GFP at VCC, but colocalization was stronger at surrounding areas. Finally, by tracking single LELs, we observed a population that co-trafficked with Gag-GFP, associated with a significant decrease in LELs tracks straightness and increase in speed variation.

Here, we provide evidence that THP-1 Gag-zip macrophages resemble VCC as observed in HIV-1 infected monocyte-derived macrophages, and that Gag induction alters LELs positioning and motility. Further investigation will aim to understand how to target VCC for viral clearance and the design of new approaches to lead us closer to a cure. Supported by CIHR project grants to AJM and RL, NSERC to RL, and ANID-Chile-72210500 to GGC.

83 3D Printed Intravaginal Rings by Fused Filament Fabrication Technology for the delivery of Nanomedicine as a Strategy to Prevent HIV Infection

Nehil Ranjitham Gopalakrishnan[1,2], Emmanuel Ho[1,2]
[1]School Of Pharmacy, University Of Waterloo, Kitchener, Canada, [2]Waterloo Institute for Nanotechnology, Waterloo, Canada

It is estimated that over 37.5 million people are living with HIV worldwide, over 1.5 million new infections were reported and 680,000 AIDS-related deaths were recorded in 2020. With the growing number of new HIV infection and AIDS related deaths worldwide, there is an urgent need for new and effective means to tackle the spread of HIV infection.

In our project, we aim to develop a 3D printed intravaginal scaffold as a two-pronged approach to the problem. Acetylsalicylic acid (ASA), an anti-inflammatory drug, will be delivered along with tenofovir disoproxil fumarate (TDF) to help reduce vaginal inflammation and enhance the anti-viral activity. 3D printing will be employed to design and fabricate the scaffold system to regulate drug release over an extended period thereby improving adherence among patients.

These macaque sized intravaginal rings will be printed using fused filament fabrication type of 3D printing and thermoplastic polyurethane 60D35 polymer filament. ASA and TDF nanoparticles will be suspended in a gel matrix and loaded onto the intravaginal rings (IVR) for a controlled drug release.

Ring design parameters will be optimized to achieve an extended release of the drugs. The nanoparticles prepared had an average diameter of 187±1.73nm and a zeta potential of -29.3±1.63mV. The double emulsion technique of nanoparticle fabrication achieved an encapsulation efficiency of 84.65±0.84%.

A cyclic oligosaccharide, β-Cyclodextrin and non-aqueous gel formulations were tried to improve the stability of acetylsalicylic acid, an ester. Aspirin loaded hydroxyethyl cellulose based non aqueous gel showed the highest stability and temperature was found to be inversely proportional to the stability. Cytotoxicity studies on SupT1 cell lines were performed using ASA and TDF and found to be safe at practical concentrations.

Future studies involve studying the targeting potential of nanoparticles and optimization of the final IVR for an extended release.

86 HIV genetic diversity and compartmentalization in lung and blood of individuals on long-term cART

Aniqa Shahid[1,2], Bradley R Jones[2,3], Julia Yang[4], Winnie Dong[2], Kathryn Donohoe[4], Chanson J Brumme[2,5], Jeffrey B Joy[2,3,5], Janice M Leung[4,6], Zabrina L Brumme[1,2]
[1]Simon Fraser University, Burnaby, Canada, [2]British Columbia Centre for Excellence in HIV/AIDS, Vancouver, Canada, [3]Bioinformatics Program, University of British Columbia, Vancouver, Canada, [4]Centre for Heart Lung Innovation, University of British Columbia, Vancouver, Canada, [5]Department of Medicine, University of British Columbia, Vancouver, Canada, [6]Division of Respiratory Medicine, Department of Medicine, University of British Columbia, Vancouver, Canada

Background: Lung remains an understudied site of HIV persistence. We characterized proviral diversity and compartmentalization in blood and broncheoalveolar lavage (BAL) in individuals with HIV on long-term cART.

Methods: Subgenomic HIV sequences (nef region) were characterized by single-genome approaches from matched blood (buffy coat) and BAL specimens from 9 individuals with suppressed viral loads on cART. Markov chain Monte Carlo methods were used to infer a distribution of ~1,000 within-host phylogenies in MrBayes. Diversity metrics were calculated from the highest-likelihood phylogeny. Genetic compartmentalization was assessed using Hudson, Boos and Kaplan's nonparametric test for population structure (KST) and the Slatkin-Maddison (SM) test, with the latter results conditioned over all trees.

Results: We isolated 1,025 nef sequences (788 blood, 237 BAL). Of these, 882 (86%) were intact (i.e., non-hypermutated, without other defects), yielding medians of 78 (Q1-Q3=58-90) and 14 (Q1-Q3=6-37) intact sequences/individual for blood and BAL, respectively. Consistent with clonal expansion, 331/882 intact sequences (38%) were identical to another collected, where 7/9 individuals harbored at least one specific sequence that was present in both blood and BAL. In three participants, identical sequences represented ≥50% of their overall pool, whereas in others, most sequences were unique. Overall, the diversity of unique HIV sequences in blood reflected that in BAL (Spearman’s r=0.75, p=0.02). When considering unique sequences per compartment, strong evidence for compartmentalization, defined as statistically significant support in both KST and SM test results, were not observed for any participant's dataset.

Conclusion: Proviral nef sequence diversity in blood during cART is representative of that in the lung, with no evidence of genetic compartmentalization between these two sites. The presence of identical HIV sequences in blood and lung is consistent with migration of clonally-expanded reservoir cells between these two sites. Eradication strategies will need to contend with genetically diverse HIV in blood and tissues.

87 CAVES: A Novel Tool for Comparative Analysis of Variant Epitope Sequences

Katherine Li[1,2], Connor Lowey, Paul Sandstrom[1,2], Hezhao Ji[1,2]
[1]University Of Manitoba, Winnipeg, Canada, [2]Public Health Agency of Canada, Winnipeg, Canada

In silico methods for epitope prediction have become a critical part of vaccine and therapeutic design during the COVID-19 pandemic, but intra-species comparison of putative epitopes remains a difficult task that is laborious and prone to human error. Created for studying SARS-CoV-2 variants of concern, Comparative Analysis of Variant Epitope Sequences (CAVES) is a novel tool designed for rapid comparative analyses of epitopes amongst closely related pathogens, substantially reducing the required time and user workload.

CAVES utilizes two comparison levels to extract information about the relationship between epitopes from two sequences and their relevance in published literature. The level-one analysis compares two epitope prediction files from the Immune Epitope Database-Analysis Resource (IEDB-AR), while the level-two analysis incorporates search results from the IEDB database of experimentally confirmed epitopes, effectively characterizing the similarities/differences amongst putative epitopes and determining whether they exist in the current database.

CAVES utilizes a graphical user interface on Windows operating systems, making it widely accessible regardless of coding expertise. Each comparison level sorts epitopes into categories of exact matches, partial matches, or novel epitopes by the degree to which they match with peptides from the opposing file. Furthermore, CAVES uses sequence positional data to improve its accuracy and speed, taking only a fraction of the time required by manual analyses and removing the risk of human error.

CAVES is highly applicable for evolutionary analyses as epitopes labelled as exact matches can be considered as conserved amongst the two sequences, while those labelled as novel are unique epitopes that were gained/lost during pathogen evolution. CAVES can be used to determine the similarities/differences of epitopes amongst any species and is particularly relevant for pathogens with high mutability like HIV-1. Additionally, CAVES is widely applicable beyond evolutionary objectives and can be used for confirmatory purposes when using multiple epitope prediction programs.

102 Characterizing in vitro LAG-3 and PD-1 Exhaustion Marker Kinetics and Therapeutic Blockade System on invariant Natural Killer T (iNKT) cells: Implications in Chronic HIV Infection

Allison Balasko[1], Julie LaJoie[1,2], Keith R Fowke[1,2,3,4]
[1]Department of Medical Microbiology and Infectious Diseases, University of Manitoba, Winnipeg, Canada, [2]Department of Medical Microbiology, University of Nairobi, Nairobi, Kenya, [3]Department of Community Health Sciences, University of Manitoba, Winnipeg, Canada, [4]Partners for Health and Development in Africa, Kenya

Background: Invariant Natural Killer T (iNKT) cells are innate lymphocytes critical in combatting viral infection by bridging the innate and adaptive immune systems. Our lab showed in HIV infection, expression of lymphocyte activation gene 3 (LAG-3), an inhibitory immune checkpoint marker, is increased on iNKT cells and correlated with decreased functionality. Another checkpoint molecule, program cell-death-1 (PD-1), is shown to be increased on iNKT cells in HIV infection, correlating to decreased function. LAG-3 and PD-1 expression kinetics and relationship to iNKT cellular function is not well characterized, and it is unknown whether blocking LAG-3 alone, or in conjunction with PD-1, will restore iNKT function and immune effectiveness.

Methods: Utilizing peripheral blood mononuclear cells from HIV-uninfected donors (n=4), iNKT expression of LAG-3 and PD-1 was assessed via a multi-day stimulation (24hr, 48hr, 4, 7, 10 day). Efficacy of anti-LAG-3 and anti-PD-1 antibody blockades was assessed via a 10-day assay, with enhanced proliferation as the main outcome monitored.

Results: Percent and median fluorescence intensity (MFI) of both LAG-3 and PD-1 peaked at Day 7 (LAG-3: 88.5%, 6163.8 MFI; PD-1: 80.5%, 7731.8 MFI), with a steep decrease by Day 10, when iNKT proliferation was at its peak. In the presence of the anti-LAG-3 or anti-PD-1 antibody blockades, there was a 14-fold increase and 17-fold increase of the iNKT population, respectively. Combining anti-LAG-3 and anti-PD-1 blockade systems resulted in 22-fold proliferation increase.

Significance: This study is the first to characterize LAG-3 and PD-1 expression kinetics on iNKT cells and provides proof-of-concept for LAG-3 and PD-1 as immunotherapeutic targets, by restoring cellular proliferative ability. This blockade system will be applied to HIV-positive samples to assess if HIV-mediated dysregulation of iNKT function can be reversed and thereby ameliorate immune responses to various opportunistic infections, as well as boost viral control in a functional HIV cure approach.

103 High level of short-chain fatty acids has direct effects on the barrier function of cervicovaginal epithelial cell lines

Abu Bakar Siddik[1]
[1]University Of Manitoba, Winnipeg, Canada, [2]J C Wilt Infectious Diseases Research Center, Public Health Agency of Canada., WINNIPEG, Canada

Short-chain fatty acids (SCFAs) are microbial-derived metabolites that enter the circulation. SCFAs are reported to maintain the gut mucosal barrier and regulate the inflammation of gut mucosa. Paradoxically, at vaginal mucosa, high level of SCFAs is associated with bacterial vaginosis (BV) and vaginal inflammation.

Since the cervicovaginal epithelial barrier function and vaginal mucosal inflammation are critical for the susceptibility to HIV and HPV infection, this study focuses on deciphering the relationship between vaginal SCFAs and inflammatory cytokine/chemokine levels in cervicovaginal fluid (CVF) and defining the direct effects of SCFAs on cervicovaginal epithelial integrity.

The CVF samples from healthy (n=27) and HPV-infected non-menopausal women with low-grade squamous intraepithelial lesions (LSIL) (n=14) were analyzed for SCFAs and 18 inflammatory cytokine/chemokine. HPV DNA in the vaginal samples was detected by PCR.
Vaginal SCFAs detected were acetate (0.16-2.8mM), butyrate (0.35-41.9µM), propionate (0.23-67.0µM), beta-hydroxybutyrate (0.1-43.4µM), and valerate (0.02-0.6µM).

Unexpectedly, the SCFAs levels in LSIL-HPV CVF were not different from the controls. We further found that levels of vaginal SCFAs were significantly higher than plasma SCFAs (p-values <0.01).

Furthermore, the LSIL-HPV CVF and the HPV-negative control CVF had similar levels of pro-inflammatory cytokine/chemokine. In vitro study showed that treatment of polarized, multilayered cervicovaginal epithelium with sodium butyrate (5mM) or propionate (5mM) for 48 hours resulted in increased epithelial permeability, with reduced trans-epithelial electrical resistance across the epithelium.

Taken together, SCFA levels are similar in the CVF of the LSIL-HPV and the HPV negative participants. It's perhaps, due to the similar status of low vaginal inflammation in both groups of participants; it agrees with the similar levels of cytokine/chemokine in the CVF from both groups. We provide evidence that high level of SCFAs could directly impair the cervical-vaginal epithelial barrier integrity. Work is ongoing to validate this observation in the primary epithelium.

114 One pill to control them all: Identification of the thiazole-5-carboxamide GPS491 as an inhibitor of HIV-1, adenovirus, and coronavirus replication

Subha Dahal[1], Ran Cheng[1], Peter Cheung[2], Terek Been[1], Ramy Malty[1], Melissa Geng[1], Sarah Manianis[1], Lulzim Shkreta[4], Shahrazad Jahanshahi[1], Johanne Toutant[4], Rose Chan[1], Sean Park[1], Mark Brockman[5], Mohan Babu[3], Samira Mubareka[1], Karen Mossman[6], Arinjay Banerjee[6], Scott Gray-Owen[1], Martha Brown[1], Walid Houry[1], Benoit Chabot[4], David Grierson[7], **Alan Cochrane[1]**

[1]University of Toronto, Toronto, Canada, [2]British Columbia Centre for Excellence in HIV/AIDS, Vancouver, Canada, [3]University of Regina, Regina, Canada, [4]Université de Sherbrooke, Sherbrooke, Canada, [5]Simon Fraser University, Burnaby, Canada, [6]McMaster University, Hamilton, Canada, [7]University of British Columbia, Vancouver, Canada

Most current antivirals target discrete stages in the virus replication cycle (entry, genome replication, proteolytic cleavage of viral proteins) by inhibiting the activity of virus-encoded proteins or their interactions with host cell machinery.

However, as obligate parasites, viruses are dependent upon a common subset of host cell processes for their replication. Consequently, altering the ability of a virus to effectively use a host cell process may provide an alternative strategy to impede virus replication, generating a more robust barrier to virus resistance, and affect a broader spectrum of viruses with a single agent. Medicinal chemistry optimization of a previously described stilbene inhibitor of HIV-1, 5350150 (2-(2-(5-nitro-2-thienylvinylquinoline), led to the identification of the thiazole-5-carboxamide derivative (GPS491) which retained potent anti-HIV-1 activity with reduced toxicity.

In this report, we demonstrate that the block of HIV-1 replication by GPS491 is accompanied by a drastic inhibition of viral gene expression (IC50 ~0.25 µM), and alterations in the production of unspliced, singly-spliced and multiply spliced HIV-1 RNAs. GPS491 also inhibited the replication of adenovirus and multiple coronaviruses. Low µM doses of GPS491 reduced adenovirus infectious yield ~1000 fold, altered virus early gene expression/viral E1A RNA processing, blocked viral DNA amplification, and inhibited late (hexon) gene expression.

Loss of replication of multiple coronaviruses (229E, OC43, SARS-CoV2) upon GPS491 addition was associated with the inhibition of viral structural protein expression and the formation of virus particles.

Consistent with the observed changes in viral RNA processing, GPS491 treatment induced selective alterations in the accumulation/phosphorylation/function of splicing regulatory SR proteins. Our study establishes that a compound which impacts the activity of cellular factors involved in RNA processing can prevent the replication of several viruses with minimal effect on cell viability.

116 Impact on Inflammatory and Atherogenesis Biomarkers with the 2-Drug Regimen Dolutegravir Plus Lamivudine in Treatment-Experienced People With HIV-1: A Systematic Literature Review

Josep Llibre[1], Pedro Cahn[2], Janet Lo[3], Tristan Barber[4,5], Cristina Mussini[6], Berend Van Welzen[7], Beatriz Hernandez[8], Cynthia Donovan[9], Michelle Kisare[10], Myooran Sithamparanathan[11], Jean van Wyk[11], **Cynthia Torresilla[12]**

[1]Hospital Universitari Germans Trias i Pujol, Barcelona, Spain, [2]Fundación Huésped, Buenos Aires, Argentina, [3]Massachusetts General Hospital, Harvard Medical School, Boston, United States, [4]Royal Free London NHS Foundation Trust, London, United Kingdom, [5]University College London, London, United Kingdom, [6]AOU Policlinico, University of Modena and Reggio Emilia, Modena, Italy, [7]University Medical Centre Utrecht, Utrecht, The Netherlands, [8]ViiV Healthcare, Madrid, Spain, [9]ViiV Healthcare, Research Triangle Park, United States, [10]GlaxoSmithKline, Nairobi, Kenya, [11]ViiV Healthcare, Brentford, United Kingdom, [12]ViiV Healthcare, Laval, Canada

Introduction: Even with sustained antiretroviral therapy (ART)-mediated virologic suppression, HIV is associated with some persistent inflammation, increasing risk of comorbidities. The 2-drug regimen dolutegravir (DTG) plus lamivudine (3TC) has demonstrated durable, non-inferior efficacy compared with 3- and 4-drug regimens (3/4DRs) in ART-naive and ART-experienced people with HIV-1 (PWH).

Objectives: This systematic review summarized randomized controlled trial (RCT) and real-world evidence evaluating inflammatory and atherogenesis biomarkers with DTG + 3TC in ART-experienced PWH.
Materials and Methods: Ovid MEDLINE®, Embase®, PubMed, and Cochrane library databases were searched for studies published from January 1, 2013, to July 14, 2021. Relevant data from the 2021 International AIDS Society (IAS) Conference on HIV Science and IDWeek™ 2021 were also retrieved. Eligible studies included real-world evidence and RCTs evaluating switch to DTG + 3TC in ART-experienced PWH aged ≥18 years with data on CD4+/CD8+ ratio or inflammatory and atherogenesis biomarkers.

Results: Overall, 4 publications representing 2 RCTs (DTG/3TC: SALSA, n=246; TANGO, n=369) and 6 publications of real-world evidence (DTG + 3TC: N=1000) were included. Across RCTs, no consistent pattern of change in biomarkers was observed between DTG/3TC and 3/4DR comparators, except for reduced soluble CD14 (favored DTG/3TC in SALSA at Week 48 and TANGO at Weeks 48 and 144; $P<0.05$) and IL-6 (favored TAF-based regimens in TANGO at Weeks 48 and 144; $P<0.05$). In the one real-world study evaluating changes in inflammatory biomarkers (N=67), median soluble CD14 levels significantly decreased at Week 48 post-DTG + 3TC switch ($P<0.001$). Levels of other biomarkers (including IL-6) remained stable. In all 6 real-world studies, CD4+/CD8+ ratio increased post-switch to DTG + 3TC (follow-up, 12-60 months).

Conclusion: Results showed no consistent impact on inflammatory and atherogenesis biomarkers post-switch to DTG + 3TC vs 3/4DR comparators, suggesting no evidence of an impact on inflammation after switching from a 3/4DR to DTG/3TC.

119 Localization of MxB to the centrosome: implication in its anti-HIV-1 activity

Yishi Lin[1], **Zhen Wang[1]**, Chen Liang[1]
[1]Lady Davis Institute, Jewish General Hospital, Montréal, Canada

Human myxovirus resistance protein B (MxB, also known as Mx2) is a dynamin-like GTPase. Its expression is inducible by type I interferon. Multiple RNA viruses, including human immunodeficiency virus type 1 (HIV-1) and hepatitis C virus, and DNA viruses such as herpesviruses and hepatitis B virus have been shown to be restricted by MxB. MxB exhibits a signature localization to the nuclear pore complex (NPC) on the nuclear envelope, which is associated with its antiviral function. Yet, it remains unclear how MxB is anchored to the NPC.

During mitosis, with nuclear envelope breakdown, NPC also dissociates, and many of its components are distributed to various subcellular locations. We hypothesize that monitoring the distribution of MxB during mitosis by confocal imaging may provide insights on which NPC components MxB associates with.

To test this, we employed the CRISPR-Cas9 technology to generate MxB-RFP knock-in HeLa cell clones which can be used to track the distribution of endogenous MxB during mitosis by live-cell imaging. At interphase, MxB-RFP was observed at the nuclear envelope. When cells divide and the nuclear envelope breaks down, MxB forms small granules instead of complete dispersal.

At metaphase, when chromosomes are aligned at the equatorial plate, MxB forms two patches that are co-localized with the centrosome markers Aurora A and γ-tubulin.

We are investigating which NPC proteins (nucleoporins) are also localized to the centrosome, how MxB affects the function of the centrosome as a microtubule-organizing center, and what is the potential impact of MxB on the trafficking of viral DNA along microtubules.

143 Effect of Dolutegravir on Glucose Homeostasis in Female Mice

Valeriya Dontsova[1], Haneesha Mohan[2], Caroline Dunk[2], Jennifer Jao[3], Rebecca Zash[4], Nicholas Greene[5], Andrew Copp[5], Lena Serghides[2]
[1]University Of Toronto, Toronto, Canada, [2]University Health Network, Toronto, Canada, [3]Northwestern University, Chicago, United States, [4]Beth Israel Deaconess Medical Center, Boston, United States, [5]University College London, London, United Kingdom

Background: Dolutegravir (DTG) has been associated with a small increased risk of neural tube defects (NTDs) as well as weight gain and hyperglycemia. We evaluated the impact of DTG on glucose homeostasis using a mouse model.

Methods: Healthy euglycemic female C57BL/6 mice were randomly assigned to daily treatment with either control (water, N=15), 1xDTG (2.5mg/kg DTG+33.3/50mg/kg emtricitabine (E)/tenofovir disoproxil fumarate (T), N=13), yielding therapeutic levels of DTG, or 5xDTG (12.5mg/kg+33.3/50mg/kg E/T, N=15) for 8 weeks. Overnight fasted glucose, body weight, and oral glucose tolerance test (OGTT) were measured at 2, 4, 6 and 8 weeks. Fasting hyperglycemia was defined as fasting glucose >10mmol/L. Secondary outcomes included severe fasting hyperglycemia of >13.3mmol/L and OGTT glucose concentrations area under the curve (AUC). Mice were sacrificed at 9 weeks, and tissues were collected for gene expression of factors in glucose homeostasis pathways.

Results: No differences were observed in weight gain between groups. By week 6, 1xDTG animals displayed a significant increase in overnight fasted glucose. 16 of 28 animals treated with DTG (8 in 1x-DTG, 8 in 5x-DTG) had fasting hyperglycemia at least once, compared to only 1 in the control. Of the 16 DTG-treated mice, 3 had severe fasting hyperglycemia, 11 had fasting hyperglycemia at 6 weeks, and 10 returned to being euglycemic by week 8. Mice developing fasting hyperglycemia also showed higher OGTT AUC compared to controls. DTG-treated animals that remained euglycemic had a modest downregulation of hepatic genes associated with gluconeogenesis compared to controls, including glucose-6-phosphatase, phosphoenolpyruvate-carboxykinase, and PPAR-α.

Conclusions: DTG was associated with transient glucose dysregulation in some, but not all, animals. If further research shows DTG is associated with transient hyperglycemia in humans, this may partially explain the increase in NTDs seen after the rollout of DTG in Botswana, as hyperglycemia is a known risk factor for NTDs.

166 Effects of HIV-infection and Smoking on Pulmonary Mucosal Tissue-resident CD8 T-Cell Dynamics in Era of Antiretroviral Therapy

Yulia Alexandrova[1,2,3], Alexis Yero Diaz[2], Ron Olivenstein[4], Marianna Orlova[1], Erwin Schurr[1,5], Cecilia Costiniuk[1,2,6], Mohammad Ali Jenabian[2]
[1]Infectious Diseases and Immunity in Global Health Program, Research Institute of McGill University Health Centre, Montreal, Canada, [2]Department of Biological Sciences, Université du Québec à Montréal, Montreal, Canada, [3]Department of Microbiology and Immunology, McGill University, Montreal, Canada, [4]Division of Respirology, Department of Medicine, McGill University, Montreal, Canada, [5]Department of Human Genetics, McGill University, Montreal, Canada, [6]Division of Infectious Diseases and Chronic Viral Illness Service, McGill University Health Centre, Montreal, Canada

Background: Despite the success of antiretroviral therapy (ART), people living with HIV (PLWH) suffer from a high burden of infectious and non-infectious pulmonary diseases, suggesting that their lung immunity is not fully restored. Cytotoxic CD8 T-cells are essential in controlling chronic viral infections. However, inappropriate and excessive CD8 T-cell activation during HIV infection can have serious adverse effects associated with lung mucosal tissue damage. Furthermore, while tobacco smoking is part of the lifestyle of many Canadians, this changes the lung environment and promotes pulmonary inflammation. We thus aimed to characterize the effects of HIV and smoking on tissue-resident memory (Trm) CD8 T-cell dynamics in the human lung.

Methods: Bronchoalveolar lavage (BAL) fluid and matched blood were obtained from asymptomatic ART-treated (median undetectable viral load: 8 years) HIV+ smokers and non-smokers and uninfected smokers and non-smokers (n=6 per study group). Lymphocytes were isolated for flow cytometric analysis.

Results: Both smoking and positive HIV status were independently associated with significantly higher total CD8 T-cell frequencies in BAL. Two distinct CD8 Trm subsets were observed based on CD103 expression (CD103+CD69+CD49a+, CD103-CD69+CD49a+). Furthermore, smoking, but not HIV status, was associated with higher CD103+CD8 Trm within different study groups. Chronic HIV infection was also associated with higher frequencies of CD8 non-Trm (CD103-CD69-CD49a) co-expressing KLRG1/CX3CR1, suggesting increased CD8 T-cell infiltration from the circulation into the lung mucosa. Moreover, CD8 T-cells from HIV+ versus HIV- study participants displayed higher levels of cytotoxic effector molecules granzymes A and B.

Conclusions: Despite long-term ART, chronic pulmonary inflammation caused by HIV infection may dysregulate mucosal CD8 T-cell cytolytic functions and cause infiltration of pro-inflammatory CD8 T-cells into the lung mucosa. Smoking could promote CD8 T-cell retention in the lung via upregulation of CD103 on these cells.

175 Genetic Regulation of Gene Expression in HIV+ T Cells and Monocytes Associated With Control of HIV

Riley Tough[1,2], Shanelle Gingras[1,2], David Tang[2], Jeffrey Tuff[2], Catherine Card[2], Paul McLaren[1,2]
[1]Department of Medical Microbiology and Infectious Diseases, University Of Manitoba, Winnipeg, Canada, [2]National HIV and Retrovirology Laboratory, Public Health Agency of Canada, Winnipeg, Canada

Despite African populations having the largest burden of HIV disease, the majority of large-scale HIV host genetic studies have been in European populations.

To address this gap, our lab conducted a genome-wide association study of HIV set-point viral load (spVL), a strong indicator of disease progression with a known host genetic component, in >3,800 individuals of African ancestry.

We detected a novel region of chromosome 1 significantly associated with decreased HIV spVL. Variants in high linkage disequilibrium (R2 ≥ 0.6) with the top SNP, rs59784663 (p= 6.4E-10, β = -0.3), overlap three coding genes: CHD1L, PRKAB2, and FMO5, none of which have been previously implicated in HIV pathogenesis.

Statistical fine-mapping of the chromosome 1 region revealed that two non-coding variants, rs73004025 and rs7519713, provide a significantly better model than the top SNP alone (two-way ANOVA, $p < 0.01$) and functional assessment suggests these variants may impact gene expression.

To test for differences in gene expression, cryopreserved PBMCs from HIV+ individuals (N=24) with different genotypes at the top associated SNP were sorted into CD4+ T cell and monocyte fractions.

The CD4+ T cell fraction was divided into an unstimulated and stimulated (CD3/CD28 for 8 hours) fraction before RNA collection. Due to low cell numbers, RNA was collected only from unstimulated monocytes. Gene expression of CHD1L, PRKAB2, and FMO5 was measured using Taqman RT-qPCR assays with TBP, RPL13A, and SDHA as CD4+ T cell housekeeping genes, and in monocytes, HPRT1 and SDHA. We observed no significant differences or trends in expression of PRKAB2 or FMO5, but a trend towards lower CHD1L expression in individuals carrying the variant allele in stimulated CD4+ T cells and unstimulated monocytes.

Ongoing work will increase the sample size of individuals carrying the reference and alternate alleles to increase the power of detecting significant differences.

178 Reversal of a Latency-Like Phenotype Using The Small Antigen of the Hepatitis Delta Virus, A Counterintuitive Way to Activate Latent HIV Infected Cells

Marilyn Whelan[1,2], Marc-André Langlois[1,2], Martin Pelchat[1,2]
[1]Department of Biochemistry, Microbiology and Immunology, Faculty of Medicine, University of Ottawa, Ottawa, Canada, [2]uOttawa Center for Infection, Immunity and Inflammation (CI3), Ottawa, Canada

Association of NELF with RNAPII induces a transcriptional pause shortly after promoter clearance, an important step in the regulation of gene expression. This promoter-proximal pause is also important for the pathogenesis of the human immunodeficiency virus (HIV).

In the context of an active infection, the viral transactivator of transcription (Tat) protein stimulates viral transcription elongation by recruiting P-TEFb, effectively overcoming the promoter-proximal pause. One mechanism for HIV latency can involve low levels of Tat in the infected cell that results in inefficient recruitment of P-TEFb to the paused RNAPII. This leads to a prolonged promoter-proximal pause on the provirus and entry of the provirus into transcriptionally latent state.

These latently infected cells create viral reservoirs, which are not targeted by T cell responses or antiretroviral drugs due to minimal viral RNA transcription and protein translation. Therefore, latently infected cells remain hidden until transcription of the provirus is induced.

The hepatitis delta small antigen (HDAg-S), one of the two proteins produced by the hepatitis delta virus (HDV), stimulates RNAPII processivity during HDV transcription and is thought to do so by competing with NELF for a common binding site on RNAPII.

The aim of this study is to evaluate the anti-latency potential of inhibiting the RNAPII pausing using a NELF competitor such as HDAg-S. As the promoter-proximal pause is one of the mechanisms through which HIV becomes latent, using a NELF competitor could lead to transcriptional reactivation of latently infected cells. We report that HDAg-S stimulates transcription of latent HIV provirus mutants in infected cell lines. Interestingly, our results hint at a synergistic relationship between Tat and HDAg-S, one in which HDAg-S kickstarts viral transcription, inducing a positive feedback loop that stimulates Tat production. These results demonstrate the anti-latency potential of inhibiting the promoter-proximal pause using a NELF competitor.

192 Understanding the Viral and Host Transmission Fitness Factors Associated with Different Modes of HIV-1 Subtype B Transmission

Yiying Zhang[1]
[1]*Western University, London, Canada*

Human immunodeficiency virus-1 (HIV-1) is the main cause of acquired immunodeficiency syndrome (AIDS) and is transmitted by contact with infected fluids, including genital secretions (during sex) or blood. As a result, HIV-risk groups include heterosexual individuals (HET), men-who-have-sex-with-men (MSM), people who inject drugs (PWID) and people who received contaminated blood transfusions (CBT).

When HIV-1 is transmitted, typically only a single clone or in rare cases a few HIV-1 clones establish the new infection, representing a transmission bottleneck for the virus. The viral clone that establishes infection is called transmitted/founder (T/F) virus. The phenomenon is especially outstanding in HET and MSM transmission while less stringent in transmission from blood contact (PWID and CBT). Specific traits that allow for successful transmission have not been identified clearly.

This project determined the transmission fitness between T/F viruses from different transmission routes by using in vitro competition and then analyzed the contribution of possible factors by using a series of phenotypic assays. We found that T/F viruses from HET and MSM often outcompete T/F viruses from PWID during in vitro competitions on T helper type 1 cell line while PWID will dominate the infection on T helper type 17 cell line.

When it comes to phenotypic factors, T/F viruses require more stringent cellular co-receptor conformation to enter susceptible cells compared with chronic viruses, especially viruses from HET. Furthermore, T/F viruses across all transmission modes show faster cell entry speed than that of chronic viruses.

This project will establish key viral phenotypes contributing the successful virus transmission and entry and will contribute to the design of a robust and protective anti-HIV vaccine.

193 Pro-survival Protein BCL-2 Inhibitor in Combination with a Latency Reversal Agent to Eliminate Latent HIV-Infected Cells

Sharmin Begum[1], Tram NQ Pham[1,2], Eric A Cohen[1,2]
[1]Montreal Clinical Research Institute (ircm), Montreal, Canada, [2]Departement of Microbiology, Infectiology and Immunology, Université de Montréal, Montreal, Canada

Though antiretroviral therapy (ART) suppresses HIV replication, it is not able to eradicate virus-infected long-lived cells harboring integrated latent HIV proviruses known as “viral reservoir (VR)”. One important mechanism contributing to the survival and persistence of these VR is their capacity to prevent cell death from host immune effectors such as CD8+ cytotoxic T lymphocytes (CTLs). Latency reversing agents (LRA) can reactivate latent virus to enhance their immune recognition but are inefficient at sensitizing reactivated cells to death.

Recent evidence reveals that latent HIV infected cells have an intrinsic resistance to cell death responses modulated by the pro-survival protein BCL-2. Transcriptomic analysis of CTL-resistant CD4+ T cells revealed BCL-2 upregulation is one of the strategies exploit by the virus to prolong latent cell survival. Previously, we showed that a novel bivalent SMAC mimetic (SM)) is an effective LRA, which reactivates latently infected CD4+ T cells but induces a modest reduction of VR in humanized mice. As HIV-infected cells also upregulate BCL-2 expression, the ability of these compounds to sensitize VR to cell death remains limited.

Here-in, using established HIV infection models, we demonstrate a novel approach to augment the cell death and elimination of latently HIV infected cells with BCL-2 inhibitor alone and/or in combination with SM treatment.

Our results reveal that BCL-2 inhibitor alone is not sufficient to drive reactivation of latently HIV infected cells but showed a selective toxicity to latently HIV infected cells. Importantly, combination of SM treatment followed by BCL-2 inhibition show an additive effect in the reduction of latently infected cells via the activation of apoptotic cell death.

Overall, these results provide the rationale to evaluate the therapeutic potential of combining LRAs with pro-survival protein antagonists in the context of VR elimination strategies in humanized mice preclinical models.

195 HIV prevention by inducing immune quiescence using low-dose aspirin: potential involvement of the lipoxygenase pathway?

Monika M Kowatsch[1], Tanja Winter[2], Julius Oyugi[1,3], Joshua Kimani[1,3,4], Harold M Aukema[2], Julie Lajoie[1,3], Keith R Fowke[1,3,4]
[1]University Of Manitoba, Winnipeg, Canada, [2]St. Boniface Hospital Research, Winnipeg, Canada, [3]University of Nairobi, Nairobi, Kenya, [4]Partners for Health and Development in Africa, Nairobi, Kenya

Background: Globally 1.5 million new HIV infections occurred in 2020, 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 to reduce FGT HIV target cells using safe, affordable, and globally available anti-inflammatory: acetylsalicylic acid (ASA/Aspirin). We found ASA decreased the proportion of FGT HIV target cells (CD4+CDCR5+Tcells) by 35%. However, the mechanism remains unknown.
Goal: To assess if ASA use reduces mediators of inflammatory pathways such as the lipoxygenase pathway.

Methods: Women from Nairobi, Kenya took low dose ASA (81mg) daily for 6 weeks. Blood was drawn at baseline and following 6 weeks daily ASA. Plasma was frozen at -80˚C and shipped to Winnipeg, Canada. Oxylipins in the plasma were stabilized with antioxidants, spiked with an internal standard, extracted on Strata-X-SPE columns and quantified using liquid chromatography mass spectroscopy. Oxylipins from 12 possible pathways were assessed.

Results: All detected cyclooxygenase metabolites from arachidonic acid were downregulated, 4/6 statistically significantly so. We detected at least one metabolite from 9 of the 12 possible oxylipin pathways, 4 pathways had more than one analyte significantly different following 6 weeks ASA. Interestingly, the majority of lipoxygenase metabolites from all 4 pathways were significantly downregulated: 5/13 from arachidonic acid, 2/10 from docosahexaenoic acid, 2/6 linoleic acid, and 2/2 from dihomo-γ-linoleic acid.

Conclusion/Discussion: We show that the following 6 weeks of ASA treatment, metabolites from both the lipoxygenase and cyclooxygenase pathways were down regulated. While ASA directly inhibits cyclooxygenase function, this is not the case for lipoxygenase. However, inflammation increases lipoxygenase expression and ASA reduced inflammation in our cohort. We speculate that ASA-associated reduction in inflammation, decreased lipoxygenase expression resulting in decreased lipoxygenase metabolites.

197 Paroxetine Intersects with the PKC Pathway and Attenuates the Reactivation of HIV-1 from Latency

Ana Luiza Abdalla[1], Paola Guizar[1], Anne Monette[1], Meijuan Niu[1], Andrew Mouland[1]
[1]*Mcgill University, Montreal, Canada*

The major barrier in achieving an HIV-1 cure is the rapid establishment of latent infection. One strategy to target latently infected cells in a cure strategy is to induce a deep latency, avoiding virus rebound when anti-retroviral therapy (ART) is removed.

Several lines of evidence now show in latently-infected cells that the mTORC1 complex, a master regulator of autophagy, a major metabolic process that maintains host cell physiology, severely restricts the reactivation of HIV-1.

In this work we hypothesized that the induction of autophagy will induce a deep latency and suppress the reactivation of HIV-1 from latently-infected CD4+ T cells. Our experimental procedures consist of treating latently infected cells (GFP expressing J-lat 10.6 cells) with FDA-approved autophagy-inducing drugs (i.e., anti-depressants such as paroxetine, promethazine, trimipramine) and then reactivating cells using a selection of latency-reversing agents (LRAs), followed by the evaluation of levels of the provirus using GFP expression as a readout by flow cytometry.

RESULTS: The autophagy-inducing drug, paroxetine, attenuated virus reactivation 2.3-fold using PMA and prostratin as the LRAs ($p=0.0091$, t-test), but not with TNF-α and SAHA, that lead to reactivation of proviral DNA through other mechanisms. These data suggest that paroxetine intersects with the PKC pathway to modulate virus reactivation. Although we show that paroxetine induces autophagy in these cells, further work will allow us to determine if the block to latency reversal we observe is achieved via this mechanism.

Considering that the dysregulation of autophagy influences both the pathological presentation of HIV-1-associated neurodegenerative disease and reactivation from latency, this work has the potential to inform on therapeutics for HAND and functional cure strategies by repurposing FDA-approved drugs for HIV-1.

202 Distinct effects of two different interferon-alpha subtypes on HIV-1 associated T cell hyperactivation and dysfunction

Saurav Rout[1], Yunyun Di[1], Kathrin Sutter[2], Ulf Dittmer[2], Kerry Lavender[1]
[1]University Of Saskatchewan, Saskatoon, Canada, [2]Institute of Virology, University of Duisburg-Essen, Essen, Germany

Interferon-alpha (IFN-α) has been associated with excessive immune activation and dysfunction during HIV-1 infection. However, evidence suggests specific IFN-α subtypes may be beneficial rather than detrimental.

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 have been associated with CD8+ T cell hyperactivation and dysfunction in HIV-1 patients.

Our previous study with the IFN-α14 subtype suggested that some IFN-α subtypes may be beneficial during HIV-1 infection. This study compared the effects of treatment with two different IFN-α subtypes on indicators of T-cell activation and dysfunction during HIV-1 infection. Using HIV-1-infected TKO-BLT humanized mice, we demonstrated that after 3 weeks of treatment, IFN-α14 had significantly reduced viremia and markers of CD8+ T cell-related dysfunction such as hyperactivation, exhaustion and apoptosis comparable to healthy controls and unlike anti-retroviral therapy (ART), low levels of these markers were maintained even after the treatment was withdrawn.

Mice treated with IFN-α14 had a greater Tnaïve/Teffector memory ratio of 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 treatment 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. In addition, IFN-α14 treatment did not alter the CD4+ T cell count supporting the hypothesis that IFN-α14 treatment does not exacerbate HIV-1 disease progression and may have therapeutic potential to alleviate CD8+ T cell dysfunction during HIV-1 infection.

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226 Investigating HIV Epidemiology and Drug Resistance in Ghana

Anna Appah[1,2], Charlotte Beelen[2], Don Kirkby[2], Winnie Dong[2], Chanson Brumme[2,3], Vincent Ganu[5], Linda Eva Amoah[6], Peter Puplampu[5], Nicholas Isreal Trebi[4], Zabrina Brumme[1,2]
[1]Faculty of Health Sciences, Simon Fraser University, Burnaby, Canada, [2]British Columbia Centre for Excellence in HIV/AIDS, Vancouver, Canada, [3]University of British Columbia, Department of Medicine, Vancouver, Canada, [4]Department of Medical Laboratory Sciences, School of Biomedical and Allied Health Sciences,, ACCRA, GHANA, [5]Department of Medicine, University of Ghana Medical School, & Korle Bu Teaching Hospital, ACCRA, GHANA, [6]Immunology Department, Noguchi Memorial Institute for Medical Research, University of Ghana,, ACCRA, GHANA

Background: Accurate information on HIV diversity, subtype distribution and drug resistance is critical to guide HIV treatment and curative strategies in resource limited settings. In West African, Ghana, highly diverse HIV strains, including complex recombinants, co-circulate, but the full extent of this diversity is incompletely understood. A well-organized government sponsored HIV/AIDS treatment in Ghana began in the year 2003 with the most recent WHO-compliant Ghanaian HIV drug resistance survey occurring between 2004-2013. Towards addressing these gaps, we are characterizing plasma HIV Protease/Reverse Transcriptase and Integrase sequences in Ghanaian participants, as well as full-genome HIV sequences where possible, to better understand the transmitted/acquired drug resistance mutation burden and molecular epidemiology of HIV in the region.

Methods: We used nested RT-PCR and a combination of Sanger and Illumina sequencing to characterize HIV sequences from a preliminary set of 55 plasma samples from Ghanaian participants aged 16 and over. Forty-eight persons (87%) were treatment naive at time of sample collection, while 7 persons (13%) had discontinued therapy.

Results: To date, Protease/Reverse Transcriptase and Integrase sequencing was successful for 47 (85%) and 35 (64%) samples, respectively. Of these, 14 participants, including 9 treatment-naïve, 3 treatment-experienced participants and 2 persons whose treatment history was unknown, respectively, harbored at least one drug resistance mutation. The major NNRTI-resistance mutations RT-K103N (n=2), RT-K101E (n=1) and RT-Y188L (n=1) were observed. Whole genome sequences, available for 25 participants to date, revealed 11 (44%) CRF02_AG, one (4%) complex recombinant form 06_cpx, 2 (8%) putative novel recombinants comprised of CRF02_AG and subtype A1, and 11 putative complex recombinants comprising at least 3 subtypes.

Conclusions: Our observations are consistent with extensive HIV diversity in Ghana, which facilitates the ongoing creation of new complex recombinant forms. Study findings will improve understanding of the Molecular Epidemiology of HIV and drug resistance mutation prevalence, in Ghana.

229 Bayroot: A Bayesian Phylogenetic Approach to Dating HIV Reservoir Sequences

Roux-cil Ferreira[1], Art Poon[1]
[1]*University of Western Ontario, London, Canada*

Integrated HIV-1 provirus in latently-infected cells represent the main barrier to an effective cure. The time of HIV-1 DNA integration (provirus 'age') may influence susceptibility to immune-mediated or therapeutic eradication strategies. Provirus ages can be estimated by root-to-tip regression (RTT). However, this approach relies on weak assumptions about uncertainty and variation in sequence divergence.

We obtained published HIV-1 (n=518 pre-treatment RNA and n=879 post-treatment DNA) sequences spanning vpu-env-nef from 13 seroconverters in the Zambia-Emory HIV Research Project. After screening for hypermutation, we reconstructed phylogenies with RAxML and then regressed root-to-tip distances to sampling dates for RNA sequences to root the trees.

By this method, DNA sequences are dated by mapping root-to-tip distances to the regression line. In other words, it assumes that every HIV-1 sequence integrating at date T carries exactly Y mutations from the root. Our approach samples the location of the root, x-intercept (date of infection) and slope (rate of evolution) from a posterior distribution defined by a Poisson model of mutation accumulation. This Bayesian approach (bayroot) incorporates uncertainty in estimating these parameters from limited data, and allows proviral sequences to be mapped to a range of dates.

We applied both methods to date 437 HIV-1 DNA sequences. We observed significantly more variation among date estimates from RTT than bayroot, which we attribute to the fact that RTT does not account for uncertainty in locating the root or variation in the number of mutations. While including these factors in the Bayesian analysis increases model flexibility, however, they reduce variation in age estimates among DNA sequences, implying that there is insufficient information to differentiate among integration dates.

233 High Frequencies of Adaptive NK Cells are Associated with Absent Coronary Plaque in Cytomegalovirus Infected People Living with HIV Enrolled in the Canadian HIV and Aging Cohort Study (CHACS)

Khlood Alsulami[1], Manel Sadouni[4], Daniel Tremblay-Scher[4], Jean Gut Baril[5], Benoit Trottier[5], Franck P. Dupuy[1,3], Carl Chartrand Lefebvre[4,5], Cécile Tremblay[4,7], Madeleine Durand[4,7], Nicole F. Bernard[1,2,3], The Canadian HIV and Aging Cohort Study

[1]Mcgill university, Montreal, Canada, [2]Division of Experimental Medicine, Montreal, Canada, [3]Infectious Diseases, Immunology and Global Health Program, Montreal, Canada, [4]Centre de Recherche du Centre Hospitalier de l'Université de Montréal (CRCHUM, Montreal, Canada, [5]Clinique de Médecine Urbaine du Quartier Latin, Montreal, Canada, [6]Département de Radiologie, Radio-oncologie et Médecine Nucléaire, Montreal, Canada, [7]Département de Microbiologie, Infectiologie et Immunologie, Montreal, Canada, [8]Division of Clinical Immunology, McGill University Health Centre, Montreal, Canada

Background: People living with HIV (PLWH) develop cardiovascular disease (CVD) at higher rates than age-matched uninfected persons. Aside from classic risk factors for CVD, co-infection with cytomegalovirus (CMV) may have a substantial effect on the progression of atherosclerosis and cardiovascular risk. CMV infection drives the expansion of NKG2C+CD57+ adaptive NK (adapNK) cells with memory-like properties. We questioned whether the frequency of these cells was associated subclinical atherosclerosis.

Methods: 194 participants aged ≥40 yrs enrolled in the CHACS were included, (n=128 CMV+PLWH, 8 CMV-PLWH, 37 CMV mono-infected and 21 double negatives). All underwent coronary angiography by computed tomography, and total coronary plaque volume (TPV) was obtained. All were free of overt CVD. All PLWH were on-ART for a mean duration of 15 yrs. Subclinical atherosclerosis was defined as absent if TPV=0, and as present if TPV>0. We categorized NKG2C+CD57+ adapNK cells frequency as low if <4.5%, intermediate if between 4.6% and 20% and high if >20%.

Results: The frequency of NKG2C+CD57+ adapNK cells was higher in CMV+ (16.3 [6.6-36.7]) than CMV- participants (2.5 [0.9-3.0]), (p<0.0001, Mann Whitney tests). A greater proportion of CMV+PLWH with high adapNK cell frequencies had absence versus presence of subclinical atherosclerosis [61.90% versus 39.53%, p=0.03, Chi-square test) with a similar trend in CMV mono-infected participants [46.15% versus 34.78%]. In an independent Poisson regression analysis, after adjusting for classic cardiovascular risk factors, CMV+ persons with high adapNK cell frequencies had a relative risk (RR) for the absence of coronary artery atherosclerosis of 0.75 (95% CI, 0.58-0.97, p= 0.03). Increasing age and smoking intensity increased the RR for atherosclerosis. HIV infection had no effect on the RR of atherosclerosis (RR, 1.08, 0.81-1.42, p= 0.58).

Conclusion: High frequencies of NKG2C+CD57+ adapNK cells are associated with a reduced risk of atherosclerosis in CMV+PLWH and CMV mono-infected individual.

235 Memory CD4 T cells from The Liver Are Infected During SIV Infection in Rhesus Macaques

Julien Clain[1], **Juliette Dewatines[1]**, Henintsoa Rabezanahary[1], Gina Racine[1], Ouafa Zghidi-Abouzid[1], Jérôme Estaquier[1]
[1]Centre de Recherche en Infectiologie du CHU de Québec, Université Laval, Québec, Canada

Despite the introduction of highly active antiretroviral therapy, HIV infection continues to be a major global public health issue as a chronic disease. The liver has been shown to be an HIV-infected organ causing liver disease and co-morbidity in HIV-infected individuals. We have established a model of Rhesus Macaque infected with SIV, taking the opportunity to analyze more in deep the nature of infected cells in the liver. Herein, we specifically assessed the role of CD4+ T cells.

Rhesus Macaques (RMs) were infected with the SIVmac251 (20 AID50). RMs were sacrificed at different times post-infection and cells from the liver were recovered. CD4+ T cells were stained with specific antibodies and analyzed by flow cytometry. Cell sorting was used to isolate CD4 T cells and to quantify the frequency of viral DNA and RNA.

First, we observed that the frequency of CD4 T cells was lower in SIV-infected RMs (12%) in comparison to healthy RMs (31%). After cell staining, we found that more than 40% of CD4 T cells expressed CCR5, a chemokine receptor used by SIV to infect the cells, in comparison to 8% in the blood. The majority of these cells are memory CD4 T cells (CD45RAneg and CD62Lneg). The phenotype of these cells indicated a specific phenotype of CD4 liver cells and not only a contamination from blood CD4 T cells. After cell sorting, we found that liver CD4+ T cells are infected cells. In comparison to CD4 T cells from the blood, the levels of viral DNA in the liver are similar.

Altogether, our results indicated that CD4+ T cells from the liver of SIV-infected RMs could be a possible viral reservoir. Further analyses are in progress to assess the extent of viral infection of CD4 T cells under ART.

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236 HIV Integrase Inhibitor Bictegravir Inhibits Proliferation, Increases Apoptosis and Mitochondrial Damage in Peripheral Blood Mononucleated Cells (PBMCs) Ex Vivo

Renying (Loulou) Cai[1,2], Anthony Y. Y. Hsieh[1,2], Aya Zakaria[1,2], Abhinav Ajaykumar[1,2], Marie-Soleil Smith[1,2], Hélène C.F. Côté[1,2]
[1]University of British Colombia, Vancouver, Canada, [2]Centre for Blood Research, Vancouver, Canada

Background: HIV antiretrovirals (ARVs) can damage mitochondria and affect their function. The relatively new drug class of HIV integrase strand transfer inhibitors (InSTI) are popular among people living with HIV for its high tolerability, few side-effects, and low pill burden. However, less is known about their mitochondrial toxicities compared to older ARVs. The InSTI dolutegravir has been associated with weight gain in adults, which may reflect changes in cellular metabolism governed by mitochondria. Mitochondrial toxicity of recently approved InSTIs bictegravir, elvitegravir+cobicistat, and cabotegravir remain unclear.

Our aim was to characterize the effects of InSTI exposure in cultured immune cells on mitochondrial health, cellular activation, and proliferation.

Methods: PBMCs from healthy volunteers were activated with anti-CD3/CD28 for 6 days while exposed to 1xCmax InSTIs in 0.1% DMSO. Mitochondrial intermembrane potential (MMP), reactive oxygen species (mtROS), and mass (mtmass), along with cellular proliferation, apoptosis, differentiation, and activation were determined by flow cytometry. Significance was determined using paired t-tests.

Results: Compared to DMSO (n=9 biological replicates), bictegravir exposure had the most pronounced effect, with greatly decreased mtmass ($p<0.001$), mtROS ($p<0.001$), MMP ($p<0.001$) and arrested proliferation ($p<0.001$). Elvitegravir+cobicistat also decreased MMP ($p<0.001$) and proliferation ($p<0.001$). In contrast, dolutegravir and cabotegravir both increased MMP ($p<0.045$), while raltegravir had no effect on any parameters. In a pilot experiment, bictegravir exposure appeared to elevate early and middle but decrease late cellular activation markers compared to controls and other InSTI treatments.

Discussion: These data clearly show that InSTIs can affect mitochondria in PBMCs. Furthermore, the effects of bictegravir ex vivo suggest a potential underlying metabolic mechanism which could hinder immune responses. It is imperative to investigate the effect of InSTIs as certain toxicities may not be apparent nor revealed by clinical trials but may exert long-term immunological and health consequences.

238 Computational advances in molecular dating of within-host HIV systems

Bradley R. Jones[1,2], Kelsie Brooks[3], Eric Hunter[3,4], Zabrina L. Brumme[1,5], Jeffrey B. Joy[1,2,6]
[1]BC Centre For Excellence In HIV/AIDS, Vancouver, Canada, [2]Bioinformatics Program, University of British Columbia, Vancouver, Canada, [3]Emory Vaccine Center, Emory University, Atlanta, United States of America, [4]Department of Pathology & Laboratory Medicine, Emory University School of Medicine, Atlanta, United States of America, [5]Faculty of Health Sciences, Simon Fraser University, Burnaby, Canada, [6]Department of Medicine, University of British Columbia, Vancouver, Canada

Molecular dating can provide insights into the timing and within-host dynamics of viral infection. Leading methods for molecular dating involve Bayesian analysis, where prior knowledge informs estimates of unknown dates. Estimating the time of the most recent common ancestor (tMRCA) of HIV sequences isolated from a person living with HIV (PLHIV) can help us estimate the timing of infection.

Furthermore, estimating the integration dates of proviral sequences sampled during long-term suppressive antiretroviral therapy (ART) can help reveal the dynamics of the persistent reservoir, thereby assisting HIV cure investigations.

We present a Java package, BBD that extends BEAST2's functionality to perform date estimation with Bayesian methods. We use our package to estimate infection and proviral integration dates in simulated and empirical data sets of longitudinally sampled HIV sequences to determine which priors on the dates produce the most accurate results.

We compared four different priors on the tMRCA, as well as no prior, to estimate infection dates using published longitudinal HIV sequence data sets; these were collected prior to ART initiation from twelve PLHIVs who recorded a negative HIV test within 29-116 days of their first positive HIV test.

We compared nine different priors to estimate proviral integration dates of HIV sequences from the persistent reservoir using simulated and published empirical data sets of longitudinal HIV sequences collected prior to, and following initiation of suppressive ART.

We found marked differences in the estimated infection and proviral integration dates using the different priors, and without using a prior. In particular, when no prior was specified, the tMRCA of an individual tended to precede their last negative HIV test.

Specifying appropriate priors provides more accurate and robust results in the date estimation of HIV. Precise understanding of HIV dynamics will aid in our efforts for HIV control and cure.

240 Development of HIV-1 Vaccines Containing Env-K425 for CD4-bound Open Conformation

Lei Qi[1], Eric Arts[1]
[1]*Western University, London, Canada*

Closed Env is resistant to most binding antibodies because immune cells have limited access to CD4-induced conserved epitopes buried inside the closed Env.

We previously reported that HIV-1 containing N425K mutation had a higher binding affinity for CD4 than its wildtype due to the generation of a new hydrogen bond and a pi-pi stacking, both of which lock Env with CD4. K425, located at the β20 bridging sheet, forms the gp120 Phe43 pocket, which is a key regulator to initiate CD4-induced conformational changes on both gp120 and gp41 subunits.

Despite the increased infectivity and binding affinity of HIV-1 containing K425, K425 is rarely seen in naturally infected individuals. We hypothesized HIV-K425 may stabilize CD4-bound structures and expose inner conserved epitopes upon CD4 contact, thus this mutant can be rapidly eliminated.

Therefore, Env-K425 could be a great candidate as an immunogen for vaccine development. We also compared the efficacy of multiple vaccine vectors, including virus-like particle (VLP), proviral DNA and vesicular stomatitis virus (VSV)-vectored HIV-1 vaccines, carrying the same immunogens, HIV-1A74_gp120 containing K425 or N425, using mouse and macaque models.

In BALB-c mice, VLPs, compared with the DNA vaccines, significantly increased the number of HIV-1-specific central memory T cells, gp120 binding antibodies and neutralizing antibodies. Interestingly, mouse splenocytes after being treated with recall antigen generated a novel CD4/CD8 double-positive (DP) T cell population that was rare in media negative or PMA positive controls.

Moreover, the percentage of central memory subset in DP T cells was higher than that of CD4/CD8 single-positive T cells. Based on the FDA-approved VSV-vectored EBOV vaccine, we engineered replicating a VSV-vectored HIV vaccine co-expressing HIV-1_gp120-K425 and Ebola-GP, and it showed 67% protection against SHIV in macaques. In summary, HIV vaccines presenting CD4-bound Env may be a solution to elicit potent immune responses targeting inner conserved epitopes.

247 Selection of High-Efficacy and Low-Toxicity Anti-HIV shRNAs for Lentiviral Delivery to a Lymphocytic Cell Line

Michelle Chen[1,2], Camille Malard[1,3], Ryan Goguen[1,3], Anne Gatignol[1,2,3], Robert Scarborough[1,3]
[1]Virus-Cell Interactions Laboratory, Lady Davis Institute for Medical Research, Montreal, Canada,
[2]Department of Medicine, Division of Experimental Medicine, McGill University, Montreal, Canada,
[3]Department of Microbiology and Immunology, McGill University, Montreal , Canada

Introduction: Gene therapy using a combination of antiviral RNAs has strong potential to cure HIV infection by providing a permanent source of HIV-resistant cells in an infected individual. shRNAs are among the top candidates for anti-HIV gene therapy because of their demonstrated specificity; our lab has previously identified an shRNA candidate targeting a highly conserved sequence in the Gag coding region of HIV RNA. shRNAs are typically transcribed from three different RNA polymerase III promoters (H1, 7SK, and U6,) that have different transcriptional efficiencies. Here, we screened several top performing shRNA candidates from the literature for efficacy and safety using the three promoters.

Methods: Preliminary efficacy was determined by measuring viral production after cotransfecting shRNAs with an NL43 HIV molecular clone in HEK 293T cells. The top-performing candidates were then cloned under H1, 7SK, or U6 and expressed from lentiviral vectors in T lymphocytes. Cells were then infected with HIV NL43 to compare replication kinetics. A competitive cell-growth assay was used to investigate whether shRNAs impact cell growth.

Results: We selected 23 shRNAs from the literature using the following criteria: high reported in vitro activity, high target site sequence conservation, and inclusion in preclinical or clinical studies. They were then cloned into plasmids with an H1 promoter. Three shRNAs expressed from the H1 promoter were particularly effective at delaying HIV replication in T lymphocytes. All shRNAs expressed from 7SK and U6 were more effective, but cell growth was negatively impacted. However, growth rates varied between different shRNA-promoter combinations, suggesting that the negative effects are partly sequence-specific.

Conclusions: 7SK and U6 promoted shRNAs are most effective for reducing HIV replication but may induce cytotoxicity depending on the sequence. Optimizing promoter-shRNA constructs and generating an effective, non-toxic combination may contribute to future stem cell transplants to functionally cure HIV infection.

248 Segmented intravaginal ring co-delivering hydroxychloroquine and siRNA-encapsulated nanoparticles for preventing HIV infection

Yannick Traore[1], Emmanuel Ho[1]
[1]*University Of Waterloo, Waterloo, Canada*

Purpose: Microbicides are an excellent alternative to condoms to help reduce transmission of human immunodeficiency virus (HIV). An intravaginal ring (IVR) would be a suitable platform that can provide controlled delivery of drugs within the female genital tract with high patient acceptance. We propose to develop a segmented combination IVR whereby one-half of the IVR will be loaded with hydroxychloroquine (HCQ), an immuno-modulatory drug that can induce a quiescent state in T cells and the other half will be coated with a pH-responsive film for the rapid release of small interfering RNA (siRNA)-encapsulated nanoparticles (siRNA-NP) against CCR5 gene, triggered by an increase in vaginal pH due to the presence of seminal fluid.

Methods: Solid lipid nanoparticles will be used to encapsulate siRNA. siRNA-NP will be mixed with Eudragit L100 and used to coat a polyurethane IVR segment fabricated by hot-melt injection molding. HCQ will be loaded in a reservoir-type polyurethane IVR segment. Release studies will be performed and cytotoxicity of the IVR segments will be evaluated on vaginal cell lines and vaginal flora. The expression of immune activation markers such as CD69 and HLA-DR will be accessed, and the CCR5 gene expression level.

Results: IVR segments coated with a pH-sensitive polymer released negligible amounts of fluorescent NP at pH 4.2. Once the pH was increased to pH8.2, there was a rapid release of 12% within 4 hrs. The reservoir-type IVR segment containing HCQ continuously released drug up to 21 days with a near zero-order release profile (R2 value =0.99) with a mean daily release of 17.01 □3.6 □g/mL. Cytotoxicity evaluation of IVR segments on vaginal cells and lactobacilli demonstrated no significant changes in cell viability or growth, respectively. The relative gene expression of CCR5 in cells treated with the siRNA-NP was significantly reduced by 83 ± 5.1% compared to non-treated cells

257 The Vaginal Microbiome of Transmasculine Individuals on Testosterone Hormone Therapy

Jason Hallarn[1], Bern Monari[2], Hannah Wilcox[1], David Guan[1], David Zuanazzi[1], Greta Bauer[1], Jacques Ravel[2], Jessica Prodger[1]
[1]Western University, London, Canada, [2]University of Maryland Baltimore, Baltimore, United States

Background: The vaginal microbiota is a key determinant of HIV susceptibility in cisgender females (cF). In cF, an optimal vaginal microbiota is dominated by Lactobacillus spp., while microbiota dominated by diverse anaerobic bacteria is associated with inflammation and increased risk of acquiring HIV. Estrogen helps support lactobacilli colonization and maintenance, and increased anaerobic diversity is observed post-menopause. Transmasculine individuals (tM) may take testosterone as a component of gender-affirming care. Testosterone therapy reduces serum estrogen levels, but little is known of its effects on the vaginal microenvironment.

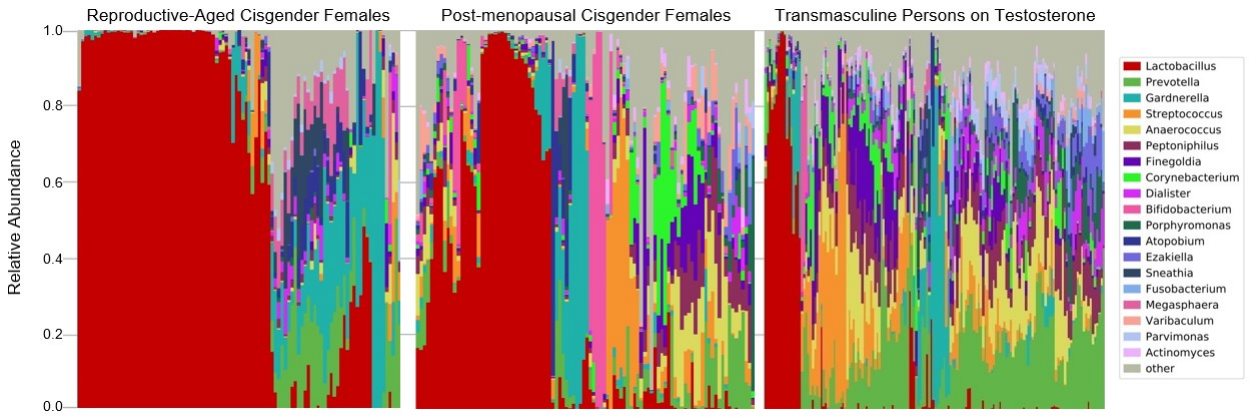
Methods: Transmasculine individuals who had been on testosterone for >1 year (n=90) completed online questionnaires and mailed in self-collected vaginal swab samples at 3 time points. Microbiota were characterized through amplification, sequencing, and bioinformatic analyses of the V3-V4 region of the 16S rRNA gene. Microbiota profiles from tM were compared to those from pre- (n=100) and post- (n=100) menopausal cF, previously published by our group.

Results: Lactobacillus spp. were detectable in 73% of tM vaginal samples but were predominant in <10%. Instead, the vaginal microbiota of tM were characterized by diverse communities of anaerobes, including species of Prevotella, Streptococcus, Anaerococcus, Finegoldia, and Peptinophilus, that were distinct from those observed in pre- and post-menopausal cF.

Conclusions: Our findings suggest that the vaginal microbiome of tM has a unique composition and structure, characterized by low abundance of lactobacilli and increased anaerobic diversity. Given the importance of the vaginal microbiota in HIV susceptibility of cF, future work will investigate relationships between microbiota, inflammation, and behavioural practices.

Supporting Document

Table 1. Relative abundance of the top 20 most abundant vaginal genera in reproductive aged cF, post-menopausal cF, and transmasculine individuals on testosterone.



261 Capturing within-host HIV-1 evolution dynamics using simulation methods

Emmanuel Wong[1], Roux-Cil Ferreira, Art F.Y. Poon
[1]*Western University, London, Canada*

The persistent latent reservoir of long-lived cells carrying integrated HIV DNA is the source of reinfection upon treatment interruption, and a primary focus for cure research. The reservoir is difficult to study because these cells are relatively rare or located in tissues that are difficult to sample. Sequencing proviral DNA in the latent reservoir is an important source of information about reservoir establishment and persistence, especially from the presence of identical (clonal) sequences.

We evaluated the relationship between clonality measures and drivers of reservoir persistence, e.g., clonal expansion, by implementing a simulation model of within-host HIV dynamics in actively and latently infected cells. We implemented a discrete event simulation in the R package treeswithintrees, with four populations of cells corresponding to active, latent, replenishment and death compartments. We used Latin Cube Hypersampling to generate parameter setting combinations to ensure sufficient coverage across all realistic parameter values.

To simulate molecular evolution on the resulting trees, we collapsed branches representing infected cells in a latent state and ran the program INDELible with parameters calibrated to HIV-1 on a representative env sequence.

We evaluated three clonality measures: the proportion of identical sequences, Gini coefficient, and number of identical pairwise comparisons. We determined that the Gini coefficient was the least responsive to variation in rates of clonal expansion. In addition, we found that the interpretation of clonality measures is contingent on other model parameters that influence the baseline probability of sampling identical sequences.

Our results caution against relying on the Gini coefficient and proportional of identical sequences when characterizing the latent reservoir. Future work includes testing this approach using real world HIV data.

275 Role of RIPK1 in SMAC mimetics induced apoptosis in primary human HIV infected macrophages

Ramon Edwin Caballero[7], Simon Xin Min Dong[1], Niranjala Gajanayaka[2], Hamza Ali[1,2], Edana Cassol[3], William D. Cameron[1,4], Robert Korneluk[1,2], Michel J. Tremblay[5], Jonathan B. Angel[1,4], Ashok Kumar[1,2,6]

[1]Department of Biochemistry, Microbiology, and Immunology, Faculty of Medicine, University of Ottawa, Ottawa, Canada, [2]Division of Virology, Apoptosis Research Centre, Children's Hospital of Eastern Ontario Research Institute, Ottawa, Canada, [3]Department of Health Sciences, Carleton University, Ottawa, Canada, [4]Division of Infectious Diseases, The Ottawa Hospital Research Institute, Ottawa, Canada, [5]Centre de recherche du CHU de Québec Université Laval, Université Laval, Québec, Canada, [6]Department of Pathology and Laboratory Medicine, Faculty of Medicine, Ottawa, Canada, [7]Department of Microbiology and Immunology, Faculty of Medicine, McGill University, Montreal, Canada

Introduction: Macrophages serve as viral reservoirs due to their resistance to apoptosis and HIV-cytopathic effects. We have previously shown that inhibitor of apoptosis proteins (IAPs) confer resistance to HIV-Vpr-induced apoptosis in normal monocyte-derived macrophages (MDMs). Degradation of IAPs by synthetic second mitochondrial activator of caspases (SMAC) mimetics (SMs) induce cell death of HIV-Vpr-treated MDMs. Herein, we hypothesized that SMs selectively induce programmed cell death of HIV-infected MDMs.

Methods: U937 and U1 cell lines, in vitro mock and HIV-1 (clinical isolate CS204) or HIV-1 NL4.3-Bal-HSA (heat stable antigen reporter) infected MDMs from healthy donors, and MDMs derived from HIV-infected patients were treated with SMs or IAP silencing RNA. Cell death was assessed by intracellular PI staining or Annexin V staining and flow cytometry. Degradation of IAPs and proteins involved in apoptosis such as RIPK1, caspase-3, -8-, and -9 were assessed by western immunoblotting. HIV-1 DNA were quantified through nested qPCR.

Results: SMs induced apoptosis in U1, in vitro HIV-infected MDMs, and MDMs derived from HIV-infected patients, but not in uninfected U937 and mock-infected MDMs. Moreover, apoptosis specifically occurred in HIV-infected MDMs expressing HSA reporter protein, as shown by the activation of caspase-3, -8, and -9. In healthy MDMs, SM-induced IAP degradation failed to induce apoptosis but with concomitant inactivation of RIPK1 by necrostatin-1 resulted in high degree of cell death. Interestingly, in vitro HIV infection caused receptor interacting protein kinase-1 (RIPK1) degradation over time, and HSA-expressing HIV-infected MDMs showed decreased levels of RIPK1 compared to mock or uninfected MDMs.

Conclusion: Altogether, our results show that SM selectively induce apoptosis in primary human macrophages infected in vitro with HIV-1 possibly through the concomitant downregulation or inactivation of RIPK1. Thus, modulation of the IAP and apoptosis pathways may be a potential strategy for selective killing of HIV-infected macrophages in vivo.

290 Impact of Older Age on Immune Durability After Two-dose COVID-19 mRNA Vaccines and Immune Reactivity After a Third Dose

Francis Mwimanzi[1], Hope Lapointe[2], Peter K Cheung[1,2], Yurou Sang[1], Fatima Yaseen[1], Gisele Umviligihozo[1], Olga Agafitei[1], COVID-19 Vaccine Study Group[1,2,3,4], Masahiro Niikura[1], Marc G. Romney[3,4], Zabrina L Brumme[1,2], Mark A Brockman[1,2]
[1]Faculty of Health Sciences, Simon Fraser University, Burnaby, Canada, [2]British Columbia Centre for Excellence in HIV/AIDS, Vancouver, Canada, [3]Department of Pathology and Laboratory Medicine, University of British Columbia, Vancouver, Canada, [4]Division of Medical Microbiology and Virology, St. Paul's Hospital, Vancouver, Canada

Older adults remain at higher risk of severe COVID-19. Two-dose mRNA vaccines reduce hospitalization and mortality, but immune protection declines, and third doses are now recommended. We examined immune durability up to 6 months after two vaccine doses, and immunogenicity after a third vaccine dose in 151 adults ranging in age from 24 to 98 years.

Specimens were collected from 81 healthcare workers (median age 41 years), 56 older adults (median 78 years) and 14 COVID-19 convalescent individuals (median 48 years), at one, three and six months following the second dose and from 15 HCW, 28 older adults and 3 convalescent individuals at one month following a third dose. Binding antibodies to the SARS-CoV-2 spike receptor binding domain were quantified using an immunoassay (Roche Elecsys). Virus neutralizing activity was assessed using a live SARS-CoV-2 infection assay.

Compared to healthcare workers, older adults displayed ~1.9-fold lower peak binding antibodies one month after the second dose ($p<0.001$) and modestly faster rates of antibody decline thereafter ($p=0.005$). Peak neutralizing activity was 4-fold lower in older adults one month after the second dose ($p<0.001$) and became undetectable in most individuals by six months. One month after a third dose, binding antibodies and neutralizing activities surpassed peak values after two doses in both groups, and differences were no longer statistically significant. Compared to both naïve groups, convalescents displayed slower rates of binding antibody decline ($p<0.006$) and maintained higher neutralizing activity six months after the second dose.

Immune responses to two-dose COVID-19 mRNA vaccines are attenuated in older adults, but binding antibodies and neutralizing activity are enhanced significantly by a third dose. Potentially faster rates of antibody decline in older adults suggest that waning of responses should be monitored for this group.

304 Linkage of HIV Escape Mutations to a Novel Host Genomic Locus Associated With Control of HIV Replication

Vanessa Schulz[1,2], Rupert Capina[2], Jeff Tuff[2], Lara Lewis[3], Joshua Kimani[4], Lyle R. McKinnon[1,3,4], Ayesha Kharsany[3], Paul McLaren[1,2]
[1]Department of Medical Microbiology and Infectious Diseases, University Of Manitoba, Winnipeg, Canada, [2]National HIV and Retrovirology Lab at the JC Wilt Infectious Diseases Research Centre, National Microbiology Laboratories, Public Health Agency of Canada, Winnipeg, Canada, [3]Centre for the AIDS Programme of Research in South Africa , Durban , South Africa , [4]Department of Medical Microbiology, University of Nairobi, , Kenya

HIV set point viral load (spVL) is a predictor of HIV disease progression and transmission, thus restriction of spVL is key to ending the AIDS pandemic. There is variability in HIV spVL among individuals, with host genetics, particularly in the HLA region, contributing to this variability.

However, HIV can develop escape mutations to evade host pressure, counteracting their effect. A recent GWAS of >3,800 HIV+ individuals of African ancestry, performed by our group, identified a novel locus on chromosome 1 that associates with control of HIV replication. A variant within this region, rs59784663(G), is associated with an average ~0.3 log10 reduction in HIV spVL (p=2.0x10-9) and is downstream from the protein coding gene chromodomain helicase DNA binding protein 1 like (CHD1L). Despite the spVL decreasing effect of rs59784663, some individuals with the protective allele still have high spVLs.

Given the high mutation rate and short generation time of HIV, we hypothesized that selective mutation of the viral genome would allow HIV to escape restriction by CHD1L. We test this hypothesis by conducting a viral genome-to-host genome analysis in 97 individuals from South Africa with both human and viral genomic data available. Human genetic variants in the CHD1L region and HLA are tested for association with amino acid (AA) variants in the HIV proteome.

Analyses found a significant association between the CHD1L variant rs59784663 and AA codon 248 of HIV reverse transcriptase (p=9.9x10-3). In addition, there were significant associations between HLA B*81 (p=1.5x10-5) and HLA C*18 (p=1.4x10-3) with AA codon 4 and HLAB*58 with AA codon 196 (p=1.0x10-3) in HIV reverse transcriptase.

Ongoing work will seek to replicate these associations in other African populations. This study has the potential to reveal regions of conflict between the host and viral genomes, increasing our understanding of viral evolution and host control of HIV.

305 Comparison of Epithelium Permeability between in vitro Organotypic, Ex-vivo and Explant Foreskin Models and Feasibility for Co-culture with Bacteria

Shirley Constable[1], Geoffrey Rempel[1], David Zuanazzi[1], Dr. Jessica Prodger[1]
[1]*Univeristy of Western Ontario, London, Canada*

Susceptibility to HIV infection following sexual exposure varies greatly, suggesting underlying risk factors- such as the genital microbiome- are critical for transmission. Circumcision reduces HIV risk by 60%, however a biological explanation for this relationship remains elusive.

We recently identified 6 strict anaerobic bacterial species whose abundance under the foreskin was associated with risk of HIV seroconversion, increased local levels of pro-inflammatory cytokines and tissue density of HIV target cells. These findings suggest specific anaerobes drive local inflammation thereby increasing HIV susceptibility, however our observational studies cannot elucidate causal relationships.

To solve this problem, an in vitro approach is required for empirical study of foreskin-microbiome dynamics. Here we show that our newly developed 3D organotypic foreskin model recapitulates physiological properties of skin and is suitable for co-culture with relevant bacteria.

Primary foreskin fibroblasts and keratinocytes are used to generate tissues with dermal and fully stratified epidermal layers that mimic fundamental skin properties such as epithelial barrier function. Dextran tracer assays show lower permeability in organotypic tissue relative fresh (ex-vivo) and cultured (7-day) foreskin explant tissues (widely used for in vitro studies but highly limited by their rapid degradation in viability and structure).

When organotypic tissue was inoculated with Staphylococcus epidermidis, bacterial growth was observed by qPCR after 72 hours and tissue remained intact, suggesting that our model can support bacterial colonization. These results indicate that our model provides a stable, physiologically relevant environment for bacterial co-culture, previously absent in the literature.

Our in vitro approach forms the basis for future studies to ascertain which bacterial species drive local inflammation and identify the inflammatory pathways involved, filling a current gap that has prevented the formation of causal and mechanistic conclusions.

This model will deepen our understanding of foreskin-microbial interactions- a critical step toward developing novel preventative measures for HIV.

321 Screening viral host dependency factors via functional genomics in silico and in vitro for drug targeting

Rubendren Jamilchelvan[1,2], Riley Tough[1,2], Michelle Perner[2], Xia Liu[3], Eric Enns[3], Gary Van Domselaar[1,3], Paul McLaren[1,2]
[1]Department of Medical Microbiology and Infectious Diseases, University of Manitoba, Winnipeg, Canada, [2]National HIV and Retrovirology Laboratory at the JC Wilt Infectious Diseases Research Centre, National Microbiology Labs, Public Health Agency of Canada, Winnpeg, Canada, [3]Bioinformatics Group, National Microbiology Labs, Public Health Agency of Canada, Winnipeg, Canada

Viruses are obligate intracellular pathogens that require many host cell components to complete their life cycles. Several genome-wide screens have been performed across multiple viral models that have identified hundreds of these viral host dependency factors (HDFs). These HDFs may be good candidates to develop novel host-directed antivirals.

However, defining which HDF may make good targets and which HDF may lead to drug toxicity is challenging. Intersecting genes found to be viral HDFs and also not essential for host function, may open new avenues for the development of therapies.

We performed a comprehensive literature review and identified 27 studies covering HIV, Hepatitis C, Hepatitis D, SARS-CoV-2, SARS-CoV, Ebola, Influenza A, Zika, Dengue and West Nile viral models. A cumulative total of 3248 HDFs were collected and 320 genes were implicated in more than 1 virus.

With software like DAVIDv6.8 and REACTOME, we determined that the most hijacked biological pathway by all these viruses is phagosome acidification (mostly used for cell entry). These HDFs were then intersected with the genome aggregation database (gnomAD) using an in-house bioinformatic pipeline, the genome non-essentiality and loss-of-function identifier (gNALI). The gnomAD resource contains >125,000 human exome and >15,000 whole-genome sequences from healthy individuals with specific information on genes harbouring loss-of-function polymorphisms.

The output of gNALI is a list of genes that are HDFs with observed loss-of-function polymorphisms from gnomAD. Finally, we narrowed down six genes that can be potentially targeted as host-directed antiviral targets for HIV and one other virus for our future wet-lab study.

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18 Assessing the Sensibility, Utility and Implementation of a Short-Form Version of the HIV Disability Questionnaire in Clinical Practice Settings in Canada, Ireland and the United States: A Mixed Methods Study

Kelly O'Brien[1], Patricia Solomon[2], Aileen Davis[1], Soo Chan Carusone[3], Kristine Erlandson[4], Colm Bergin[5,6], Ahmed Bayoumi[1,7], Steven Hanna[2], Richard Harding[8], Darren Brown[9], Jaime Vera[10,11], Marta Boffito[9], Rachel Aubry[1], Carolann Murray[3], Noreen O'Shea[5], Natalie St. Clair-Sullivan[10,11], Mallory Boyd[4], Marilyn Swinton[1], Brittany Torres[1]
[1]University of Toronto, Toronto, Canada, [2]McMaster University, Hamilton, Canada, [3]Casey House, Toronto, Canada, [4]University Colorado Denver, Denver, United States, [5]St. James's Hospital, Dublin, Ireland, [6]Trinity College Dublin, Dublin, Ireland, [7]St. Michael's Hospital, Toronto, Canada, [8]King's College London, London, United Kingdom, [9]Chelsea and Westminster Hospital NHS Foundation Trust, London, United Kingdom, [10]Brighton and Sussex Medical School, Brighton, United Kingdom, [11]Brighton and Sussex University Hospitals NHS Trust, Brighton, United Kingdom

PURPOSE: The Short-Form HIV Disability Questionnaire (SF-HDQ) was developed to measure the presence, severity and episodic nature of health challenges across six domains. Our aim was to assess the sensibility, utility and implementation of the SF-HDQ in clinical practice.

METHODS: We conducted a mixed methods study with adults living with HIV and HIV health care providers in Canada, Ireland, and United States. We electronically administered the SF-HDQ followed by a sensibility questionnaire (face and content validity, ease of usage, format) and conducted semi-structured interviews (exploring potential utility and implementation of the SF-HDQ in clinical practice). We considered the SF-HDQ sensible if median scores on the sensibility questionnaire were ≥5 out of 7 for adults living with HIV and ≥4 out of 7 for HIV health providers for ≥80% of the items. Qualitative interview data were analyzed using directed content analysis.

RESULTS: Median sensibility scores were ≥5 for adults living with HIV (n=29) and ≥4 for HIV health providers (n=16) for 95% of items (18/19 items). Qualitative data indicated that the SF-HDQ represented the health-related challenges (disability) of living with HIV and other health conditions (where HIV was not the source of disability), captured the daily episodic nature, and was easy to use or complete. Potential utility of the SF-HDQ included measurement of health challenges and change over time, guiding referrals to services, informing goal setting, facilitating communication, and fostering self-reflection of health domains living with HIV. Considerations for implementation included flexible, person-centred approaches to mode and processes of administration, and communicating scores based on personal preferences among persons living with HIV and HIV health providers.

DISCUSSION: The SF-HDQ appears to possess sensibility and utility for use in clinical settings with adults living with HIV and HIV health providers in three countries. Next steps include developing a guidance document for implementation.

19 Body Composition Changes Across a Three-Phased Community-Based Exercise Intervention Study Among Adults Living with HIV

Kelly O'Brien[1], Ahmed M. Bayoumi[1,2], Lisa Avery[3], Soo Chan Carusone[4], Ada Tang[5], Patricia Solomon[5], Rachel Aubry[1], Brittany Torres[1], Mehdi Zobeiry[6], Ivan Ilic[6], Zoran Pandovski[6], Aileen Davis[1,3]

[1]University of Toronto, Toronto, Canada, [2]St. Michael's Hospital, Toronto, Canada, [3]University Health Network, Toronto, Canada, [4]Casey House, Toronto, Canada, [5]McMaster University, Hamilton, Canada, [6]YMCA of Greater Toronto, Toronto, Canada

OBJECTIVE: Our aim was to examine changes in body composition among people living with HIV (PLWH) engaged in a community-based exercise (CBE) intervention.

METHODS: We conducted a 22-month interrupted time series study with PLWH recruited from community. We measured body mass index (BMI)(primary outcome), weight, fat weight, fat free mass, body fat percentage bimonthly across three phases: 1)Baseline Monitoring (8 months), 2)CBE Intervention: participants were asked to exercise 3 times/week, with weekly coaching (6 months), and 3)Follow-Up: participants were asked to continue with thrice weekly exercise independently (8 months). We used segmented regression to assess the change in trend (slope) between phases.

RESULTS: Of the 108 participants who initiated the study, 80(74%) started and 67/80(84%) completed the intervention; and 52/67(77%) completed the study. Of 102 participants with body composition data, the median age was 51 years (25th,75th percentiles:44,59), with a median of 4(2,7) concurrent health conditions. Baseline BMI(sd) was 25.6(5.2)kg/m² for males (n=91) and 31.3(7.7)kg/m² for females (n=11). Median number of coaching sessions attended was 18/25(72%). Decrease in BMI attributed to the six-month Phase 2 intervention after taking the baseline into account was 0.38kg/m² (95%Confidence Interval(CI):-0.76,-0.01). Trends attributed to the intervention were observed for reductions in weight (-0.86kg; 95%CI:-1.76,0.03), fat weight (-0.45kg; 95%CI:-1.12,0.21), fat free mass (-0.50kg; 95%CI:-1.29,0.28), and body fat percentage (-0.28%; 95%CI:-0.98, 0.42). For the monthly rate of change (slope), there was a significant decrease in fat weight (-0.10kg/month; 95%CI:-0.12,-0.03) and body fat percentage (-0.1%/month; 95%CI:-0.18,-0.03) in Phase 2. During Phase 3 follow-up, there was a significant reduction in trend of benefits observed during the intervention phase for fat weight.

CONCLUSION: Little to no variation in body composition occurred across the phases. This may be because the intervention was not tailored towards changes in body composition, or because the intervention dose was not high enough to affect change.

25 Characterizing uptake of opioid agonist therapy among people living with HIV in British Columbia

Kiana Yazdani[1], Kate Salters[1,3], Katerina Dolguikh[1], Monica Ye[1], Jason Trigg[1], Ronald Joe[2], Julio Montaner[1], Rolando Barrios[1,2]
[1]BC Center for Excellence In HIV/AIDS Research, Vancouver, Canada, [2]Vancouver Coastal Health, Vancouver, Canada, [3]Simon Fraser University, Burnaby, Canada

Background: Among people living with HIV (PLWH) who use opiates, there is an elevated risk of death and adverse outcomes. Opioid agonist therapy (OAT) can play a crucial role in reducing those health disparities. We aim to characterize OAT uptake among PLWH in British Columbia (BC) in a population-based cohort.

Methods: Data were derived from the Seek and Treat for Optimal Prevention of HIV/AIDS (STOP HIV/AIDS) study, which includes PLWH ≥19 years old in BC, between April 1996 and March 2017. Participants with known gender ≥12 months of follow-up were included. Receipt of OAT was identified through PharmaNet, which includes all medications dispensed by BC pharmacies, using Drug/Product Identification Numbers.

Results: We identified 2,148 (15.9%) PLWH who were ever prescribed with OAT among a sample of 13,433 PLWH, of which 67.6% (n=1,453) had their first prescription after their HIV diagnosis (i.e. after cohort entry). Characteristics of this population are presented in table 1.About 40% were women and about 80% were ≤ 44 years. At first uptake, 95.8% of OAT prescriptions were Methadone, and were mainly prescribed by general practitioners (93.3%). This cohort is characterized by high prevalence of complex conditions such substance use (69.3%), mood disorders (63.3%), depression (55%), hepatitis C (39.7%), and chronic pain (22.4%).

Conclusion: In BC, from 1996-2017, nearly 1 in 6 PLWH is prescribed OAT at least once. The syndemic of complex comorbidities among PLWH receiving OAT highlight the necessity of integrated care models that increase likelihood of long-term retention for PLWH in OAT treatment.

Supporting Document

Gender	
Men (inclusive of trans- and cisgender)	1,292 (60.1)
Women (inclusive of trans- and cisgender)	856 (39.8)
Age (years)	
19-34	849 (39.5)
35-44	841 (39.1)
45-54	375 (17.4)
55+	83 (3.8)
OAT type	
Methadone	2,058 (95.8)
Buprenorphine	73 (3.4)
Injectable OAT	17 (0.7)
Prescriber type	
General Practitioner	2,006 (93.3)
Community Medicine	16 (0.7)
Psychiatrists	61 (2.8)
Infectious Disease Specialist	10 (0.4)
Internal Medicine	26 (1.21)
Others	29 (1.35)
Year of first OAT dispensation **	
1996-2007	1,445 (67.2)
2008-2013	476 (22.1)
2014-2017	227 (10.5)
Suppressed HIV viral load (<200 ml/copies)	333 (15.5)
Injection drug use history	1,642 (76.4)
Comorbidities	
Substance Use Disorder	1,488 (69.3)
Mood and Anxiety Disorder	1360 (63.3)
Depression	1,181 (55)
Chronic Pain	482 (22.4)
Psychosis	227 (10.6)
Hepatitis C Virus	853 (39.7)
Opioid Prescriptions (excluding OATs)	978 (45.5)

Note: All variables are described at the time of first OAT dispensation, and are described in proportions, n (%).
** The year categories reflect BC guidelines in availability of different OAT types in the province; Percent of PLWH who received any OAT prescriptions in each year category (not mutually exclusive): 1996-2007: 100% methadone; 2008-2013: 99.3% methadone, 4.5% buprenorphine; 2014-2017: 93.4% methadone, 23.8% buprenorphine, 3.6% injectable OAT.
Abbreviations: OAT: opioid agonist therapy;

27 Changing Landscape of Liver Transplantation in Post-DAA and contemporary ART Era

Huma Saeed[1,2], Edison Cano[1], Nathan Cummins[1], Michael Leise[1], Zachary Yetmar[1], Mohammad Qasim Khan[1,2], Andrew Badley[1], Stacey Rizza[1], Maryam Mahmood[1]
[1]Mayo Clinic, Rochester, United States , [2]London Health Sciences Center, London, Canada

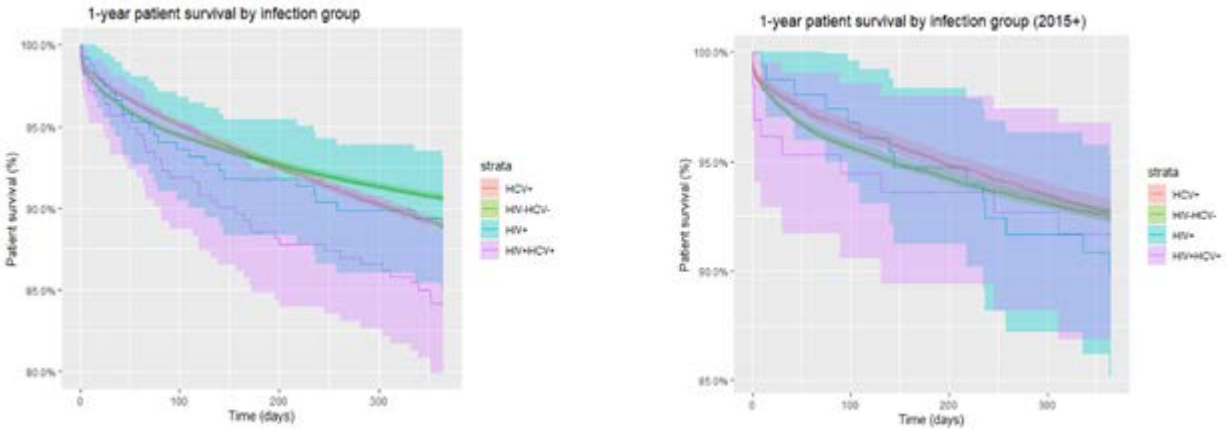
Background: Highly effective combination anti-retroviral therapy has drastically improved solid organ transplantation outcomes in persons living with HIV. Outcomes in HIV/HCV co-infected liver transplant recipients have been historically reported to be worse than HCV mono-infected individuals. Introduction of DAA therapy has led to successful eradication of HCV. However, it remains unclear whether this can be translated to improved outcomes in HIV/HCV co-infected liver transplant recipients in the post-DAA era.

Materials and Methods: Data was collected from UNOS database of all first-time deceased donor liver transplant recipients between January 1, 2000 until September 30, 2020. Kaplan-Meier survival curves and logistic regression were used for outcomes analysis.

Results: A total of 85,730 patients met inclusion criteria. One-year and five-year patient survival outcomes improved (93% and 80% respectively) for all liver transplants performed after 2015. This finding translated over to HIV/HCV co-infected patients, in whom transplant outcomes improved significantly from 78% (before 2015) to 92% (2015 onwards). In the multivariate analyses, advanced recipient age (OR 1.02, CI 1.01 – 1.02, p<0.001), black race (OR 1.34, CI 1.17 – 1.54, p<0.001), recipient diabetes mellitus (OR 1.18, CI 1.08 – 1.28, p<0.001) and decompensated cirrhosis were found to be risk factors associated with higher one-year mortality. Reassuringly, detectable HCV viral load at the time of transplant was not associated with poorer outcomes (OR 1.03, CI 0.77 – 1.35, p=0.9), and neither was presence of HIV/HCV co-infection at the time of transplant (OR 1.1, CI 0.56 – 2.08, p=0.7).

Conclusion: Liver transplant outcomes in HIV/HCV co-infected liver transplant recipients have significantly improved in the era of highly effective ART and DAA therapy as well as rigorous immunosuppression monitoring. Presence of HIV, HCV and HIV/HCV co-infection did not render higher mortality risk in liver transplants performed after 2015.

Supporting Document



28 Evaluating Healthy Aging Among Canadian HIV-positive Older Adults in the CHANGE-HIV Cohort

Alice Zhabokritsky[1,2], Rosemarie Clarke[2,3], Ron Rosenes[2], Sharon Walmsley[1,2,3]
[1]University Of Toronto, Toronto, Canada, [2]University Health Network, Toronto, Canada, [3]Toronto General Hospital Research Institute, Toronto, Canada

The gap in life expectancy between people living with HIV (PLWH) and the general population continues to narrow, however, important differences in age-related comorbidities and quality of life persist. To support healthy aging in this population, goals of treatment need to expand beyond virologic control and immunologic recovery. Examining health as a multidimensional state can guide development of preventative and management strategies to address the complex social and healthcare needs of aging PLWH.

The CHANGE-HIV (Correlates of Healthy Aging iN GEriatric HIV) study, is a Canadian cohort of PLWH age >65. In this cohort, healthy aging is assessed using the Rotterdam Healthy Aging Score (HAS). Scores are calculated across 7 domains of health (chronic disease, mental health, pain, social support, quality of life, cognitive and physical function). We report on the HAS for the first 216 participants in the cohort and determine the proportion of those with healthy (13-14), intermediate (11-12), and poor aging scores (0-10). Scores were compared by sociodemographic and HIV-related factors. Kruskal-Wallis and Fisher's exact tests were used for comparisons.

Median (IQR) age was 71 (68-74), 192 (90%) were men, 19 (9%) women and 3 (1%) transgender. Majority of participants were white (78%), born in Canada (65%) and retired (77%). Median (IQR) HAS was 12 (10-13) with 34% achieving healthy, 39% intermediate and 27% poor aging scores. Women and transgender participants were more likely to have poor aging scores, compared to men (p=0.002). HAS scores did not differ by age (p=0.691), race (p=0.510) or CD4 nadir (p=0.535), but those with longer duration of HIV infection had lower HAS scores (p=0.043).

Gender and duration of HIV infection seem to impact the aging experience of PLWH. Using a multidimensional score like the HAS can identify individuals at risk of poor clinical outcomes and direct interventions that support healthy aging.

34 The Experience of Migrant Patients with Rapid and Free B/F/TAF Initiation in a Montreal-based Multidisciplinary HIV Care Setting

Anish Arora[1,2,3], Serge Vicente[3,4], Adriana Rodriguez-Cruz[1,2,3], David Lessard[2], Kim Engler[2,3], Nadine Kronfli[2,5], Jean-Pierre Routy[5], Marina Klein[5], Joseph Cox[5], Alexandra de Pokomandy[1,5], Giada Sebastiani[5], Benoit Lemire[5], René Wittmer[6], Bertrand Lebouché[1,2,3,5]
[1]Department of Family Medicine, Faculty of Medicine, McGill University, Montréal, Canada, [2]Centre for Outcomes Research & Evaluation, Research Institute of the McGill University Health Centre, Montréal, Canada, [3]Canadian Institutes of Health Research Strategy for Patient-Oriented Research (CIHR/SPOR) Mentorship Chair in Innovative Clinical Trials in HIV Care, Montréal, Canada, [4]Department of Mathematics and Statistics, Université de Montréal, Montréal, Canada, [5]Department of Medicine, Chronic Viral Illness Service, Division of Infectious Diseases, McGill University Health Centre, Montréal, Canada, [6]Department of Family Medicine and Emergency Medicine, Université de Montréal, Montréal, Canada

Background: Rapid antiretroviral therapy (ART) initiation for persons newly diagnosed with HIV is a key strategy to ending the HIV epidemic. However, vulnerable populations such as migrants living with HIV (MLWH) often experience delays in accessing HIV care, initiating ART, and achieving viral suppression. Initiating ART rapidly in a multidisciplinary environment may reduce barriers encountered by MLWH. This study explores MLWH experiences with rapid and free ART initiation within a multidisciplinary clinic specializing in HIV.

Methods: In January 2020, we initiated a 96-week prospective longitudinal cohort study with a convergent mixed-method design at a clinic serving the largest proportion of MLWH in Montreal, Quebec. All patients received bictegravir/emtricitabine/tenofovir alafenamide (B/F/TAF) free of charge. Only preliminary qualitative data are presented here. Interviews were conducted with 18 MLWH and analyzed via Gale et al.'s Framework Method.

Results: Qualitative analysis generated 4 sets of themes which highlighted: 1) facilitators which enabled MLWH to engage with HIV care and treatment (e.g., free ART and non-judgmental healthcare staff and clinicians), and MLWH's overall satisfaction with their current care and treatment; 2) barriers that MLWH continue to encounter (e.g., navigating different clinics to access free blood tests); 3) the need to improve multidisciplinary care teams to further address challenges encountered by MLWH (e.g., through empowering patients, while also refining communication and coordination between all stakeholders); and (4) the intersectional burden experienced by MLWH due to HIV, migration, and COVID-19 (e.g., many MLWH moved to Canada just before pandemic-related lockdown measures were implemented, hindering their integration into Canada and HIV-related healthcare).

Conclusions: Results suggest that free and rapid B/F/TAF initiation can lead to satisfaction for MLWH. Despite rapid initiation and cost covered ART within a multidisciplinary model, challenges continue to impede MLWH engagement, revealing a need for targeted interventions on the issues of communication, coordination, and empowerment.

35 Kaposi sarcoma in ART-treated PLWH and HIV-uninfected people: differences in viral and immune characteristics

Léna Royston[1], Stéphane Isnard[1], Carolina Berini[1], John Lin[1], Brandon Fombuena[1], Josée Girouard[1], Jean-Pierre Routy[1]
[1]McGill University Health Centre, Montréal, Canada

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 CD4 and CD8 counts, anti-HHV-8 IgGs, gut permeability (LPS/I-FABP/Reg3) and senescence plasmatic markers (GDF15/suPAR). In PBMCs and skin biopsies, HHV-8 viral loads were quantified by digital-droplet PCR. In skin biopsies, cells were isolated and analyzed by flow cytometry.

Results: 22 patients with KS have been recruited, 11 KS ART HIV+ and 11 KS HIV-. KS ART HIV+ were younger than KS HIV- (53yo vs 77, $p<0.001$). Despite similar CD4 T-cell count ($p=0.30$), KS ART HIV+ had a higher CD8 T-cell count ($p=0.007$) and lower CD4/CD8 ratio ($p=0.03$). Gut permeability markers were similar between both groups but GDF15 and suPAR were higher in KS HIV- ($p=0.01$). In PBMCs, HHV-8 DNA was detected in 6/11 of KS ART HIV+ and 3/11 KS HIV-. Anti-HHV-8 IgG titers tended to be higher in KS ART HIV+ than KS HIV- ($p=0.07$). In skin biopsies, HHV-8 DNA was detected for all participants and isolated CD4 and CD8 T-cells highly expressed PD1 (>50%) both in KS ART HIV+ and KS HIV- ($p=0.20$).

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. HHV-8 control seems altered in KS ART HIV+, with HHV-8 DNA more frequently detected in PBMCs. Moreover, PD1 expression on tumoral lymphocytes suggests T-cell dysfunction and a potential therapeutical target. Such insights will help reducing KS-induced stigma and developing therapeutical strategies.

37 Bictegravir/emtricitabine/tenofovir alafenamide (B/F/TAF) five-year outcomes in treatment-naïve adults

David Wohl[1], Anton Pozniak[2], Kimberly Workowski[3], Debbie Hagins[4], Eric Daar[5], **Jonathan Angel[6]**, Joseph Cox[7], Ellen Koenig[8], Karam Mounzer[9], Samir Gupta[10], Hailin Huang[11], Rima Acosta[11], Jason Hindman[11], Jared Baeten[11], Hal Martin[11], Paul Sax[12]
[1]UNC School of Medicine, Chapel Hill, US, [2]Chelsea and Westminster Hospital, London, UK, [3]Emory University, Atlanta, US, [4]Chatham County Health Department, Savannah, US, [5]Lundquist Institute at Harbor-UCLA Medical Center, Torrance, US, [6]Ottawa Hospital Research Institute, Ottawa, CA, [7]McGill University Health Centre, Montreal, CA, [8]Instituto Dominicano de Estudios Virólgicos, Santo Domingo, Dominican Republic, [9]Philadelphia FIGHT/Perelman School of Medicine, Univ. of Pennsylvania, Philadelphia, US, [10]Indiana CTSI Clinical Research Center, Indianapolis, US, [11]Gilead Sciences Inc., Foster City, US, [12]Brigham and Women's Hospital, Boston, US

Bictegravir/emtricitabine/tenofovir alafenamide (B/F/TAF) is a guidelines-recommended single-tablet regimen for people with HIV-1 (PWH). We present 5-year cumulative outcomes of two phase 3 studies of B/F/TAF in treatment-naïve PWH.

Study 1489: B/F/TAF vs DTG/ABC/3TC and Study 1490: B/F/TAF vs DTG+F/TAF are randomized, double-blind, phase 3 studies in treatment-naïve adults. After completing 144W of blinded treatment, participants were offered continuation of B/F/TAF for 96W in open-label extensions (OLEs). Efficacy analysis included HIV-1 RNA <50 copies/mL at each visit after starting B/F/TAF (missing=excluded analysis); safety by adverse events (AEs) and laboratory results. Bone mineral density (BMD) was measured in those randomized to B/F/TAF in 1489.

252/314 participants in 1489 and 254/320 in 1490 randomized to B/F/TAF enrolled in OLE. 254/315 randomized to DTG/ABC/3TC in 1489 and 265/325 randomized to DTG+F/TAF in 1490 enrolled in OLE. Baseline (BL) demographics of B/F/TAF participants in 1489 and 1490 include: median age 31 and 33, 9% and 13% female, respectively. Efficacy was >98% after W48 at each study visit through W240 in both studies. No resistance to components of B/F/TAF was detected. During the OLE, 6/504 B/F/TAF participants experienced an AE that led to drug discontinuation, none were renal; ≤1.6% had a Grade 3 or 4 drug-related AE. All arms had numerically small median changes in eGFR and stable TC: HDL. Median change in weight from BL to W240 was 6.1kg in B/F/TAF participants; median weight change for comparators at W144: 3.5kg (1489) and 5.0kg (1490), with 2.4kg and 1.3kg additional gains observed between W144 to W240, respectively. Mean % changes (SD) in hip and spine BMD through W240 in B/F/TAF participants were -0.29% (5.29) and -0.23% (5.16), respectively.

Over 5 years of follow up in treatment naïve PWH, B/F/TAF was well tolerated and highly efficacious. These results confirm long term safety and efficacy of B/F/TAF.

40 Virologic Outcomes Following In-patient Initiation of Antiretroviral Therapy in a Population-Based Program in British Columbia, Canada

Wayne Leung[1], Wendy Zhang[2], Jason Trigg[2], Diana Kao[2], Junine Toy[2], Viviane D. Lima[1,2], Rolando Barrios[1], Julio Montaner[1,2], Mark Hull[1,2]

[1]Faculty of Medicine, University of British Columbia, Vancouver, Canada, [2]British Columbia Centre for Excellence in HIV/ AIDS, Vancouver, Canada

Background: Initiation of antiretroviral therapy (ART) is a critical step in the HIV continuum of care. Inpatient admission may provide an opportunity to engage vulnerable populations living with HIV (PLWH).

Methods: A retrospective study of adults (19 years or older) PLWH enrolled in the British Columbia HIV Drug Treatment Program who initiated ART January 2003 - December 2019 was conducted. A multivariable logistic model for factors associated with in-hospital vs. community ART start was performed, adjusting for age, gender, HIV transmission group and AIDS illness. Viral suppression (<50 copies/mL) at one, two and three years after treatment initiation was compared for in-hospital vs. community initiation.

Results: A total of 5434 individuals initiated ART during the study period; 5052 (93%) were initiated in the outpatient setting, and 272 (5%) in-hospital. Age per 10-year increment (adjusted Odds Ratio [aOR] 1.19, CI: 1.06-1.35), female gender (aOR 1.61, CI: 1.16 - 2.24), year of ART initiation per 1-year increment (aOR 1.19, CI: 1.15-1.23), history of AIDS defining illness prior to ART start (aOR 5.43, CI: 4.06-7.24), history of injection drug use (aOR 2.52, 1.67-3.81), and MSM with history of injection drug use (aOR 2.85, CI: 1.56-5.21) were significantly associated with ART starts in hospital. Virologic suppression at one year was lower for in-hospital vs. community (79% vs. 93%, $p < 0.001$) initiation, but was similar after two (94% vs. 94%, $p = 0.956$) and three (96% vs. 96%, $p = 0.924$) years.

Conclusion: Individuals initiating therapy in hospital were more likely to have advanced HIV or history of injection drug use. Long-term virologic suppression was similar for in-hospital and outpatient initiation. Efforts to improve healthcare provider comfort with ART initiation during hospital stays and linkage to outpatient follow-up may be warranted.

45 Subgroups efficacy analyses of long-acting subcutaneous lenacapavir in Phase 2/3 in heavily treatment-experienced people with HIV (CAPELLA study)

Hans-Jurgen Stellbrink[1], Edwin DeJesus[2], Sorana Segal-Maurer[3], Antonella Castagna[4], Anchalee Avihingsanon[5], **Benoit Trottier[7]**, Jose Luis Blanco Arevalo[6], Francesco Castelli[8], Andrea Antinori[9], Yazdan Yazdanpanah[10], Sylvie Ronot- Bregigeon[11], Hui Wang[12], Nicolas Margot[12], Hadas Dvory-Sobol[12], Martin S Rhee[12], Jared Baeten[12], Jean-Michel Molina[13]
[1]ICH Study Center Hamburg, Hamburg, Germany, [2]Orlando Immunology Center , Orlando, US, [3]New York Presbyterian Queens, New York, US, [4]IRCCS Ospedale San Raffaele, Milan, Italy, [5]Thai Red Cross AIDS Research Center (HIV-NAT) , Thailand, [6]Hospital Clinic de Barcelona, Barcelona, Spain, [7]Clinique de Médecine Urbaine du Quartier Latin , Montreal, Canada, [8]University of Brescia, Owensboro, US, [9]Lazzaro Spallanzani (IRCCS), Rome, Italy, [10]Hôpital Bichat-Claude, Paris, France, [11]Hôpital Sainte Marguerite, Marseille, France, [12]Gilead Sciences Inc., Foster City, US, [13]Hôpital Saint Louis, Paris, France

Lenacapavir (LEN), a potent first-in-class inhibitor of HIV-1 capsid function, is in development as a long-acting agent for treatment and prevention of HIV-1. In the ongoing Phase 2/3 study (CAPELLA) in heavily treatment-experienced (HTE) people with HIV-1 (PWH) with multidrug-resistance with ongoing viremia (≥ 400 copies/mL), (LEN) demonstrated potent antiviral activity during the functional monotherapy period (1.9 log decline) in combination with an optimized background regimen (OBR) at Week (W) 26.

In the randomized cohort, participants were randomized (2:1) to add oral LEN or placebo to their failing regimen. At Day 15 (D15), those on oral LEN received subcutaneous (SC) LEN (Q6M); those on placebo started the oral lead-in, followed by SC Q6M. In this cohort, participants initiated an OBR at D15. In the non-randomized cohort, participants initiated OBR concurrent with LEN (oral lead-in → SC). Subgroup efficacy analysis was conducted at W26 in the randomized cohort by baseline HIV-1 RNA, CD4, and OBR.

Total 72 participants enrolled: 36 randomized and 36 non-randomized. Median (range) number of prior antiretroviral (ARV) medications and ARV medications in the OBR were 11 (2, 25) and 4 (2, 7), respectively. At W26 in the randomized cohort, 81% (29 of 36) achieved HIV-1 RNA < 50 copies/mL. Rates of virologic suppression were high among participants who had low CD4 (< 200 cells/μL), INSTI resistance, and suboptimal OBR (≤1 fully active agent; not containing either dolutegravir or darunavir). Analysis is ongoing for the non-randomized cohort, as most have not yet reached W26.

In this heavily treatment experienced population with limited treatment options due to multidrug resistance (many with INSTI resistance), LEN demonstrated a clinically meaningful contribution towards virologic suppression in combination with an OBR.

54 Using a Personalized Measure to Identify Physical Health Challenges among People Living with HIV

Adria Quigley[1], Lesley Fellows[2], Marie-Josée Brouillette[1,2], Nancy Mayo[1,2]
[1]Mcgill University Health Center, Montreal, Canada, [2]McGill University, Montreal, Canada

Background: People living with HIV have more physical health challenges such as problems with fatigue, mobility, and gait relative to their HIV-negative counterparts. Physical challenges have received little attention in the literature despite being associated with an increased fall risk, greater mortality, and reduced health-related quality of life.

Objective: The purpose of this study is to estimate the prevalence of physical health challenges from areas that patients spontaneously report as substantially affecting their quality of life.

Methods: The patient generated index (PGI), a personalized health-related quality of life instrument, was administered to 809 people living with HIV drawn from the Brain Health Now cohort across five sites in Canada. In the PGI, participants are asked to indicate, in their own words, the five most important areas of their lives affected by HIV. PGI text threads were coded according to the World Health Organization's International Classification of Functioning, Disability, and Health (ICF). The rate and content of nominated physical health problems were tabulated.

Results: PGI text threads were coded to 18 domains of the ICF. 248 [31%; 95% CI (27.6, 33.9%)] of respondents nominated at least one physical health problem and 46 (6%) participants indicated two or more physical health problems. The most commonly nominated area was physical health unspecified (25% of total codes), followed by energy (22%), fatigue (11%), managing fitness (11%), endurance (7%), pain (5%), mobility (3.5%), sports participation (3%), effects of aging (3%), and walking (2%).

Conclusions: Physical health challenges are common among people living with HIV. Personalized health-related quality of life measures are well-suited to identify the unique physical challenges of people living with HIV and those potentially in need of a patient-centred rehabilitative approach.

69 Considerations for Developing and Implementing an Online Community-Based Exercise Intervention with Adults Living with HIV: a qualitative study

Bernice Lau[1], Isha Sharma[1], Sukhbir Manku[1], Julia Kobylianski[1], Li Yin Wong[1], Francisco Ibáñez-Carrasco[2], **Soo Chan Carusone[3,4]**, Kelly K. O'Brien[1,5,6]
[1]Department of Physical Therapy, Temerty Faculty of Medicine, University Of Toronto, Toronto, Canada, [2]Dalla Lana School of Public Health, University of Toronto, Toronto, Canada, [3]Casey House, Toronto, Canada, [4]McMaster Collaborative for Health and Aging, McMaster University, Hamilton, Canada, [5]Rehabilitation Sciences Institute (RSI), University of Toronto, Toronto, Canada, [6]Institute of Health Policy, Management and Evaluation (IHPME), Dalla Lana School of Public Health, University of Toronto, Toronto, Canada

Background: Community-based exercise (CBE) can enhance health outcomes among people living with HIV (PLWH). Despite the benefits, PLWH may experience barriers to exercising in traditional gym environments. Our objectives were to describe the need for and utility of online CBE interventions with adults living with HIV and identify factors to consider in developing and implementing an online CBE intervention with adults living with HIV.

Methods: We conducted a qualitative descriptive study using web-based semi-structured interviews with adults representing at least one of five stakeholder groups with experience in CBE and/or HIV: 1) adults living with HIV, 2) rehabilitation professionals, 3) fitness personnel, 4) educators with eLearning experience, and 5) representatives from HIV community-based organizations. We asked participants to describe their experiences with online CBE, need and utility for online CBE, and factors in developing and implementing online CBE interventions. We analyzed data using group-based content analytical techniques.

Results: Among the 11 participants, most had experience working with adults living with HIV (73%) or with tele-health/rehabilitation/coaching in HIV or other chronic conditions (91%). Participants identified the need and utility for online CBE interventions to increase accessibility and continuity of care with PLWH. Six factors to consider in developing and implementing online CBE included 1) person-specific considerations with adults living with HIV, 2) accessibility of program, 3) program delivery and technology, 4) attributes of program personnel, 5) program content and design, and 6) building community.

Conclusions: There is a need and utility for online CBE in the context of HIV. Considerations for development and implementation span individual, structural and technical, and community dimensions. Results can inform the future development and implementation of online CBE with adults living with HIV and other chronic episodic conditions.

70 Ongoing impact of the social determinants of health during the second and third waves of the COVID-19 pandemic in people living with HIV followed at a Montreal tertiary Care Centre

Abdulaziz Almomen[1], Joseph Cox[1], Bertrand Lebouché[1], Matthew P. Cheng[1], Charles Frenette[1], Jean-Pierre Routy[1], Abdulaziz Almomen[1], members of the Chronic Viral Illness Service[1]
[1]McGill University Health Centre, Montreal, Canada

Background: We previously reported that people living with HIV (PLWH) who developed COVID-19 during the first wave of the pandemic were often migrants with occupational exposure risk for SARS-CoV-2 acquisition. We describe the evolving risk profile and severity of SARS-CoV-2 infections for this population, in waves 2 and 3, comparing with previous findings and the general population in Montreal.

Methods: Retrospective chart review identified individuals with positive SARS-CoV-2 nasopharyngeal polymerase chain reaction (PCR) test/symptoms suspicious for COVID-19 from September 2020-August 2021, consistent with the 2nd and 3rd waves of the pandemic in Montreal. A descriptive analysis of extracted information (sociodemographic and economic information, risk factors for COVID-19, HIV-related clinical parameters, COVID-19-related symptoms, disease severity and clinical outcomes) was undertaken.

Results: 61 PLWH had a positive SARS-CoV-2 PCR (period prevalence of 0.04). More than half identified as black. The most common exposure risk for SARS-CoV-2 was having a family member/close contact with COVID-19(36%), followed by living in a long-term care (LTC) residence (10%) or working as a personal support worker, nurse or janitor in a health care institution (10%). Nearly all had mild disease on initial presentation, one was admitted to hospital for symptomatic COVID-19 and most had a full recovery. The cumulative incidence of COVID-19 at the CVIS was 0.0548, which was comparable to that in the general population in Montreal (0.06674) at that time.

Conclusion: COVID-19 among PLWH continues to affect ethno-racial communities disproportionately and members from these communities are more likely to have occupational risks for COVID-19. Similar to the Montreal population, the most common risk factor for SARS-CoV-2 exposure during waves 2 and 3 was having a household or close contact with COVID-19 whereas in wave one, working in a LTC home was the most frequent risk exposure. COVID-19 among PLWH appears to mirror observations regarding SARS-CoV-2 risks within the general populati

72 Safety of Estrogen Ring and/or Probiotics for Improving Vaginal Health in African/Caribbean/Black Women: Results from a Prospective, Randomized, Open-label, Intervention Phase I Trial (CTN 308)

Christina Hayes[1], Jenna Ratcliffe[1], Junic Wokuri[2], Gregor Reid[3], Rupert Kaul[4,5], Jesleen Rana[2], Muna Alkhaifi[2], Wangari Tharao[2], Fiona Smaill[6], Charu Kaushic[1]
[1]McMaster Immunology Research Centre and Department of Medicine, McMaster University, Hamilton, Canada, [2]Women's Health in Women's Hands Community Health Centre, Toronto, Canada, [3]Departments of Microbiology & Immunology and Surgery, Western University, and Canadian Research and Development Centre for Human Microbiome and Probiotics, The Lawson Health Research Institute, London, Canada, [4]Departments of Immunology and Medicine, University of Toronto, Toronto, Canada, [5]Department of Medicine, University Health Network, Toronto, Canada, [6]Department of Pathology and Molecular Medicine and Michael G. DeGroote Institute for Infectious Disease Research, McMaster University, Hamilton, Canada

Decreased Lactobacillus colonization and increased microbiota diversity in the vaginal tract are features of bacterial vaginosis (BV), which has a higher prevalence in African/Caribbean/Black (ACB) women and is associated with vaginal inflammation and increased risk of HIV infection. To modify these BV features, we investigated if administration of estradiol intravaginally alone or in combination with probiotics is safe in pre-menopausal women.

Forty-six ACB women aged 18-49 from the Toronto area enrolled in this phase I trial (CTN 308; Clinicaltrials.gov NCT03837015). Following collection of baseline samples, participants were randomized to: RepHresh™ Pro-B™ (1x10 [illegible] per capsule) probiotic vaginally twice daily in combination with the intravaginal estradiol Estring® (7.5µg/day), twice daily oral probiotics with the Estring, vaginal probiotics alone, or the Estring alone. Intervention was given for 30 days, and participants returned a week later for final assessment. Adverse events (AEs), blood glucose, complete blood count, comprehensive metabolic and lipid panels were used to evaluate safety.

A total of 83 AEs were reported by 27 (59%) participants, 59 (71%) of which were mild in intensity and 78 (94%) resolved by the end of the study. No severe AEs were reported. The most frequently reported AEs were vaginal irritation/burning/itching, cramps/abdominal pain, and headache. Vaginal irritation/burning/itching was the only AE reported more than once by multiple participants (5, 11%). Three (7%) participants reported cramps/abdominal pain, headache, light headedness and/or nausea of severe intensity 1-2 times, which resolved by study completion. Insomnia, vaginal irritation/itching, breast tenderness, and headache were ongoing at the end of the study for 3 (7%) participants. No clinically significant blood marker changes were observed.

No severe AEs were observed, and the majority of AEs were mild and short-term. Overall, administration of intravaginal estrogen and probiotics alone or in combination is safe.

73 Chronic Pain Prevalence and Characteristics Among Women Living with HIV and HIV-negative Women Participating in the British Columbia CARMA-CHIWOS Collaboration (BCC3) Study: Preliminary Data

Tetiana Povshedna[1,2], Shelly Tognazzini[3], Colleen Price[4], Amber R Campbell[5,6], Sofia LA Levy[5,6], Shayda A Swann[5,7], Elizabeth M King[5,8], Valerie Nicholson[3,9], Angela Kaida[3,5], Melanie CM Murray[5,6,10], Hélène CF Côté[1,2,5], on behalf of the BCC3 (CIHR, CTN 335) study team
[1]Department of Pathology and Laboratory Medicine, University of British Columbia, Vancouver, Canada, [2]Centre for Blood Research, University of British Columbia, Vancouver, BC, Canada, [3]Faculty of Health Sciences, Simon Fraser University, Burnaby, British Columbia, Canada, [4]Canadian HIV Trials Network - Chronic Pain and HIV Working Group, Global Pain and HIV Taskforce, [5]Women's Health Research Institute, British Columbia Women's Hospital and Health Centre, Vancouver, British Columbia, Canada,[6]Oak Tree Clinic, British Columbia Women's Hospital and Health Centre, Vancouver, British Columbia, Canada, [7]Experimental Medicine, The University of British Columbia Faculty of Medicine, Vancouver, British Columbia, Canada, [8]Department of Medicine, Faculty of Medicine, The University of British Columbia, Vancouver, British Columbia, Canada, [9]Epidemiology and Population Health, BC Centre for Excellence in HIV/AIDS, Vancouver, British Columbia, Canada,[10]Division of Infectious Diseases, Faculty of Medicine, The University of British Columbia, Vancouver, British Columbia, Canada,

Background: Chronic pain is common among people living with HIV, affecting quality of life, mental health, and clinical care. Data describing chronic pain among women living with HIV (WLWH) are limited. This interim analysis describes chronic pain prevalence and characteristics among WLWH and HIV-negative control women.

Methods: The BC CARMA-CHIWOS Collaboration (BCC3) study examines healthy aging among WLWH in British Columbia. We used the Brief Chronic Pain Questionnaire (BCPQ) to screen for chronic pain, then validated survey instruments to describe chronic pain alongside questions about mental health, medication/substance use, sleep quality, and resilience (see Table 1). Groups were compared by t-test, Chi-Squared test, and logistic regression.

Results: Between January-November 2021, 66 WLWH and 64 controls (mean age 48.9±12.2 vs. 44.1±15.5, p=0.049) completed the survey. WLWH were more likely to screen as having chronic pain on the BCPQ (41% vs 23%, p=0.04), however the difference disappeared after adjusting for age. WLWH most frequently reported pain in lower back (70%), neck (52%), upper back (41%), and foot/ankle (37%). Controls reported pain in shoulder (53%), lower leg (47%), neck (47%), and abdomen (40%). Table 1 summarizes the study observations.

Conclusions: In this limited sample, we did not observe differences in chronic pain prevalence among WLWH vs. controls. Both groups appear to show substantial coping abilities despite high pain intensity and interference, and similar substance use to cope with pain. Further analysis of chronic pain correlates in the fully enrolled BCC3 cohort will help inform action(s) to improve quality of life for WLWH.

Supporting Document

Table 1. Pain and participant characteristics among those who fulfilled the BCPQ criteria for chronic pain.	**WLWH (n=27)**	**HIV-negative control women (n=15)**
Parameters from the Pain, Enjoyment of Life, and General Activity (PEG) Scale		
Pain on average last week (>5 on a 0-10 scale), n (%)	20 (74)	13 (87)
Pain interference with enjoyment of life (>5 on a 0-10 scale), n (%)	15 (56)	11 (73)
Pain interference with general activity (>5 on a 0-10 scale), n (%)	16 (59)	10 (67)
Parameters from the body manikin for pain localization		
Number of affected regions (median [IQR])	7 [3-11]	8 [2-13]
Widespread pain prevalence*, n (%)	5 (19)	4 (27)
Parameters from newly developed BCC3 survey questions		
Medication use to cope with pain (prescribed or over the counter), n (%)	24 (89)	11 (73)
Substance use to cope with pain, n (%)	15 (56)	8 (53)
Any mental health diagnosis related to chronic pain? n (%)	13 (50)	8 (53)
Pain interferes with quality of sleep, n (%)	20 (77)	12 (80)
Support in place to help navigate the chronic pain journey, n (%)	16 (59)	10 (67)
Parameters from the Pain Self-Efficacy Questionnaire (PSEQ)		
“I can cope with my pain in most situations” (>3 on a 0-6 scale), n (%)	17 (63)	11 (73)
“I can still do many of the things I enjoy doing, such as hobbies or leisure activity, despite the pain” (>3 on a 0-6 scale), n (%)	14 (52)	10 (67)
“I can still accomplish most of my goals in life, despite the pain” (>3 on a 0-6 scale), n (%)	17 (63)	9 (60)
“I can live a normal lifestyle, despite the pain” (>3 on a 0-6 scale), n (%)	17 (63)	9 (60)
*Widespread pain was defined based on 2019 American College of Rheumatology criteria.		

78 Disjunction between self-perceived and clinically-assessed HIV risk among urban gay, bisexual, other men who have sex with men (GBM) in Ontario and British Columbia

Oscar Javier Pico Espinosa[1], Mark Hull[2], Paul MacPherson[3], Daniel Grace[4], Mark Gaspar[4], Nathan Lachowsky[5], Kevin Woodward[6], Saira Mohammed[2], Karla Fisher[7], Simon Rayek[8], Camille Arkell[9], Tyllin Cordeiro[10], Garfield Durrant[11], Warren Greene[12], David Hall[13], Matthew Harding[14], Jody Jollimore[15], Marshall Kilduff[16], John Maxwell[17], Leo Mitterni[18], Eric Peters[19], Robinson Truong[1], Darrell Tan[1]

[1]St. Michael's Hospital, Unity Health Toronto, Toronto, Canada, [2]BC Centre for Excellence in HIV/AIDS, Vancouver, Canada, [3]University of Ottawa, Ottawa, Canada, [4]University of Toronto, Toronto, Canada, [5]University of Victoria, Victoria, Canada, [6]McMaster University, Hamilton, Canada, [7]Toronto General Hospital, Toronto, Canada, [8]Health Initiative for Men, Vancouver, Canada, [9]Canadian AIDS Treatment Information Exchange (CATIE), Toronto, Canada, [10]Alliance for South Asian AIDS Prevention (ASAAP), Toronto, Canada, [11]Black Coalition for AIDS Prevention (Black CAP), Toronto, Canada, [12]Canadian Aboriginal AIDS Network, Fort Qu'Appelle, Canada, [13]Vancouver Coastal Health, Vancouver, Canada, [14]MAX Ottawa, Ottawa, Canada, [15]Community-Based Research Centre, Vancouver, Canada, [16]AVI Health and Community Services, Victoria, Canada, [17]AIDS Committee of Toronto, Toronto, Canada, [18]Hassle Free Clinic, Toronto, Canada, [19]The Gay Men's Sexual Health Alliance, Toronto, Canada

Background: Individuals' self-perception of HIV risk does not always align with the risk assessments generated by clinical screening tools. We compared self-perceived versus clinically assessed risk of HIV and reasons for perceived low risk among GBM from large cities in Ontario and British Columbia.

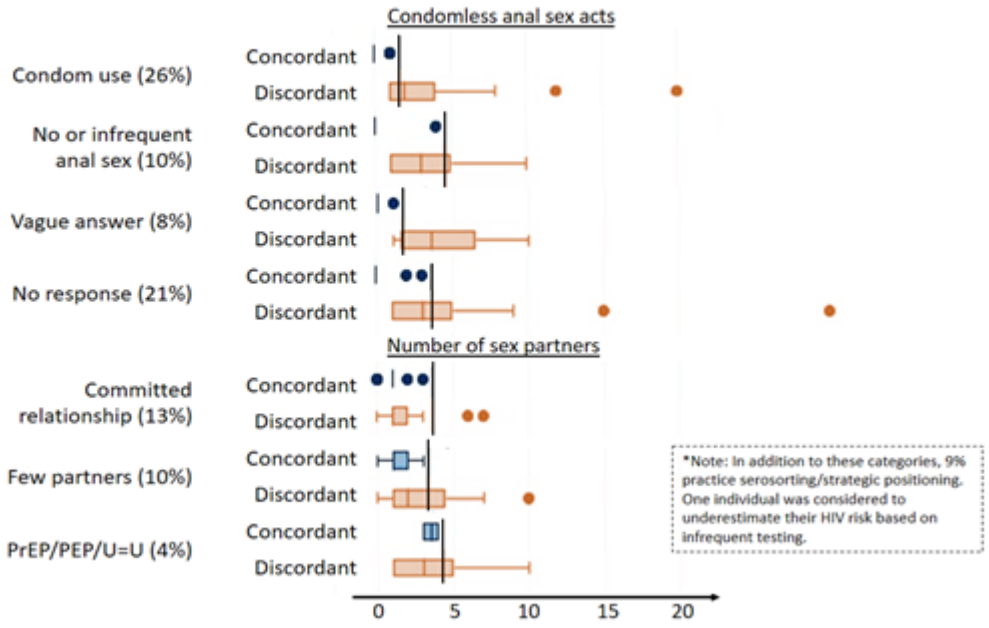
Methods: Cross-sectional survey between July/2019 and August/2020. Among never PrEP users, we contrasted self-assessed HIV risk against criteria from the Canadian PrEP guideline: condomless anal sex in the past six months with any of the following: a HIRI-MSM score>11, syphilis, rectal gonorrhea/chlamydia, post-exposure prophylaxis (PEP) use>2. Participants provided a written explanation of their self-assessment, including their strategies to avoid HIV infection. The main themes were compared with number of sex partners and number of condomless anal sex acts; those with numbers exceeding the highest values of their peers, were considered to be possibly underestimating their HIV risk.

Results: Of 315 participants who perceived themselves to be at low risk, 146 (46%) were considered at high risk based on criteria from the Canadian PrEP guideline (labeled "discordant"). Reasons for perceiving themselves at low risk of HIV in the discordant group included: condom use, being in a committed relationship/having one main partner, no or infrequent anal sex and having few partners (Figure). We estimated that 39% may, possibly, underestimate their HIV risk (Figure).

Conclusions: More efforts to increase GBM's HIV risk awareness and of evidence-based HIV prevention options are needed. Contextualizing individuals' sexual behaviours in relation to that of their peers could aid efforts to increase PrEP uptake.

Supporting Document

Figure. Condomless anal sex acts or number of sex partners in the past six months stratified by strategy used to prevent HIV.
The black vertical black lines signal the highest reported value in the concordant group. Individuals with values to the right of the vertical black line were considered to be, possibly, underestimating their HIV risk.



80 Feasibility of Estrogen Ring and/or Probiotics for Improving Vaginal Health in African/Caribbean/Black Women: Results from a Prospective, Randomized, Open-label, Phase I Trial (CTN 308)

Jenna Ratcliffe[1], Junic Wokuri[2], Christina L. Hayes[1], Gregor Reid[3], Rupert Kaul[4,5], Jesleen Rana[2], Muna Alkhaifi[2], Wangari Tharao[2], Fiona Smaill[6], Charu Kaushic[1]
[1]McMaster Immunology Research Centre and Department of Medicine, Hamilton, Canada, [2]Women's Health in Women's Hands Community Health Centre, Toronto, Canada, [3]Departments of Microbiology & Immunology and Surgery, Western University, and Canadian Research and Development Centre for Human Microbiome and Probiotics, The Lawson Health Research Institute, , London, Canada, [4]Departments of Immunology and Medicine, University of Toronto, Toronto, Canada, [5]Department of Medicine, University Health Network, Toronto, Canada, [6]Department of Pathology and Molecular Medicine and Michael G. DeGroote Institute for Infectious Disease Research, Hamilton, Canada

Background: Bacterial vaginosis (BV) is a common clinical condition, characterized by a Lactobacillus diminished polymicrobial vaginal microbiota, inflammation of the lower female reproductive tract, and elevated risk of HIV infection. Multiple studies have shown that African/Caribbean/Black (ACB) women have higher prevalence of polymicrobial microbiota compared to Caucasian and Asian women. To determine if administration of probiotics and estrogen is an acceptable intervention to improve vaginal health, a prospective, randomized, open-label, intervention phase I trial (CTN 308) was conducted.

Methods: Pre-menopausal adult ACB women from the Toronto area received low dose intra-vaginal estradiol (Estring [illegible] 7.5 g/day), a twice daily [illegible] of L. rhamnosus GR-1 and L. reuteri RC-14 per capsule), or a combination of Estring and oral or vaginal probiotic for 30 days (ClinicalTrials.gov NCT03837015). Trial feasibility was assessed by evaluating enrolment and retention rates, and intervention protocol (IP) adherence rates.

Results: Between November 2019 and August 2021, 57 ACB women from the Toronto area were screened, 46 enrolled, and 38 completed the study. Of enrolled participants, 9 (20%) reported at least one past episode of BV. 81% of screened participants were enrolled and the retention rate was 83%, exceeding targets of 70% and 80%, respectively. Five (11%) participants withdrew consent and 3 (6%) withdrew due to IP non-compliance prior to completing the study. Of those that completed the study, IP adherence was high among all treatment groups, with an overall Estring adherence rate of 93% (12% SD, IQR 92%-100%), a vaginal probiotic adherence rate of 90% (16% SD, IQR 87%-100%), and an oral probiotic adherence rate of 92% (8.0% SD, IQR 87%-99%).

Conclusion: Enrolment, retention and adherence rates suggest twice daily probiotics and/or low dose intravaginal estrogen are acceptable interventions. Analysis of biological samples will determine whether the intervention can successfully enhance Lactobacillus colonization.

81 Doxycycline as an Intervention for Bacterial Sexually transmitted infection ChemOprophylaxis (DISCO) study: Design of a national, multicentre randomized-controlled trial

Saira Mohammed[1], Mark Hull[1,2], Ann N. Burchell[3,4], Joshua Edward[5], Joel Singer[2], Jason Wong[2,5], Bill Cameron[6], Sharmistha Mishra[3], Marc Romney[2,7], Joseph Cox[8], Sébastien Poulin[9], John Gill[10], Caley Shukalek[10], Paul MacPherson[6], Muhammad Morshed[2,5], Wanrudee Isaranuwatchai[3], David Hall[11], Jennifer Gillis[2], Mark Gilbert[5], Richard Lester[2], Darrell H.S. Tan[3,4], Troy Grennan[2,5]
[1]BC Centre for Excellence in HIV/AIDS, Vancouver, Canada, [2]University of British Columbia, Vancouver, Canada, [3]St. Michael's Hospital, Unity Health Toronto, Toronto, Canada, [4]University of Toronto, Toronto, Canada, [5]BC Centre for Disease Control, Vancouver, Canada, [6]Ottawa Hospital Research Institute, Ottawa, Canada, [7]St. Paul's Hospital/Providence Health Care, Vancouver, Canada, [8]Université McGill, Montreal, Canada, [9]CMU-Quartier Latin, Inc., Montreal, Canada, [10]University of Calgary, Calgary, Canada, [11]Vancouver Coastal Heallth, Vancouver, Canada

Background: Bacterial sexually transmitted infections (STI) (syphilis, chlamydia and gonorrhea) have been increasing dramatically, disproportionately affecting gay, bisexual, and other men who have sex with men (gbMSM). Novel tools are needed to prevent STIs and reduce complications. The antibiotic doxycycline has shown promise in preventing STIs in small studies but were not adequately powered to fully address drug efficacy in the prevention of bacterial STIs. Thus, a comprehensive study is warranted on doxycycline for STI prevention to definitively assess efficacy, safety, and antimicrobial resistance (AMR) – a potential, risk factor of unclear significance. The DISCO study will assess efficacy, tolerability, and acceptability of doxycycline in preventing incident bacterial STIs over the long-term.

Methods: This prospective, open-label, three-arm randomized controlled trial will enroll 447 sexually-active, adult gbMSM and transgender women with a recent (≤12 months) STI from clinical sites in Vancouver, Calgary, Montreal, Toronto, Ottawa, and Hamilton. Randomization will occur in 1:1:1 ratio: STI pre-exposure prophylaxis (PrEP; daily doxycycline 100mg); STI post-exposure prophylaxis (PEP; doxycycline 200mg within 72h of exposure, to a maximum of 600mg weekly); standard-of-care (no doxycycline). Follow-up visits occur quarterly to Week 60. Primary outcome is incident STIs over the study period. Secondary outcomes include organism-specific STI incidence, treatment-emergent adverse events, changes in sexual-risk behaviour, AMR patterns of commensal nasopharyngeal organisms, tetracycline resistance in gonorrhea, and medication adherence.

Anticipated Results: We hypothesize that doxycycline as both STI-PrEP and -PEP will be efficacious in preventing incident STIs compared to standard-of-care, and that doxycycline will be an acceptable, well-tolerated intervention with little-to-no impact on AMR.

Conclusion/Significance: This large-scale, RCT will be the first intervention study to do a head-to-head comparison of STI PrEP and PEP, with the potential to provide evidence of their efficacy, safety, and AMR to reduce the impact of STI-related complications among gbMSM and transgender women.

93 Improving Vaginal Health for HIV-1 Prevention: Comparison of Different Collection Methods for Vaginal Microbiota Profiling to Analyze Molecular Bacterial Vaginosis

Christina Hayes[1], Jocelyn Wessels[1], Elizabeth Tevlin[1], Anisha Garga[1], Kristen Mueller[1], Haley Dupont[1], Fiona Smaill[2], Wangari Tharao[3], Charu Kaushic[1]
[1]McMaster Immunology Research Centre and Department of Medicine, McMaster University, Hamilton University, Hamilton, Canada, [2]Department of Pathology and Molecular Medicine and Michael G. DeGroote Institute for Infectious Disease Research, McMaster University, Hamilton, Canada, [3]Women's Health in Women's Hands Community Health Centre, Toronto, Canada

The vaginal microbiota (VMB) plays a critical role in mediating vaginal inflammation, barrier function, and susceptibility to sexually transmitted infections. Profiling the VMB can elucidate mechanisms through which the VMB affects clinical outcomes such as bacterial vaginosis.

To determine which VMB sampling method(s) provide high quality, consistent VMB profiles, a cross sectional study comparing VMB sampling methods was designed with ethics approval from the McMaster Human Ethics Board. Following informed consent, 23 cervicovaginal lavages (CVLs), corresponding vaginal swabs taken by a nurse, as well as 14 participant collected vaginal swabs were obtained from women aged 19-35 from the GTA.

Extracted DNA was subjected to 16S rRNA gene and V3-V4 region nested PCR, then Illumina MiSeq sequencing to examine the VMB. Amplicon sequence variants were generated by DADA2, taxonomy assigned using SILVA, and sequencing depth, alpha and beta diversity, as well as relative abundances were assessed in RStudio. Kruskal-Wallis with Dunn's post hoc tests were performed in GraphPad. 16S rRNA sequencing depth of VMB samples ranged from 3928-53717 reads and was not significantly different between the three sampling methods (p=0.85).
No significant differences in inverse Simpson diversity index values were observed between sampling methods (p=0.81) as values were low (<3.5), except 2 participants had values >5 for each sample. Principal coordinate analysis using Bray-Curtis dissimilarity depicts most samples clustering by the participant regardless of the sampling method.

Correspondingly, the bacteria identified was consistent between sampling methods from each participant, with some differences in relative abundances. Lactobacillaceae relative abundance was >90% in all samples, exception for 1 self swab (79%), 1 participant with a high abundance of Sneathia amnii, and 2 participants with polymicrobial profiles.

Overall, CVLs, nurse and self-collected vaginal swabs are all suitable sampling methods for consistent VMB profiling by 16S rRNA gene sequencing, enabling mixing of different sampling methods.

98 Attention in early school-aged children who are HIV-exposed uninfected

Julia Young[1,2], Vanessa Chen[2], Ari Bitnun[3,4], Stanley Read[3,4], Mary Lou Smith[1,2,5]
[1]Department of Psychology, The Hospital for Sick Children, Toronto, Canada, [2]Neurosciences and Mental Health Program, Research Institute, The Hospital for Sick Children, Toronto, Canada, [3]Division of Infectious Diseases, The Hospital for Sick Children, Toronto, Canada, [4]Department of Pediatrics, University of Toronto, Toronto, Canada, [5]Department of Psychology, University of Toronto Mississauga, Mississauga, Canada

Purpose: Children born to mothers living with HIV are perinatally exposed to antiretroviral drugs (ARVs). Research has demonstrated that these children are at risk for cognitive and language delays. Attention is important for optimal behavioural, cognitive, and academic skills, yet has not been thoroughly investigated in children who are HIV-exposed uninfected (CHEU) in comparison to children who are HIV-unexposed uninfected (CHUU).

Methods: Fifty-five CHEU and 51 CHUU children were recruited at 5.5 years of age from the Hospital for Sick Children and the community, respectively. Parent-reported attention deficit hyperactivity disorder (ADHD) Rating Scale-IV yielded scores on inattention (IA), hyperactivity/impulsivity (HI), and combined scores. Recommended cutoff scores were used to predict the presence of probable ADHD. Additional neurodevelopmental measures of intelligence, visuomotor skills, academics, and adaptive functioning were obtained. Analyses examined between-group differences in attention measures, neurodevelopmental measures, and demographic factors. Additional correlational and multiple regression models, accounting for maternal education and employment, were performed.

Results: The percentages of children who met clinical cut-offs for probable ADHD were low (3.6% CHEU, 2.0% CHUU). No differences in measures of IA, HI, and combined scores were found between CHEU and CHUU children. HEUs scored significantly lower on intelligence, visuomotor function, academic skills, and aspects of adaptive behavior. Lower Full-Scale IQ and Processing Speed scores were associated with higher IA scores in the CHEU group, and lower adaptive functioning scores were associated with higher IA scores in the CHUU group. Across both cohorts, children of unemployed mothers had more HI symptoms.

Conclusions: CHEU children were not at increased risk for attention difficulties at 5.5 years of age. The significance of maternal employment status in predicting attention problems, irrespective of group, highlights the contribution of sociodemographic factors in shaping children's early behaviour and neurodevelopment.

99 Behavioural and emotional functioning of school-aged children who are HIV-exposed, uninfected: A preliminary study

Julia Young[1,2], Jason Brophy[3,4], Lena Serghides[5,6], Ari Bitnun[7,8], Mary Lou Smith[1,2,9]
[1]Department of Psychology, The Hospital for Sick Children, Toronto, Canada, [2]Neurosciences and Mental Health Program, Research Institute, The Hospital for Sick Children, Toronto, Canada, [3]Division of Infectious Diseases, Children's Hospital of Eastern Ontario, Ottawa, Canada, [4]Department of Pediatrics, University of Ottawa, Ottawa, Canada, [5]Toronto General Hospital Research Institute, University Health Network, Toronto, Canada, [6]Department of Immunology and Institute of Medical Sciences, Toronto, Canada, [7]Division of Infectious Diseases, The Hospital for Sick Children, Toronto, Canada, [8]Department of Pediatrics, University of Toronto, Toronto, Canada, [9]Department of Psychology, University of Toronto Mississauga, Mississauga, Canada

Purpose: The present study investigated parent and child ratings of behavioural and emotional difficulties in children who are HIV-exposed uninfected (CHEU) and children who are HIV-unexposed uninfected (CHUU).

Methods: CHEU and CHUU 6 to 10 years of age underwent developmental assessments through the Kids Imaging and Neurocognitive Development (KIND) study at the Hospital for Sick Children in Toronto, Canada between January 2020 and December 2021. A parent questionnaire, the Strengths and Difficulties Questionnaire (SDQ), evaluated aspects of problem behaviours. A self-report questionnaire, the Spence Children's Anxiety Scale (SCAS), evaluated symptoms of anxiety. Clinically significant symptoms were identified, and group differences were evaluated using t-tests. Significance was held at $p < 0.05$.

Results: Thirty-two CHEU (17 female, 8.53 ±1.55 years) and 30 CHUU (12 female, 8.46 ±1.54 years) children were included. Results from the SDQ indicated a greater number of CHEU (15.6%) with high parent-rated total behavioural difficulties compared to CHUU (0%). Higher scores of total behavioural difficulties ($p=0.04$) and emotional problems ($p=0.03$) were identified in CHEU compared to CHUU. A subset of children, 23 CHEU (12 female, 9.05 ±1.21 years) and 22 CHUU (10 female, 8.99 ±1.42 years) completed the SCAS. Six children in each group (26% CHEU and 27% CHUU) were identified with clinically significant levels of total anxiety symptoms. About half of these children (47.8% CHEU and 54.5% CHUU) rated clinically significant symptoms of an anxiety subtype, physical injury fears. No between-group differences in anxiety subtype T-scores were identified.

Conclusions: Parents of CHEU identified more total behavioural difficulties compared to parents of CHUU. Self-reported anxiety symptoms were similar between groups. The data were largely collected after the onset of the COVID19 pandemic, which may have contributed to anxiety symptoms. The prevalence of individual parent and self-rated concerns warrants ongoing monitoring and intervention of behavioural and emotional functioning.

104 “We did the body scan and, immediately, I could feel this blackness, this darkness, this fear”: two experiences of adverse effects during a mindfulness course for people living with HIV

Graeme Donald[1], Kelly Birtwell[1]
[1]*University Of Manchester, Manchester, United Kingdom*

Background: Mindfulness is becoming increasingly popular across Canada and beyond, and there is growing evidence that mindfulness can improve the mental wellbeing of people living with HIV (PLWH). However, little is known about adverse effects from mindfulness in this population. Cross-sectional and population-based studies show that meditation-related adverse effects are common in the general population, yet they are underreported in clinical trials of mindfulness-based interventions.

Aim: To explore the experiences of PLWH who experienced adverse effects during an 8-week mindfulness-based stress reduction course (MBSR).
Method: Semi-structured interviews were conducted with two participants who withdrew from an MBSR course. Data were originally collected and analysed as part of Positively Mindful, a mixed methods feasibility trial of MBSR for PLWH. We re-analysed interview transcripts using Interpretive Phenomenological Analysis in order to more fully explore the experiences of adverse effects.

Findings: Participants described their experiences of adverse effects and related these to their history of past trauma. They identified what they considered to be triggers for the adverse effects and reflected on the acceptability and safety of mindfulness-based interventions given their experiences. Participants thought the screening criteria were sufficient although they felt there was limited support for their experiences of adverse effects from within the MBSR course. Experiences of adverse effects did not negatively impact the perception of MBSR as a psychological intervention. The findings highlight the tension between motivation to engage and capacity to engage in particular mindfulness practices.

Conclusion: Improving understanding and knowledge of the adverse effects of mindfulness will enable clinicians and patients to weigh the risks and benefits and make informed choices about utilising mindfulness-based interventions. Furthermore, our findings highlight the importance of trauma-informed and person-centred approaches to mindfulness. Our findings are therefore relevant to clinicians and patients across Canada and globally.

106 Measures Of Retention in HIV Care: A Study Within a Systematic Review

Nadia Rehman[1], Michael Wu[2], Michael Garcia[1], Alvin Leenus[3], Hussein El-Kechen[1], Lawrence Mbuagbaw[1,4,5]
[1]Health Research Methodology, Department of Health Research Methods, Evidence and Impact (HEI), McMaster University, Hamilton , Canada, [2]Michael G. DeGroote School of Medicine, McMaster University, Hamilton, Canada, [3] Faculty of Health Sciences, McMaster University, Hamilton, Canada, [4]Biostatistics Unit, Father Sean O'Sullivan Research Centre, St Joseph's Healthcare, Hamilton , Canada, [5]Centre for Development of Best Practices in Health (CDBPH), Yaoundé Central Hospital, Yaoundé, Cameroon

Background & Purpose: A big challenge in treating people with HIV is poor retention in care, which leads to negative health outcomes.

Objective: This study aims to describe the diversity in definitions used for retention in HIV care in randomized controlled trials.

Methods: We conducted a study within a systematic review (SWAR). We reported definitions of retention in HIV care grouped by similarities. Descriptive statistics including frequencies and percentages were used to describe the include trials.

Data sources: Data were drawn from an overview of systematic reviews to improve the HIV care cascade.1 We updated the search strategy from November 2019 by searching for additional trials published up to November 2020.

Study selection: Randomized controlled trials of interventions to improve retention in people with HIV.

Data extraction and synthesis: Data were screened and extracted in duplicate, with arbitration as needed. Randomised trials were identified by a team of reviewers. We reported definitions of retention in HIV care narratively and in tables.

Results: A total of 45 articles were retrieved from the search strategy developed for the overview of reviews1 along with our updated search strategy.

Descriptive statistics: Over 31% (n=11) of the trials were conducted in high-income countries. In total, 91% (n=41) articles provided a definition. These definitions were assigned into 14 categories based on how retention is defined. The categories with the highest number of definitions were continuity in care and pharmacy refill. There was no homogeneity found in the definitions in between the categories or within each category.

Limitations and Strengths: Some categories are not mutually exclusive. The strengths include a comprehensive and exhaustive search, and the novelty of the research question.

Conclusion: There is a need for more uniform definitions of retention in HIV care in clinical trials to inform policy and facilitate evidence synthesis.

108 A New Rapid Antiretroviral Start Program in Edmonton, Alberta, Canada: A Retrospective Review of Outcomes in the First 18 months Post Implementation

Arif Ismail[1], **Stephen Shafran[1]**, Shannon Turvey[1]
[1]Division of Infectious Diseases, Department of Medicine, University of Alberta, Edmonton, Canada

Background: Rapid start of antiretroviral therapy (ART) for patients newly diagnosed with HIV reduces time to virologic suppression (VS) and hence transmission. Evaluation of rapid start programs in Canada may help identify at-risk populations and target future interventions.

Methods: We performed a retrospective review of the rapid start ART program at the largest HIV clinic in Edmonton, Alberta from inception (September 2019) to February 2021. All patients with a new HIV diagnosis were included and cases were followed for at least 6 months. Patient demographics, time from positive HIV report to first clinic visit, time to ART initiation, and time to VS (viral load < 200 copies/mL) and MD follow-up visit were recorded. We compared subgroups by ethnicity, residence, and presence of health coverage to analyze the impact of demographic factors on outcomes.

Results: 65 patients were identified. Twenty (30%) were Indigenous and 20 (30%) were Caucasian. Median time from positive HIV report to intake visit was significantly longer for Indigenous compared to Caucasian patients (24 vs 13.8 days, p = 0.014). ART (INSTI-containing in 64) was initiated within 24 hours of visit in 66% and within 7 days in 78%. We documented VS in 61 (93.8%) patients, with a median of 35 days. Time to VS was longer in Indigenous than Caucasian patients (median 55.5 vs 35 days, p = 0.007), and in those living outside Edmonton versus in Edmonton (77.6 vs 48.7 days, p = 0.014). Median time to MD follow-up was longer for Indigenous than Caucasian patients (54 vs 46 days, p = 0.083), but this was not statistically significant.

Conclusions: Implementation of a rapid start ART program in Edmonton has had demonstrated success, with 94% of patients achieving VS in under 60 days. Targeted interventions should address Indigenous and non-Edmonton residents' barriers to access care.

126 Diagnosis of Esophageal Varices in Virus-Related Advanced Chronic Liver Disease

Jordana Serero[1], Amine Zoughlami[1], Stephen Congly[2], Irene Zhao[4], Julie Zhu[3], Alnoor Ramji[5], Curtis Cooper[6], Philip Wong[1], Robert Bailey[7], Carla Coffin[2], Giada Sebastiani[1]
[1]Mcgill University, Montreal, Canada, [2]University of Calgary, Division of Gastroenterology & Hepatology, Calgary, Canada, [3]Dalhousie University, Halifax, Canada, [4]University of Calgary, Calgary, Canada, [5]University of British Columbia, Vancouver, Canada, [6]University of Ottawa, Ottawa, Canada, [7]University of Alberta, Edmonton, Canada

HIV, hepatitis C (HCV) and hepatitis B (HBV) viruses represent major causes of compensated advanced chronic liver disease (cACLD). Development of esophageal varices (EV) impacts cACLD prognosis and eophagogastroduodenoscopy (EGD) is the gold standard for their diagnosis. We compared Baveno VI/expanded Baveno VI criteria, which combine liver stiffness measurement (LSM) with platelets, and simple fibrosis biomarkers to diagnose EV needing treatment (EVNT) in virus-related cACLD.

CanHep B Network and LIVEHIV cohorts were utilized to perform a cross-sectional analysis in 2014-2020. Inclusion criteria were: cACLD diagnosis (LSM>10 kPa), EGD, and platelets within 1 year of LSM. Baveno VI (LSM<20 kPa and platelets>150,000) and expanded Baveno VI criteria (LSM<25 kPa and platelets>110,000) were tested for EGD sparing. Diagnostic performance of these criteria against EGD was computed and compared to FIB-4, APRI and AST-to-ALT ratio (AAR). Optimized cut-offs of these biomarkers to diagnose EVNT were established by using AUC analysis.

340 patients were included. Prevalence of any EV & EVNT was 32.8% & 8.8% in the whole cohort (31.3% & 2.6% in HIV patients, 30.2% & 9.3% in HBV and 35% & 13% in HCV, respectively). Both Baveno VI and expanded Baveno VI criteria performed well in patients with virus-related cACLD (see Table). The optimized cut-offs for fibrosis biomarkers were: FIB-4 3.3, APRI 1.5, AAR 1.0. There was no difference on performance of the fibrosis biomarkers compared to LSM-based criteria.

This supports the use of non-invasive criteria based on LSM and platelets and simple fibrosis biomarkers to spare unnecessary EGD in virus-related cACLD.

Supporting Document

TABLE 1: Performance of non-invasive criteria for prediction of EVNT.

	Sensitivity (%)	**Specificity** (%)	**NPV** (%)	**PPV** (%)	**Spared EGD** (%)	**EVNT missed** (%)
HIV (n=104)						
Baveno VI	80	22	92.8	8	20.4	1.6
Extended Baveno VI	80	40.7	96	10.2	31.2	1.6
FIB-4	100	68.9	100	8	60.5	0
APRI	50.0	56.7	98.1	2.5	68.4	1.3
AAR	50.0	47.3	97.2	2.5	47.4	1.3
HBV (n=86)						
Baveno VI	100	32.1	100	13.1	29.1	0
Extended Baveno VI	75.0	56.4	96.6	15.0	51.1	2.3
FIB-4	75.0	72.0	96.4	22.2	67.5	2.4
APRI	62.5	84	95.5	29.4	79.5	3.6
AAR	75.0	46.7	94.5	13.0	44.6	2.4
HCV (n=150)						
Baveno VI	100	12	100	25	23	0
Extended Baveno VI	89	46	98	15	43	2.5
FIB-4	73.0	75.3	92.0	19.2	65.5	2.3
APRI	62.5	84.0	93.1	29.4	74.2	3.6
AAR	75.0	49.0	89.0	13.0	35	4.6

140 Changes in nonalcoholic fatty liver disease spectrum and metabolic markers in people with HIV after switching to a raltegravir-based regimen

Mohamed Shengir[1], Wesal Elgretli[2], Bertrand Lebouche[3], Sahar Saeed[4], Agnihotram Ramanakumar[5], Andreas Giannakis[3], Alexandra De Pokomandy[3], Joseph Cox[3], Cecilia Costiniuk[3], Jean-Pierre Routy[3], Marina Klein[3], Giada Sebastiani[1,3]
[1]Division of Experimental Medicine, McGill University , Montreal, Canada, [2]Department of Medicine, Faculty of Medicine, University of Tripoli, Tripoli, Libya, [3]Chronic Viral Illness Service, McGill University Health Center, Montreal, Canada, [4]Institute for Public Health, Washington University , St. Louis, United States, [5]Research Institute, McGill University Health Center, Montreal, Canada

Background. Nonalcoholic fatty liver disease (NAFLD) is a major comorbidity among people with HIV (PWH). Its aggressive nature in such population, mandates exploring less steatogenic antiretroviral therapies (ART). We aimed to evaluate the effect of switching to raltegravir (RAL) based regimen on NAFLD, BMI, and lipids among PWH with NAFLD.

Methods. In this phase IV, open–label RCT (ClinicalTrials.gov: NCT02210715), PWH without viral hepatitis coinfection were randomized 1:1 to switch arm (RAL 400mg BID) and control arm (continuing any other ART not containing integrase inhibitors). Patients with suppressed HIV viral load and NAFLD (controlled attenuation parameter (CAP)≥238 dB/m) at baseline were included. Outcomes were evaluated as changes between baseline and 24 months of follow–up. Liver fibrosis was measured as liver stiffness by Fibroscan. Nonalcoholic steatohepatitis (NASH) was determined using cytokeratin–18 (CK–18). Changes in outcomes were represented as standardized mean differences (SMD). A fixed–effect linear regression model was applied to compare outcomes between both study arms.

Results. 31 PWH were included (mean age 53.9yrs). Compared to baseline, SMD of AST decreased in switch vs control arm (switch -9.54, control 5.57 p=0.036). In the adjusted multivariate model, NASH and liver fibrosis improved in switch compared to control arm. However, these observations were not significant when comparing both arms (see Table). No changes in BMI and lipids were observed.

Conclusions. This study indicated that switching to RAL improves AST and may potentially alleviate the progression of NASH and fibrosis. However, larger interventional studies are needed to conclude the same.

Supporting Document

Table. A fixed–effect linear model comparing control arm to switch arm using noninvasive tools for liver steatosis and fibrosis. (CAP=controlled attenuation parameter; LSM=liver stiffness measurement; CK–18=cytokeratin 18; APRI=AST–to–Platelet Ratio Index; FIB–4=fibrosis–4).

Variables	Univariate model		Multivariate model*	
	coefficient	p-value	coefficient	p-value
Δ CAP (24 months – baseline)				
Control group	-0.349	0.6147	-0.641	0.4013
Switch group	-0.729	0.3189	-0.450	0.5547
Difference in slope		0.7110		0.8853
Δ LSM				
Control group	0.117	0.8263	0.063	0.0306
Switch group	-0.050	0.1376	-0.050	0.1376
Difference in slope		0.7279		0.8853
Δ CK–18				
Control group	-0.379	0.6506	-1.242	0.1254
Switch group	-2.394	0.0450	-2.407	0.0649
Difference in slope		0.1995		0.4500
Δ APRI				
Control group	0.002	0.3718	0.0003	0.8792
Switch group	0.0003	0.8377	0.001	0.3418
Difference in slope		0.5362		0.8486
Δ FIB-4				
Control group	-0.232	0.2551	-0.276	0.2563
Switch group	0.0003	0.8377	-0.221	0.3184
Difference in slope		0.9823		0.9735

*The multivariate model is adjusted for ALT & BMI.

145 The Patient Generated Index as an Early-warning System for Predicting Brain Health Challenges: A Prospective Cohort Study for People Living with HIV

Muhammad Mustafa Humayun[1], Nancy Mayo[1]
[1]*McGill University, Montreal, Canada*

Objective: In research people are often asked to fill out questionnaires about their health and functioning. It is common that these questionnaires contain items that reflect serious health concerns. Typically, these concerns are not identified until the statistician analyses the data. An alternative is to use an individualized measure where people are asked to self-nominate areas of concern which can then be dealt with in real-time. The relevance of this approach to identify mental health concerns has not been explored in people aging with HIV.

Objective: Estimate the extent to which a self-nomination of areas related to mood, anxiety, and cognition on the PGI predict the presence or emergence of depression, anxiety, or cognitive impairment among people living with HIV at baseline and for successive assessments over 27-months.

Methods: The data comes from participants enrolled in the Positive Brain Health Now (+BHN) cohort (n=856). The nominated areas were category coded to a sentiment framework. A longitudinal design was used to link self-nominated sentiments to presence or emergence of anxiety, depression, or low cognitive ability as assessed using standardized measures of these constructs. Logistic regressions were used to estimate the goodness of fit of each model using the c-statistic.

Results: The sentiments categorized as ‘emotional’ predicted all of the mental health outcomes at all visits with adjusted odds ratios (OR) ranging from 1.61 to 2.00 and c-statistics >0.73 (good to excellent prediction). Nominating an anxiety sentiment was specific to predicting anxiety and mental health (OR: 1.65 & 1.52); nominating a cognitive concern was specific to predicting self-reported cognitive concerns (OR: 4.78). Positive sentiments predictive of good cognitive function (OR: 0.36).

Conclusions: This study indicates the value of using this semi-qualitative approach as an early-warning system in predicting brain health outcomes from spontaneously nominated life areas within the Patient Generated Index (PGI).

148 Differences in adherence behaviors depending on timing of HIV acquisition

Suzanne Marcotte[1], Valérie Martel-Laferrière[3,4,5], Bertrand Lebouché[7], Anne-Geneviève Genest[6], **Suzanne Marcotte**[2,3,5]

[1]Hôpitaux Universitaires de Marseille - AP-HM, Marseille, France, [2]Department of pharmacy, Centre Hospitalier de l'Université de Montréal (CHUM), Montréal, Canada, [3]Centre de recherche du Centre Hospitalier de l'Université de Montréal (CRCHUM), Montréal, Canada, [4]Division of Microbiology and Infectious Diseases, Centre hospitalier de l'Université de Montréal (CHUM), Montréal, Canada, [5]Université de Montréal (UdeM), Montréal, Canada, [6]Centre intégré de santé et de services sociaux de la Montérégie-Centre, Greenfield Park, Canada, [7]McGill University Health Centre (MUHC), Montréal, Canada

Our study compares adherence depending on HIV acquisition at infancy/childhood versus adolescence/early adulthood. All patients under 30 years living with HIV, followed in three Canadian centers were included: patients with HIV diagnosed before age of 10 years (group 1) (n=66) and patients diagnosed between 10 and 25 years (group 2) (n=62).

A chart review was conducted to collect data on treatment adherence according to physician, immunovirologic control and resistance. An electronic survey was sent to evaluate self-reported adherence, causes of non-adherence, and willingness to use an injectable regimen. With the retrospective chart review, we did not find a statistically significant association between group and treatment adherence (83% vs. 90%; p=0.24).

Patients with poor or insufficient adherence to therapy were more at risk of poor or incomplete efficacy (aOR, 68.90; 95%CI [16.4-289.5]). There were significantly more patients with good immunological and virological ART efficacy in group 2 (93.5% vs. 78.8%; p=0.02). We observed significantly more ART classes impacted by resistance mutations in group 1 (0.89±1.10 vs. 0.29±0.69, p=0.002). On the basis of resistance, there is a trend for more eligible patients for long-acting injectable cabotegravir/rilpivirine in group 2 (90.3% vs 80.3%, p=0.12).

With the electronic survey, we did not find a statistically significant association between group and treatment adherence considering the number of missed pills over seven days (0.56±1.12 vs. 0.20±0.40, p=0.13). Patients in group 2 seemed to be more interested in the injectable treatment than patients in group 1 (73.3% vs. 56.3%, p=0.32).

Despite similar adherence in both groups, we were able to confirm that immunological/virological efficacy is less often achieved and that HIV presents more pharmacological resistance in the group infected from childhood. Even though many young patients may be interested in long acting injectable antivirals, it is important to consider previous genotypes to ensure eligibility.

152 The Impact of Integrase Inhibitors on Glycemic Control in Patients with HIV and Diabetes

Pierre Giguere[1,2,3], Chandni Sehgal[5], Salmaan Kanji[1,2,3], Jill Trinacty[4], Jonathan Angel[1,2,3]
[1]The Ottawa Hospital, Ottawa, Canada, [2]Ottawa Hospital Research Institute, Ottawa, Canada, [3]Faculty of Medicine, Univeristy of Ottawa, Ottawa, Canada, [4]Bruyere Research Institute, Ottawa, Canada, [5]Nova Scotia Health Authority, Halifax, Canada

Background: An association between integrase strand transfer inhibitors (InSTIs) and the development of diabetes mellitus (DM) has been reported. Here we describe the development of new DM, and the worsening of DM in patients with pre-existing DM, after exposure to selected InSTIs

Methods: Adults with HIV and DM who received dolutegravir, bictegravir or elvitegravir for at least 1 month were eligible for this observational study. Patients were excluded if they had gestational DM or steroid-induced hyperglycemia. Patient demographics, clinical characteristics and DM outcome of new diagnosis or DM worsening (defined as an increase in HbA1c by ≥ 0.5% and/or the addition of new antihyperglycemic medication) were recorded from the time of most recent exposure to selected InSTIs between November 2012 and March 2021. A univariate analysis was conducted to compare clinical characteristics between those with worsening versus no worsening DM.

Results: We identified 142 patients with HIV and DM, of which 86 patients met inclusion criteria. Over an average follow up of 3.6 years from the initiation, switch between or change to an InSTI, 35 patients (40.7%) were newly diagnosed, 39 (45.3%) had a worsening and 12 (14%) did not have a worsening of DM. The time from InSTI exposure to new diagnosis or worsening was a median [IQR] of 619 [352, 885] and 330 [256, 404] days, respectively. The median absolute increase in HbA1c was by 2.1% and 1.5% in the new diagnosis and worsening groups, respectively. Weight gain was also observed in both groups. Age, gender, region of origin, InSTI and TAF use did not differ between groups.

Conclusion: This is the first analysis that describes a worsening of DM after exposure to selected modern InSTIs. New diagnoses and worsening of DM were common in our patient population and occurred over a relatively short time frame

156 Progress Toward 90-90-90 Targets for Persons Living with HIV in Newfoundland and Labrador (NL)

Debbie Kelly[1], Kayla Holder[2], Kimberley Burt[3], Erin Ding[4], Diana Kao[4], Jason Trigg[4], Bob Hogg[4,5], Jatin Morkar[3], Michael Grant[2]
[1]School of Pharmacy, Memorial University, St. John's, Canada, [2]Faculty of Medicine, Memorial University, St. John's, Canada, [3]Eastern Health, St. John's , Canada, [4]British Columbia Centre for Excellence in HIV/AIDS, Vancouver, Canada, [5]Faculty of Health Sciences, Simon Fraser University, Burnaby, Canada

Background: The HIV program in NL provides care for all persons living with HIV (PLWH) in NL, yet progress toward 90-90-90 goals for diagnosis, linkage to care and viral suppression has not previously been documented. This analysis describes engagement in HIV care and virologic outcomes for the NL cohort in 2016 and 2019 and compares 2016 NL cohort data to the Canadian HIV Observational Cohort (CANOC).

Methods: A retrospective review of the NL clinic was performed. Individuals were considered under care and included if they were adults aged 18 years or older with at least one CD4 and one viral load (VL) measurements in the calendar year of study. Descriptive statistics for demographics, risk factors, and clinical variables were assessed and variables compared using $\chi 2$ test or Fisher's Exact test (categorical) or Wilcoxon Sum Rank test (continuous).

Results: Characteristics of the NL HIV cohort remained consistent between 2016 and 2019 but differed significantly from CANOC (Table 1). Engagement in care and virologic outcomes were consistently from 2016 to 2019: 100% engaged in care (no change), 99% and 98% on antiretroviral therapy (ART), and 92% and 94% VL suppression. Cascade of care parameters were higher for NL than for CANOC: 100% vs. 88% engaged in care ($p<0.001$), 99% vs. 87% on ART ($p<0.001$), and 92% vs. 76% VL suppression (NS).

Conclusions: Despite being an older cohort and living with HIV longer, engagement in care and virologic outcomes among PLWH in NL is high and compares favorably to a national cohort.

Supporting Document

Table 1: Characteristics and Comparisons of the NL Cohort in 2016 and 2019 and with CANOC (2016)

Characteristic	Category	Descriptive Statistics					
		CANOC 2016 n = 11768		NL 2016 n = 177		NL 2019 n = 188	
		n	(%)	n	(%)	n	(%)
Age (years)	Median (IQR)	47 (38-54)		50 (44-55)†		53 (46-57)	
Gender	Male	9744	(83)	137	(77)	143	(76)
	Female	1963	(17)	40	(23)	44	(23)
	Transgender	55	(0)	0	(0)	1	(1)
	Unknown	6	(0)	0	(0)	0	(0)
HIV Risk Behaviour	MSM	5669	(48)	91	(51)	100	(53)
	Heterosexual	2538	(22)	78	(44)†	71	(38)
	IDU	2478	(21)†	19	(11)	14	(7)
	Blood products	177	(2)	4	(2)	5	(3)
	Endemic Country	726	(6)†	11	(6)	16	(9)
	Vertical Transmission	8	(0)	1	(1)	2	(1)
HIV Duration (years)	Median (IQR)	8 (4-13)		13 (4-22)†		15 (6-25)	
Age of Starting cART (years)	Median (IQR)	39 (32-47)†		37 (31-45)		37 (31-46)	
Duration on cART (years)	Median (IQR)	6 (3-10)		11 (3-18)†		11 (5-21)‡	
Hepatitis C (ever coinfected)	Coinfected ever	2644	(22)†	20	(11)	19	(10)
Hepatitis B (ever coinfected)	Coinfected ever	1314	(11)	17	(10)	18	(10)
Ever Diagnosed with Cancer	Yes	380	(3)	15	(8)†	17	(9)
Ever Diagnosed with AIDS-defining Illness	Yes	2208	(19)	41	(23)	46	(24)

†Denotes $P < 0.05$ and significant 95% confidence for odds ratio for CANOC vs. NL (2016) and associated with probability of cohort more likely to have the higher value.
‡Denotes $P < 0.05$ and significant 95% confidence for odds ratio for NL (2016) vs. NL (2019) and associated with probability of cohort more likely to have the higher value.

158 Transition Outcomes for Adolescents Living with HIV in Eastern Ontario – A Single-Centre Review

Julia Hunter-Schouela[1,2], Branka Vulesevic[3,4,5], Jonathan Angel[4,5,6], Jason Brophy[2,7]
[1]Dept. of Pediatrics, Children's Hospital of Eastern Ontario, Ottawa, Canada, [2]Dept. of Pediatrics, University of Ottawa, Ottawa, Canada, [3]CIHR Canadian HIV Trials Network , [4]Ottawa Hospital Research Institute, Ottawa, Canada, [5]The Ottawa Hospital, Ottawa, Canada, [6]University of Ottawa, Ottawa, Canada, [7]HIV Clinic Program, Division of Infectious Diseases, Children's Hospital of Eastern Ontario, Ottawa, Canada

Background: With combination antiretroviral therapy, children living with HIV now survive to transition into young adults living with HIV (YLWH). Research has shown that transition from pediatric to adult care is associated with poor outcomes, increased mortality, loss to follow-up (LTFU), and decreased treatment adherence. We describe retention in care and health outcomes of Canadian YLWH transitioned from pediatric HIV care at CHEO to adult HIV care at The Ottawa Hospital (TOH).

Methods: Retrospective review was performed on those meeting eligibility criteria: entered TOH care between 1999-2019, HIV acquired/diagnosed in childhood, engagement in pediatric HIV care before transfer, and seen at TOH HIV clinic at least once post-transfer. LTFU was defined as not seen for ≥12 months at the time of data collection. Data collected included: viral loads (VL), CD4 counts, incidence of mental illness and substance use, and treatment adherence.

Results: We describe 22 transitioned patients (10 cis-females, 12 cis-males), median age of 18 years at the time of transition. Median CD4+ count was 521 cells/μL at first visit and 290 at 3 years post-transition. 9/22 (41%) had detectable VL at time of transition, versus 5/20 (25%) at 3 years. 63% reported substance use (marijuana, alcohol, narcotics), and 45% had experienced mental illness (anxiety, depression or schizophrenia). Half remained in care at TOH, while the remainder were LTFU. One patient died. Treatment adherence was intermittent in 18/22 (82%) patients. In the LTFU group, the shortest period in care was 138 days and the longest was 11 years (median 4.7 years).

Conclusion: In this study, long-term survivors of pediatric HIV demonstrated high levels of difficulties remaining on treatment and in care, with significant burden of substance use and mental health problems. Future research should probe YLWH's transition experiences and determine factors that predict success or failure of the transition process.

160 Patient-Reported Outcomes After Switching to a 2-Drug Regimen of Fixed-Dose Combination Dolutegravir/Lamivudine: 48-Week Results From the SALSA Study

Princy Kumar[1], Amanda E. Clarke[2], Celia Jonsson-Oldenbüttel[3], Miguel García Deltoro[4], Simona Di Giambenedetto[5], Carlos Brites[6], Laurent Hocqueloux[7], Po-Liang Lu[8], James Oyee[9], Alan Oglesby[10], Julie Priest[10], Elizabeth Blair[10], Brian Wynne[10], Lori A. Gordon[10], Emilio Letang[11], Jean van Wyk[11], Lee A. Evitt[11], **Elise Sasseville[12]**

[1]Georgetown University Medical Center, Washington, United States, [2]Royal Sussex County Hospital and Brighton & Sussex Medical School, Brighton, United Kingdom, [3]MVZ Karlsplatz, Munich, Germany, [4]Infectious Disease Service, Consortium General University Hospital of Valencia, Valencia, Spain, [5]Fondazione Policlinico Universitario Agostino Gemelli IRCCS, UOC Malattie Infettive, and Dipartimento di Sicurezza e Bioetica, Sezione di Malattie Infettive, Università Cattolica del Sacro Cuore, Rome, Italy, [6]Universidade Federal da Bahia, Salvador, Brazil, [7]Centre Hospitalier Régional d'Orléans, , Orléans, France, [8]Kaohsiung Medical University, Kaohsiung, Taiwan, [9]GlaxoSmithKline, Brentford, United Kingdom, [10]ViiV Healthcare, Research Triangle Park, United States, [11]ViiV Healthcare, Brentford, United Kingdom, [12]Clinique Urbaine Medical du Quartier Latin, Montreal, Canada

Introduction: In SALSA (NCT04021290), switching to the 2-drug regimen (2DR) dolutegravir/lamivudine (DTG/3TC) had non-inferior efficacy compared with continuing 3- or 4-drug (3/4DR) current antiretroviral regimen (CAR) in treatment-experienced adults.

Objectives: We present Week 48 patient-reported health outcomes from SALSA.
Materials and Methods: SALSA is a randomized, open-label study of virologically suppressed adults on stable 3/4DR for ≥3 months who switched to DTG/3TC or continued CAR for 52 weeks. Secondary endpoints were change from baseline in patient-reported treatment satisfaction and symptom bother, assessed by HIV Treatment Satisfaction Questionnaire (HIVTSQ) and symptom distress module (SDM), respectively, at Weeks 4, 24, and 48.

Results: The DTG/3TC (N=246) and CAR (N=247) groups had similar baseline HIVTSQ total scores (median [range]: DTG/3TC, 58.0 [24-60]; CAR, 58.0 [34-60]) and lifestyle/ease (DTG/3TC, 29.0 [8-30]; CAR, 29.0 [15-30]) and general satisfaction/clinical sub-scores (DTG/3TC, 29.5 [12-30]; CAR, 29.0 [17-30]). Mean increases in HIVTSQ total score and lifestyle/ease and general satisfaction/clinical sub-scores through Week 48 were higher in the DTG/3TC vs CAR group (Table). Baseline SDM scores were comparable between groups (median [range]: DTG/3TC, 6.0 [0-59]; CAR, 4.0 [0-47]). The DTG/3TC group had small improvements in SDM score compared with CAR at Weeks 4 and 24 and a similar SDM score at Week 48.

Conclusion: Participants switching to DTG/3TC reported greater early improvements in treatment satisfaction and less symptom distress compared with those continuing CAR, observed at 4 weeks and persisting through Week 48. These findings further support greater patient satisfaction with use of the 2DR DTG/3TC vs 3/4DRs.

Supporting Document

Table. Adjusted Mean Change From Baseline in HIVTSQ Total Score, Lifestyle/Ease Sub-score, and General Satisfaction/Clinical Sub-score and SDM Bother Score by Visit

		Adjusted mean change from baseline (95% CI)[a]			
Time from baseline	**Treatment**	**HIVTSQ total score**	**HIVTSQ lifestyle/ease sub-score**	**HIVTSQ general satisfaction/clinical sub-score**	**SDM bother score**
Week 4	DTG/3TC	1.9 (1.4, 2.4)	0.9 (0.6, 1.2)	1.0 (0.7, 1.3)	−1.9 (−2.7, −1.1)
	CAR	0.2 (−0.5, 0.9)	0.1 (−0.3, 0.5)	0.1 (−0.3, 0.5)	−0.7 (−1.5, 0.1)
	Difference[b]	1.8 (0.9, 2.6)	0.8 (0.4, 1.3)	0.9 (0.4, 1.3)	−1.2 (−2.3, −0.1)
Week 24	DTG/3TC	2.6 (2.1, 3.1)	1.3 (1.0, 1.6)	1.3 (1.0, 1.6)	−2.3 (−3.3, −1.3)
	CAR	1.2 (0.7, 1.7)	0.6 (0.3, 0.9)	0.6 (0.3, 0.9)	−0.7 (−1.6, 0.2)
	Difference[b]	1.4 (0.7, 2.2)	0.8 (0.4, 1.2)	0.6 (0.2, 1.0)	−1.6 (−2.9, −0.2)
Week 48	DTG/3TC	2.6 (2.1, 3.1)	1.4 (1.1, 1.7)	1.2 (0.9, 1.5)	−2.3 (−3.2, −1.4)
	CAR	1.2 (0.6, 1.8)	0.7 (0.4, 1.0)	0.5 (0.2, 0.8)	−1.8 (−2.7, −0.9)
	Difference[b]	1.4 (0.7, 2.2)	0.7 (0.3, 1.1)	0.7 (0.3, 1.1)	−0.5 (−1.8, 0.7)

For HIVTSQ, high scores represent greater treatment satisfaction (range, 0-60); for SDM, low values indicate less symptom bother (range, 0-80).

[a]Adjusted mean is the estimated mean change from baseline at each visit in each group calculated from mixed-model repeated measures adjusting for treatment, visit, baseline third agent class, age (continuous), sex, race, baseline value (continuous), treatment-by-visit interaction, and baseline value-by-visit interaction, with visit as repeated factor. [b]Difference (DTG/3TC – CAR) in adjusted mean change for each measure.

161 Assessing Canadian HIV clinicians' awareness of the Canadian HIV Pregnancy Planning Guidelines: Identifying the need for broader dissemination to ensure guideline implementation

VL Kennedy[1], **Hajar Seiyad[1]**, Laura Warren[1], Chris Battiston[1], Yvonne Blonde[2], Pam Nickel[3], Michaeline McGuinty[4], Tamera Stilwell[5], Daniel Sheppard[6], Mona Loutfy[1]
[1]Women's College Hospital, Toronto, Canada, [2]University of Saskatchewan, Saskatoon, Canada, [3]Alberta Health Services, Edmonton, Canada, [4]Ottawa Hospital Research Institute, Ottawa, Canada, [5]BC Women's Hospital Health Centre, Vancouver, Canada, [6]Nova Scotia Health Authority, Halifax, Canada

Introduction: HIV reproductive planning is informed by science and patient preferences. In 2018, a transdisciplinary team re-developed the Canadian HIV Pregnancy Planning Guidelines (CHPPG) – an evidence-based clinical guideline on HIV pregnancy planning. Our objectives were to explore Canadian HIV clinicians' awareness and implementation of the CHPPG and willingness to counsel on pregnancy planning, as well as educational interest.

Methods: REDCap surveys were distributed by AMMI, CHAP, CANAC, and a novel listserv of 'other' HIV clinicians (mostly family physicians). Main outcomes included the proportion of Canadian HIV clinicians that were aware of the CHPPG, and whether those who were aware had implemented the CHPPG. Additional outcomes measured include willingness to counsel and interest in potential educational opportunities on the topic.

Results: Seventy-five participants initiated the survey [27 pharmacists (36%), 25 family physicians (33.3%), 9 infectious disease physicians (12%), 8 nurse/nurse practitioners (11%), and 6 other clinicians (8%)]. Forty-five (60%, p=0.46) participants were aware of the CHPPG; however, 21/45 (46.7%) hadn't read it. Awareness of the guidelines varied across professionals; nurse respondents were the most likely to report being aware (6/7, 87.5%; NS). Of those who were aware and had read it, 20/24 (83.3%) reported using the guidelines. 52.5% (n=35/67) of respondents had provided pregnancy planning counselling in the prior 12 months; 3/32 (9.4%) respondents who hadn't provided pregnancy planning counselling in the prior 12 months were unwilling to. 56/67 (83.6%) respondents expressed interest in learning more about pregnancy planning and HIV indicating that they were somewhat/very interested.

Conclusions/implications: Canadian HIV clinicians have limited awareness of the CHPPG; implementation is similarly limited. However, willingness to offer HIV pregnancy planning counselling and interest in learning more on this topic were high. Opportunities for dissemination of the CHPPG among Canadian HIV clinicians are required to ensure care based on the best available evidence.

162 The Quebec Commercial Infant Formula Program for families affected by HIV [Le Programme provincial de préparation commerciale pour nourrissons (P3CN) des Centres d'infectiologie mère-enfant du Québec (CIME_Q)]

Suzanne Taillefer[1], Maire-Michèle Poirier[1], Christos Karatzios[2], Marie-Astrid Lefebvre[2], Roseline Thibeault[4], Marie-Claude Beaudoin[4], Isabelle Alarie[3], Cybèle Bergeron[3], **Isabelle Boucoiran[1]**, Fatima Kakkar[1]
[1]CHU Sainte-justine, Université De Montréal, Montreal, Canada, [2]McGill University Health Centre, Montreal, Canada, [3]CIUSSS de l'Estrie-CHUS, Université de Sherbrooke, Sherbrooke, Canada, [4]CHU de Québec-Université Laval, Quebec, Canada

Background: While exclusive formula feeding remains the preferred method for feeding infants born to women living with HIV (WLWH) in Canada, families can face several obstacles with infant feeding, including financial barriers. Here, we report on the impact of a free formula program for families living with HIV in the province of Quebec, launched on April 1st, 2021.

Methods: The Quebec Commercial Infant Formula Program for families affected by HIV (P3CN) was developed by CIME_Q, a multidisciplinary and multisite group of infectious diseases specialists, pediatric and adult care providers, pharmacists and nurses, and funded by Quebec's Ministry of Health. It offers to refund the costs of infant formula to pharmacies or directly to families affected by HIV during the first year of life of their baby. The management of the program is centralized at the CHU Sainte-Justine. Data regarding HIV perinatal transmission were extracted from the Quebec HIV perinatal registry (CIME_Q), which captures all mother-infant pairs affected by HIV in pregnancy in the province of Quebec since 2017.

Results: Between 2017-2020, there were 202 live births among WLHW captured in CIME_Q's registry. Of them, 2 (1%) chose to breastfeed. There were 2 cases of perinatal infection (unrelated to breastfeeding). Since April 2021, 35 WLWH part of the CIME_Q registry delivered in Quebec; among them, 33 benefited from P3CN, one had access to free formula through another program and one decided to breastfeed. Considering that some families whose infants were born before the program's implementation were eligible (<1 y.o.), 59 families in total have benefited from free infant formula so far, at a mean cost of $2080 per year per family. There were no perinatal transmissions.

Conclusions: Since implementation of P3CN, uptake has been high. Further work is underway to evaluate the implementation of the program and women's experiences with it.

171 Bone Health of Aging HIV Infected Women

Sharon Walmsley[1], Joel Singer[2], Angela Chung[1], Sylvie Trottier[3], Fiona Smaill[4], Alexandra De Pokomandy[5], Brian Conway[6], Antonella Castagna[7], Rosemarie Clarke[1], Terry Lee[8], Giovanni Guaraldi[9]

[1]University Health Network, Toronto, Canada, [2]The University of British Columbia, Vancouver, Canada, [3]Chu de Québec-Université Laval, Quebec City, Canada, [4]McMaster University Medical Centre, Hamilton, Canada, [5]McGill University Health Centre, Montreal, Canada, [6]Vancouver Infectious Diseases Centre, Vancouver, Canada`, [7]Ospedale San Raffaele, Milan, Italy, [8]CIHR Canadian HIV Trials Network, Vancouver, Canada, [9]University of Modena and Reggio Emilia, Modena, Italy

Background: Bone health can be impacted by aging, HIV and antiretroviral therapy (ART).

Methods: A cross sectional analysis of baseline bone health of women participating in a switch study of tenofovir (TDF) to tenofovir alafenamide (TAF). Canadian and 10 Italian women enrolled in the peri- (48%) or _Data was collected from 34 participants, 24 early post-menopausal (52%) period. The median age 51 years, 58.8% black, 38.2% Caucasian. 12% current and 18% former smokers, median 16.5 years HIV diagnosis and 14 years ART. Median CD4 cell count was 570/mm3 (nadir 168); all had viral suppression. 17.6% had a prior HCV diagnosis.

The median BMI was 26. 15% were using calcium and 59% vitamin D supplements. No participant had ever received therapy for osteoporosis. 8.8% received hormonal replacement therapy. 21% reported a prior fracture and 20% reported having one or more falls in the previous 6 months. The baseline median score on the short performance physical battery test was 11, with 23% in the intermediate and 77% in the high performance level.

The median baseline grip strength was 27.3 (normal). Based on DEXA scan the median (IQR) bone mineral density (BMD) at the lumbar spine was 0.916 (0.804, 1.053) and at the femoral neck was 0.741 (.692, .845) both below normal. At baseline the median FRAX fracture risk score for 10-year probability for a major osteoporotic fracture was 4.4 (2.7, 5.0). The median (IQR) 10-year probability for hip fracture was based on DEXA was 0.2 (0.1, 0.5).

Conclusions: Low BMD was identified in the majority of our older HIV cohort of women on TDF. Although performance measures were in the intermediate to high range, falls were common. Hip fracture risk estimate varied with the calculator. Aging HIV infected women should have regular BMD scans to determine the need for anti-resorptive therapy.

172 Trends in Obesity Among People Living with HIV: Beyond Return to Health

Eimear Fitzpatrick[1], Leah Szadkowski[1], Alice Zhabokritsky[1], Sharon Walmsley[1]
[1]*University Health Network, Toronto, Canada*

Background: Antiretroviral therapy (ART) enabled people living with HIV (PLWH) to maintain or regain weight as part of a "return to health" phenomenon. More recent trends suggest that many PLWH have gained excessive weight as seen in the general population. We sought to explore the change in proportion of PLWH with obesity over time.

Methods: The data base of the Toronto General Hospital Immunodeficiency Clinic was screened for PLWH with more than one documented body mass index (BMI) between 2000-2021. When >1 BMI was recorded within a calendar year, the highest value was used. BMI was modeled using univariable and multivariable linear Generalized Estimating Equations with an exchangeable correlation matrix, adjusting for calendar year, age, gender, and race.

Results: A total of 2314 PLWH were included in the analysis. Median (IQR) age was 56 (46-62), 81% male, and 51.6% white. The proportion with obesity (defined as BMI >=30) increased from 9.4% in 2000 to 28.5% in 2021. Increasing calendar year was associated with higher BMI (adjusted β=0.11, 95% confidence interval 0.09, 0.14, per year) after adjusting for age, gender, and race.

Conclusion: Obesity rates are increasing among PLWH. This could contribute to an increased risk of metabolic syndrome and associated complications. The role of HIV-specific contributors to weight gain, such as ART is under investigation. PLWH need regular counselling on strategies to achieve and maintain healthy weight.

Supporting Document

	Univariable		Multivariable	
	β (95%CI)	p	β (95%CI)	p
Per Calendar Year	0.1 (0.08, 0.11)	<0.0001	0.1 (0.08, 0.11)	<0.0001
Age (per year)	0.02 (0.01, 0.04)	<0.01	0.04 (0.02, 0.06)	<0.0001
Female/Trans (Ref. Male)	1.75 (1.15, 2.36)	<0.0001	1.34 (0.68, 2)	<0.0001
Race				
White	Ref.		Ref.	
Black	1.6 (1.1, 2.11)	<0.0001	1.18 (0.63, 1.73)	<0.0001
Other	-0.57 (-1.03, -0.12)	0.01	-0.72 (-1.18, -0.26)	<0.01
Unknown	1.24 (-1.72, 4.2)	0.41	0.6 (-2.34, 3.54)	0.69

174 Patient experiences with HIV/AIDS care in Ontario: Findings from the OHTN Cohort Study (OCS)

Nahid Qureshi[1], Kristen O'Brien[1], Claire Kendall[2,3], Beth Rachlis[3], Mark McCallum[4], Gordon Arbess[5], Robert Alsberry[6], Sharon Johnston[2,8], Abigail Kroch[1,7,9]
[1]The Ontario HIV Treatment Network, Toronto, Canada, [2]Bruyère Research Institute, Ottawa, Canada, [3]ICES, Toronto, Canada, [4]OCS Governance Committee, Toronto, Canada, [5]Unity Health Toronto, Toronto, Canada, [6]MAX Ottawa, CATIE, and/or Black Gay Men's Network of Ontario, Ottawa, Canada, [7]Dalla Lana School of Public Health, University of Toronto, Toronto, Canada, [8]University of Ottawa, Ottawa, Canada, [9]Public Health Ontario, Toronto, Canada

Background: For people living with HIV (PLWH), their evaluation of care can help identify unmet needs. Understanding those experiences is essential to providing high quality patient-centered care.

Method: The Ontario HIV Treatment Network Cohort Study is a longitudinal cohort study of PLWH who receive care at HIV clinics in Ontario. We examined, cross-sectionally, data on the care experiences of OCS participants (January 2019-December 2020). HIV care and services were evaluated on a scale of 'excellent/very good/good' to 'fair/poor'. The services of non-HIV providers (possibly specialists, ER, other family doctors) were assessed on a scale of 'often/always' to 'never/rarely/sometimes'.

Results: Of the 1691 participants, 94% visited their primary HIV provider in the past year, of whom, 97% evaluated their recent visit as 'excellent/very good/good'. 98% rated how clinic staff worked together (providing care and maintaining privacy) 'excellent/very good/good'. Almost all participants (99%) reported that they were confident in their primary HIV provider's knowledge treating HIV. 29% of respondents experience some challenge in accessing HIV care. The top challenges were related to transportation expenses, delays in getting appointments and health-related accessibility. 19% travelled an hour or more to their HIV clinic. Patient satisfaction was lower with some services provided by non-HIV providers. This included 87% who reported that their non-HIV providers were often/always aware of their medical history and 88% who reported that their non-HIV providers often/always had adequate knowledge of HIV to provide treatment/care.

Conclusion: HIV patients have complex needs across systems. While participants were satisfied with their care, they indicated less satisfaction for non-HIV providers due to gaps in communication. While participants indicate high quality HIV care, their care is largely in HIV specialty clinics. With challenges in travel, the expansion of virtual care and e-consult could improve access to high quality care for people living with HIV in Ontario.

181 Predicting the willingness of people living with HIV to use a patient portal using a random forest model

Dominic Chu[1,2], Bertrand Lebouché[1,2,3,4], David Lessard[2,3,4], Yuanchao Ma[2,3,4,5], Karine Lacombe[6], Hayette Rougier[7], Kim Engler[2,3,4], Anish Arora[1,2], Nadine Kronfli[3,4], Joseph Cox[2,3,4], Tarek Hijal[8], Serge Vicente[2,3,9], Alexandra De Pokomandy[1,3,4], Nancy L. Sheehan[4,10], Jean-Pierre Routy[4], Tibor Schuster[1]

[1]Department of Family Medicine, McGill University, Montreal, Canada, [2]Canadian Institutes of Health Research Strategy for Patient-Oriented Research Mentorship Chair in Innovative Clinical Trials in HIV, Montreal, Canada, [3]Centre for Health Outcomes Research, Research Institute of the McGill University Health Centre, Montreal, Canada, [4]Department of Medicine, Division of Infectious Diseases and Chronic and Viral Illness Service, McGill University Health Centre, Montreal, Canada, [5]Department of Mechanical Engineering, Polytechnique Montréal, Montreal, Canada, [6]Sorbonne université, Inserm IPLESP, Hôpital St Antoine, APHP, Paris, France, [7]IMEA, Institut de Médecine et d'Epidémiologie Appliquée, Paris, France, [8]Division of Radiation Oncology, McGill University Health Centre, Montreal, Canada, [9]Département de mathématiques et statistiques, Université de Montréal, Montréal, Canada, [10]Faculté de pharmacie, Université de Montréal, Montréal, Canada

Purpose: Patient portals offer patients access to their electronic medical record and have shown a positive impact on engagement in care. To configure a patient portal for use in HIV care in Canada and France, it is important to identify and predict factors related to people living with HIV's (PLWH) willingness to use such a portal.

Methods: A cross-sectional survey was administered to patients receiving HIV care at HIV-specialized clinics of the McGill University Health Center (Montreal, Canada) and Saint-Antoine Hospital (Paris, France) between September 2019 and February 2020. A random forest analysis with 500 classification trees was conducted to explore patient-level factors that predict willingness to use a patient portal. Pertinent candidate covariates identified in prior literature included age, gender, income, education, and technology self-efficacy. Imbalances in representation of respective outcome categories (willing vs not willing to use a patient portal) were weighted to uniformly maximize both sensitivity and specificity.

Results: A total of 114 PLWH completed the survey. Their mean age was 47.8 years old (SD=12.4) and 74% were men. The variables indicating statistically relevant capability for predicting patients' willingness to use a patient portal were gender, income, and age. PLWH who identified as women (73%), PLWH with an annual income over $60 000 CAD (70%), and PLWH below the age of 31 (81%) were more willing to use a patient portal than their counterparts. Patient experience with health technology (86% with no experience; 68% with experience), and capability to use health technology (79%) were also identified as important factors.

Conclusions: Our analyses offer insight on predictive variables for willingness to use a patient portal in HIV care. These variables are useful to identify early adopters, while also revealing a need to tailor implementation to reach potential users facing difficulties accessing or using connected technologies.

182 Understanding the benefits and risks of a patient portal configured for HIV care: patient and healthcare professional perspectives

Dominic Chu[1,2], David Lessard[2,3,4], Moustafa Ahmed Laymouna[1,2], Kim Engler[2,3,4], Tibor Schuster[1], Yuanchao Ma[2,3,4,5], Nadine Kronfli[3,4], Jean-Pierre Routy[4], Tarek Hijal[6], Karine Lacombe[7], Nancy Sheehan[4,8], Hayette Rougier[9], Bertrand Lebouché[1,2,3,4]

[1]Department of Family Medicine, McGill University, Montreal, Canada, [2]Canadian Institutes of Health Research Strategy for Patient-Oriented Research Mentorship Chair in Innovative Clinical Trials in HIV, Montreal, Canada, [3]Centre for Outcomes Research and Evaluation, Research Institute of the McGill University Health Centre, Montreal, Canada, [4]Department of Medicine, Division of Infectious Diseases and Chronic and Viral Illness Service, McGill University Health Centre, Montreal, Canada, [5]Department of Mechanical Engineering, Polytechnique Montréal, Montreal, Canada, [6]Division of Radiation Oncology, McGill University Health Centre, Montreal, Canada, [7]Sorbonne université, Inserm IPLESP, Hôpital St Antoine, APHP, Paris, France, [8]Faculté de pharmacie, Université de Montréal, Montréal, Canada, [9]IMEA, Institut de Médecine et d'Épidémiologie Appliquée, Paris, France

Purpose: Patient portals can engage people with HIV (PWHIV) by allowing patients to access their medical record online as well as other services. This study aims to understand the perspectives of both PWHIV and specialized healthcare providers (HCPs) regarding benefits and risks of using a patient portal within HIV care in Canada and France.

Methods: Between August 2019 and March 2020, we held focus group discussions with PWHIV and healthcare providers, separately, in the HIV-specialized clinics of the McGill University Health Centre, Montreal, Canada, and of Saint-Antoine Hospital, Paris, France. PLWH were recruited by maximum variation sampling, while HCPs were recruited with purposeful sampling. Semi-structured interview schedules were used. Each focus group was recorded, and transcriptions were coded using NVivo 12 software and analyzed by content analysis.

Results: Participants include 28 PWHIV in four focus groups and 31 HCPs in six focus groups. PWHIV included 18 men, 9 women, and 1 person identifying as other; while, HCPs included 10 men, 20 women, and 1 person identifying as other. A multi-disciplinary team of HCPs included physicians, nurses, pharmacists, social workers, and clinical coordinators. Our analysis identified four key benefits of using a patient portal: 1) improves self-management, 2) facilitates patient visits, 3) accounts for patient preferences, and 4) meets unforeseen or evolving patient needs. Five possible risks were identified: 1) breach of confidentiality, 2) stress or uncertainty, 3) contribution to the digital divide, 4) dehumanized care, and 5) increased HCP workload.

Conclusions: Consulting with PWHIV and HCPs revealed that both groups agreed upon various benefits and risks associated with using a patient portal. The implementation of a patient portal in HIV clinical care should be informed by end-users' input to optimize the benefits and mitigate potential risks to secure adoption, thus favoring patient health, wellbeing, and engagement in care.

190 Impact of COVID-19 on Sexually Transmitted Infections and Nurse-led HIV Pre-Exposure Prophylaxis (PrEP) Initiation and Retention at Cool Aid Community Health Centre for Men Who Have Sex with Men (MSM)

Marion Selfridge[1,2], Karen Lundgren[1], Tamara Barnett[1], Kellie Guarasci[1], Hannah Roy[1], Chris Fraser[1,3]
[1]Cool Aid Community Health Centre, Victoria, Canada, [2]University of Victoria, Victoria, Canada, [3]Department of Family Practice, University of British Columbia, Vancouver, Canada

Background: Gay, bisexual and MSM continue to comprise the greatest number of new HIV diagnosis in BC (BCCDC, 2019). STI screening and treatment has provided opportunities to explore HIV risk with MSM and assess if BC publicly funded PrEP is an appropriate intervention strategy. COVID-19 has had major sexual health implications for all Canadians, including target groups for PrEP.

Description of model of intervention: This novel Community Health Centre based Men's STI Testing Clinic is staffed by STI certified practice nurses and run in partnership with AIDS Vancouver Island. Our nurse-led model enrolled 124 gbMSM in 2018, the initial year of the BC PrEP program. There have been no HIV infections amongst PrEP recipients. COVID restrictions meant a closure of Men's Testing Night and limited access to in-person testing, with longer (120 vs 90 day) prescriptions for PrEP.

Impacts of COVID: From January 2019 until COVID lockdown March 2020, an average of 35.3 monthly STI screenings were completed with 3.3 positive rectal chlamydia/gonorrhea and syphilis results per month. In the same time frame 5.1 clients were started on PrEP per month. In the first six months of COVID restrictions, average monthly STI tests fell to 18, with 1.8 monthly positive rectal chlamydia/gonorrhea and syphilis tests and 3.3 PrEP starts. In total, just 52 (28.7%) of those who started on PrEP in 2018-19 have continued on PrEP.

Conclusion: While there has been an increase in connection to STI testing and PrEP as COVID restrictions have lifted, the rate of positive STI's continues to impact the sexual health of this population.

196 Exploring the association between annual income of never- and former PrEP-using gay, bisexual, and other men who have sex with men and their willingness to use injectable PrEP

Ashan Wijesinghe[1,2], Oscar Javier Pico-Espinosa[2], Mark Hull[3], Paul MacPherson[4], Daniel Grace[1], Mark Gaspar[1], Kevin Woodward[5], Nathan Lachowsky[6], Saira Mohammed[3], Karla Fisher[7], Simon Rayek[8], Camille Arkell[9], Tyllin Cordeiro[10], Garfield Durrant[11], Warren Greene[12], David Hall[13], Matthew Harding[14], Jody Jollimore[15], Marshall Kilduff[16], John Maxwell[17], Leo Mitterni[18], Eric Peters[19], Robinson Truong[1,2], Darrell H. S. Tan[1,2]

[1]University of Toronto, Toronto, Canada, [2]St. Michael's Hospital, Toronto, Canada, [3]BC Centre for Excellence in HIV/AIDS, Vancouver, Canada, [4]University of Ottawa, Ottawa, Canada, [5]McMaster University, Hamilton, Canada, [6]University of Victoria, Victoria, Canada, [7]Toronto General Hospital, Toronto, Canada, [8]Health Initiative for Men, Vancouver, Canada, [9]Canadian AIDS Treatment Information Exchange (CATIE), Toronto, Canada, [10]Alliance for South Asian AIDS Prevention (ASAAp, Toronto, Canada, [11]Black Coalition for AIDS Prevention (Black CAP), Toronto, Canada, [12]Canadian Aboriginal AIDS Network, Fort Qu' Appelle, Canada, [13]Vancouver Coastal Health, Vancouver, Canada, [14]MAX Ottawa, Ottawa, Canada, [15]Community-Based Research Centre, Vancouver, Canada, [16]AVI Health and Community Services, Victoria, Canada, [17]AIDS Committee of Toronto, Toronto, Canada, [18]Hassle Free Clinic, Toronto, Canada, [19]The Gay Men's Sexual Health Alliance, Toronto, Canada

Background: Long-acting injectable cabotegravir as HIV pre-exposure prophylaxis (PrEP) could address challenges with oral PrEP acceptability and adherence. With the approval of this drug anticipated soon, we assessed how its acceptability might be associated with income given that injectables are often costlier than pills.

Methods: We analyzed data from the PrEP Implementation Project (PRIMP) surveying gay, bisexual, and other men who have sex with men (GBM) in Ontario and British Columbia between July 2019 and Aug 2020. Survey respondents were HIV-negative never/former PrEP-users meeting Canadian PrEP guideline criteria (with a HIRI-MSM cut-off >25 to increase specificity for higher HIV-risk). We measured the association between participants' personal income and willingness to use injectable PrEP in a logistic regression model adjusted for age, previous PrEP use, post-secondary education, and ethno-racial identity.

Results: Of the 238 individuals included, 185 (78%) were from Ontario, mean age was 31 years (SD=8.3), 64% were white, 89% had completed post-secondary education, and 47% were former PrEP-users. Overall, 72% were willing to use injectable PrEP. There was a negative association between willingness and annual income (Table 1). Fewer never PrEP-users appeared willing to use injectables (66% vs 77% former PrEP-users, χ=3.2, p=0.07). The other variables adjusted for did not present any significant associations.

Conclusions: There was a negative association between income of never/former PrEP-using GBM and willingness to use injectable PrEP, with higher willingness in lower income groups. Understanding which individuals are most willing to use injectables may help tailor PrEP delivery in the future.

Supporting Document

Table 1: Willingness to use injectable PrEP by income brackets						
Income	**Willingness to use Injectable PrEP (Y/N)**		**OR (95% CI)**	**p-value**	**aOR (95% CI)***	**p-value**
	Y (n=163)	N(n=63)				
Less than $40,000pa	57 (81%)	13 (19%)	ref	-	ref	-
$40,001pa - $60,000pa	67 (66%)	34 (34%)	0.45 (0.21 -0.92)	0.03	0.35 (0.15 -0.75)	0.01
More than $60,000pa	39 (71%)	16 (29%)	0.56 (0.24 -1.28)	0.17	0.41 (0.16 -1.02)	0.06

*Adjusted for previous PrEP use, age, education, and race.

209 Physical and Sexual Abuse Among Gay and Other Men Who Have Sex with Men. HIV Risk Factors We Fail to Speak of

M.D. Claudia MacIsaac[1], Paul MacPherson[1], Sahar Razmjou[1]
[1]*The Ottawa Hospital Research Institute, Ottawa, Canada*

Several studies have demonstrated a clear link between childhood sexual abuse and HIV risk among gay, bisexual and other men who have sex with men (GBMSM). Much less is known, however, about other forms of abuse including adult sexual abuse and family/intimate partner physical violence. To explore this, data were collected from an anonymous online survey of GBMSM in Ontario conducted from June 2018 to March 2019.

Of 1755 respondents, the mean age was 38.1 years (SD = 15.2), the vast majority (83%) were white and just over half (58%) lived in an urban setting. One in six (16.3%) reported a history of childhood sexual abuse and one in five (19.4%) reported being forced as an adult to have sex against their will. Just over a third (35%) indicated a history of physical abuse by a partner or family member. Among those who were physically abused, 31.7% were also sexually abused as an adult. Being out to everyone or most people was associated with an increased risk of both adult sexual and physical abuse suggesting GBMSM who are out may become targets for abuse.

Further, men who were HIV+ were more likely to suffer physical violence and nearly twice as likely to be forced to have sex. In terms of HIV risk factors, sexual anxiety and substance use including recreational drug use during sex were all positively associated with a history of sexual and/or physical abuse while condom use declined with all three forms of abuse.

These data indicate an alarming prevalence of abuse among GBMSM and, while we cannot distinguish cause from effect, sexual abuse and family/intimate partner violence are associated with substance use and increased sexual risk. We strongly advocate for greater awareness and more discussion of these challenges along with more research on safe disclosure and support.

225 Documenting the Change in Hemoglobin A1C after initiating Integrase Strand Transfer Inhibitors in Diabetic and Non- Diabetic HIV Patients compared to other antiretroviral drugs

Genevieve Olsen[1]
[1]*Alberta Health Services, Calgary, Canada*

INTRODUCTION: With the introduction of integrase strand transfer inhibitors (INSTI) based combined antiretroviral therapy (cART), persons with HIV (PWH) have a well-tolerated and potent new treatment option. Metabolic effects including hyperglycemia have been reported with INSTI based cART. In this study we analyzed the magnitude of the change in hemoglobin A1C (HbA1C) seen in diabetic and non-diabetic patients who start INSTI based cART and how this change compares to other HIV classes.

METHODS: We conducted a retrospective cohort study of PWH at the Southern Alberta Clinic who started on cART, including INSTI, protease inhibitor (PI), non-nucleoside reverse transcriptase inhibitors (NNRTI), >90 days between 2010-2019. We assessed the change in HbA1C pre-cART start and post-cART start. Diabetic and non-diabetic PWH were stratified by cART class and then further stratified by INSTI medication. In a sub-group analysis, we compared diabetic PWH with a starting HbA1C of <8.5 versus HbA1C of ≥ 8.5.

RESULTS: A total of 1114 PWH were included (937 non-diabetic／177 diabetic, 73% male／27% female). Non-diabetic PWH had an average change in % HbA1C of 0.02 (SD 0.37) with INSTI start (n=769) versus 0.03 (SD 0.26) with NNRTI start (n=115) p=.881. Diabetic PWH had an average change in % HbA1C of 0.57 (SD 1.24, average days between HbA1C tests= 230) with INSTI start (n=105) versus 0.35 (SD 0.75, average days between HbA1C test =280) with NNRTI start (n=19) p=.461.

CONCLUSION: In our non-diabetic PWH population there was no significant change in HbA1C in patients started on INSTI vs NNRTI. In our diabetic patient population, the HbA1C increases was larger after INSTI start versus NNRTI start but not statistically significant. There were many confounding factors which were not accounted for and additional studies on the effect of integrase inhibitors on HbA1C are recommended.

230 External Quality Assessment for Point-of-Care HIV Diagnosis: Lessons Learned from Africa

Dana Cabiles[1], Micah Venus[1], Linda Ares[1], Leanne Pukalo[1], Tomasz Bielawny[1], Margot Plews[1], Adrienne Meyers[1,2], Paul Sandstrom[1,2], Tracy Taylor[1]
[1]Public Health Agency of Canada, Winnipeg, Canada, [2]Department of Medical Microbiology and Infectious Diseases, University of Manitoba, Winnipeg, Canada

Background: In countries burdened with a high incidence of pediatric HIV there is a notable disparity in the treatment cascade for infants. In response, networks of point-of-care (POC) devices for early-infant diagnosis (EID) were established at the community level throughout certain African countries. These devices increase accessibility to diagnostic testing and linkage-to-care for HIV-exposed/diagnosed infants. To date, QASI-EID is the only international external quality assessment (EQA) program offering proficiency testing (PT) specifically for EID on POC devices.

Objective: After the successful administration of 6 QASI-EID PT sessions to participants at 331 POC sites in 8 African countries, we sought to review the accomplishments, challenges and lessons learned.

Methods: QASI-EID operates through in-country Coordinators who are responsible for distribution of panels and submission of results. Bi-annually, POC sites receive a 3-sample panel (2 positive, one negative). In each PT session, a thorough analysis of participant results, non-conformances and circumstances that prevent POC sites from participating is compiled. Responses from over 900 submissions over 6 PT sessions were evaluated and the main issues affecting EID at POC sites were identified.

Results: On average, result return rate is 70%. Of those, over 94% are proficient for the EID test. Of the 30% who were not able to participate the primary reasons cited are lack of communication, cartridge stock-out, instrument malfunction, and absence of trained personnel.

Conclusion: POC technology has contributed to a reduction in HIV-related infant mortality in Africa. This same technology is applied for adult diagnostics and viral load monitoring at the community level, thereby empowering communities, domestically and internationally, to combat the HIV crisis locally. EQA is important to provide oversight, training and support through corrective action to ensure accurate reliable results from POC sites and facilitate long-term success and sustainability of POC networks for HIV patient care and management.

231 External Quality Assessment for Point-of-Care HIV Viral Load Testing: Development and Results of a Pilot Proficiency Testing Panel

Dana Cabiles[1], Micah Venus[1], Linda Ares[1], Leanne Pukalo[1], Tomasz Bielawny[1], Margot Plews[1], Adrienne Meyers[1,2], Paul Sandstrom[1,2], Tracy Taylor[1]
[1]Public Health Agency of Canada, Winnipeg, Canada, [2]Department of Medical Microbiology and Infectious Diseases, University of Manitoba, Winnipeg, Canada

Background: The GeneXpert® assay for HIV viral load (VL) has increased in use at point-of-care (POC) testing sites internationally, resulting in demand for external quality assessment (EQA). QASI®, the international program for Quality Assessment and Standardization of Indicators relevant to HIV/AIDS recently expanded its services to include EQA specifically for this test.

Objective: 1) Develop a VL proficiency testing (PT) material that simulates clinical samples (non-infectious), is stable over time under various conditions, and is compatible with development of EQA programs in resource-limited settings. 2) Pilot a 3-specimen PT panel for POC instruments with collaborating countries in Africa and South America.

Methods: A new PT material consisting of Tris-EDTA buffer spiked with heat inactivated HIV cell culture supernatant was evaluated with the GeneXpert VL assay. The stability of the new material was compared to existing VL PT material (dried tube specimens, DTS) at different temperatures. VL stability of the new PT material was further evaluated over time and under heat-stress. Panels consisting of two positive and one negative sample were distributed to 81 POC sites in 7 countries. Results were submitted to a secure QASI-VL website for group analysis.

Results: The new PT material performed better than DTS at higher temperatures and maintained a stable VL over time and under heat-stress. In the QASI-VL Pilot session, 63% of participating POC sites reported results for the pilot panel, with 82% correctly reporting results for all three samples.

Conclusion: A fit-for-purpose PT material which more accurately simulates a typical clinical sample, was successfully developed and utilized by participants in the QASI-VL pilot. This is the first HIV VL PT panel developed specifically for POC instruments. VL testing is critical for patient management, and POC technology offers an innovative approach to empower communities (domestically and internationally) with a unique alternative for monitoring HIV.

234 Impact of the COVID pandemic on HIV care continuum for a vulnerable population of people living with HIV who use drugs in London Ontario

Megan Devlin[1,2], Joanna Tulloch[3], Derek Straatsma[2], Kelly Muhsin[2], Michael McGregor[3], Lise Bondy[1,2], Michael Silverman[1,2]
[1]Division of Infectious Diseases, Western University, London, Canada, [2]St. Joseph's Health Centre, London, Canada, [3]London Intercommunity Health Centre, London, Canada

Background: The COVID-19 pandemic has resulted in disrupted health services in many sectors. In a mid-sized Ontario city, a multidisciplinary care team serves a population of people living with HIV also affected by intersections of substance use and housing instability. Our aim was to assess the impact of the COVID pandemic on HIV care for this vulnerable patient population.

Methods: We performed an audit of this study population's HIV and general medical care in the 12 months before and after the start of the COVID pandemic (using Mar. 2020 as the beginning of the pandemic period).

Results: In this population (n=37), the median age was 44 and 45.6% female. With regards to substance use, at baseline, 90.9% reported opioid use, 87.8% methamphetamine use. In the pre-pandemic 12-month period, the mean number of HIV care visits per person was 2.76 ±0.303 (95% CI), but fell to 2.17±0.231 in the 12 months after March 2020 (p=0.001). Pre-pandemic, 3.9% of visits were conducted virtually, compared with 26% after March 2020. 51.3% of the population maintained a consistently undetectable viral load pre-pandemic vs 56.7% after March 2020. Mean number of ED visits (3.62 ±1.66 (95% CI) vs 3.11 ±1.626, p=0.33) and admissions to hospital (0.89 ±0.429 vs 0.67 ± 0.452, p= 0.25), did not fall significantly, although our small sample size may have limited the ability to detect a fall. 2 deaths were recorded in the pre-pandemic year compared with 0 in the pandemic period.

Conclusions: This patient population continued to receive HIV care throughout the pandemic that was tailored to their needs (eg phone visits when in person care was disrupted). There was a small statistically significant reduction in HIV clinical visits. In spite of this, a majority of patients were able to maintain an undetectable viral load.

243 Identifying candidate instruments for measuring HIV-related anxiety in HIV PrEP users

Stephen Cho[1,2], Trevor A. Hart[3,4], Paul Shuper[4,5], Darrell H.S. Tan[1,2,6,7]
[1]Institute of Medical Science, University of Toronto, Toronto, Canada, [2]MAP Centre for Urban Health Solutions, St. Michael's Hospital, Toronto, Canada, [3]Department of Psychology, Ryerson University, Toronto, Canada, [4]Dalla Lana School of Public Health, University of Toronto, Toronto, Canada, [5]Institute for Mental Health Policy Research and Campbell Family Mental Health Research Institute, Centre for Addiction and Mental Health, Toronto, Canada, [6]Division of Infectious Diseases, St. Michael's Hospital, Toronto, Canada, [7]Department of Medicine, University of Toronto, Toronto, Canada

Background: HIV pre-exposure prophylaxis (PrEP) may alleviate HIV-related anxiety, defined as “significant concern about being at risk of, testing for, and/or being diagnosed with HIV”. However, the optimal tools for measuring this construct are unclear. We sought to identify candidate psychometric scales for measuring HIV-related anxiety in a prospective cohort study of PrEP users.

Methods: We searched electronic databases (APA PsycTests, Health and Psychosocial Instruments, and Mental Measurements Yearbook) from 1995-2021 to identify psychometric scales and/or questionnaires that measure HIV-related anxiety. Scales were assessed based on conceptual fit (extent to which the scale matches the variable we aim to measure), validity (construct/criterion), reliability (test-retest/Cronbach’s alpha), and feasibility (number of items/rating system).

Results: Five candidate instruments were identified and evaluated; two psychometric scales and three questionnaires (Table 1). Only Keen and Holt appeared to measure specifically HIV-related anxiety. Snell discussed the construct of sexual anxiety as opposed to anxiety regarding HIV, Yi examined fatalistic beliefs about maintaining HIV-negative serostatus, and Van de Ven measured skepticism/optimism regarding novel HIV treatments. No instrument evaluated criterion validity while three instruments assessed construct validity (Snell, Yi, and Van de Ven). Most instruments had appropriate Cronbach’s alphas (>0.70); no instrument tested test-retest reliability. All instruments appeared feasible based on appropriate number of items and rating methods.

Conclusions: A limited number of tools exist to quantitatively measure HIV-related anxiety. While further evaluation of their measurement properties may be beneficial, instruments developed by Keen and Holt are potentially well-suited for evaluating PrEP-related changes in HIV-related anxiety.

Supporting Document

Table 1. Evaluation of instruments associated with HIV-related anxiety.

Instrument	Multidimensional Sexual Self-Concept Questionnaire – Sexual Anxiety Subscale	HIV Anxiety Items	HIV Concern Scales	Disengagement Coping with HIV Risk Scale	Optimism-Scepticism Scale
Instrument Type	Questionnaire	Questionnaire	Questionnaire	Psychometric Scale	Psychometric Scale
Author (Year)	Snell, W. (1998)	Keen et al. (2020)	Holt et al. (2019)	Yi et al. (2010)	Van de Ven et al. (2000)
Sample in Whom Evaluated	U.S. university students (n=473)	Australian gay and bisexual men (n=1,547)	Australian gay and bisexual men (n=4,567)	U.S. HIV-negative gay men (n=285)	Australian gay men (n=532)
Conceptual Fit	X	ü	ü	X	X
Construct Validity	ü	X	X	ü	ü
Criterion Validity	X	X	X	X	X
Test-Retest Reliability	X	X	X	X	X
Cronbach's Alpha	0.84	0.82	0.78	0.67	0.79
Number of Items	5	3	4	12	12
Rating Scale	5-point Likert scale	6-point Likert scale	5-point Likert scale	Unspecified	4-point Likert scale

244 The Prevalence of Chronic/Latent Viral Infections in a Cohort of People Living with HIV in Canada

Yi Yang[1,2], Anthony YY Hsieh[1,2], Amber R Campbell[3,4], Melanie CM Murray[3,4,5], Hélène CF Côté[1,2,3]

[1]Department of Pathology and Laboratory Medicine, University of British Columbia, Vancouver, Canada, [2]Centre for Blood Research, University of British Columbia, Vancouver, Canada, [3]Women's Health Research Institute, British Columbia Women's Hospital and Health Centre, Vancouver, Canada, [4]Oak Tree Clinic, BC Women's Hospital and Health Centre, Vancouver, Canada, [5]Division of Infectious Diseases, The University of British Columbia Faculty of Medicine, Vancouver, Canada

Background: People living with HIV (PLWH) experience faster cellular and immunological aging relative to their HIV-negative peers. This may be influenced by co-infection with other chronic/latent viruses such as CMV, EBV, HHV-8, HSV-1, HSV-2, HCV, and HBV. Several of these viruses are individually known to be associated with markers of aging or age-associated diseases. Our aim was to characterize the number and type of chronic/latent viral infections in a cohort of people living with or without HIV, and determine any association with HIV status.

Methods: HIV-positive (n=103) and HIV-negative (n=101) female CARMA cohort participants were selected for this analysis, with n~15 per decade of age [0-60+]. Infection status for CMV, EBV, HHV-8, HSV-1, and HSV-2 was determined serologically; HIV, HCV, and HBV were self-reported. Associations between total number of viruses, HIV status, and age were assessed using Mann-Whitney, Spearman's correlation, and ordinal logistic regression modelling.

Results: Among HIV-positive and HIV-negative participants, having a greater number of viruses was univariately associated with older age (rho=0.38, p<0.0001), and with HIV-positive status (p=0.0014) (see Table 1). After adjusting for age and ethnicity, HIV-positive status remained independently associated with having a greater number of chronic/latent viral infections (β=0.34, p=0.01).

Discussion: These data suggest that female individuals living with HIV experience a higher prevalence of chronic/latent viral infections that could exert a heavier burden on their immune system. Determining whether this is associated with immune aging and/or co-morbidities could give insight into the value of treating and/or preventing other viral infections to improve health outcomes.

Supporting Document

Table 1. Total number of viral infections and specific virus prevalence amongst HIV- and HIV+ groups	HIV+ (n=103)	HIV- (n=101)	Δ HIV+ vs. HIV- (%)
Total number of viruses			
Participants with 0 or 1 viruses	14 (13.6)	26 (25.7)	-12.1
Participants with 2 or 3 viruses	50 (48.5)	50 (49.5)	-1.0
Participants with 4 or more viruses	39 (37.9)	25 (24.8)	+13.2
Virus type			
Cytomegalovirus (CMV)	65 (63.1)	42 (41.6)	+21.5
Epstein-Barr virus (EBV)	99 (96.1)	88 (87.1)	+9.0
Human herpes virus 8 (HHV-8)	18 (17.5)	27 (26.7)	-9.2
Herpes simplex virus type 1 (HSV-1)	60 (58.3)	52 (51.5)	+6.8
Herpes simplex virus type 2 (HSV-2)	53 (51.4)	31 (30.7)	+20.7
Hepatitis C virus (HCV)	17 (16.5)	7 (6.9)	+9.6
Hepatitis B virus (HBV)	7 (6.8)	1 (1.0)	+5.8
Data shown as number of participants infected and percent infected (%) unless otherwise stated			

246 Frequency of Bacterial Sexually Transmitted Infections (STIs) Testing Among HIV Pre-Exposure Prophylaxis (PrEP) Users in Ontario

Lauren Tailor[1], John Matelski[2], Nila Parvaresh[3], Ryan Lisk[4], Trevor Hart[1,5], Sharmistha Mishra[6], Mia Bondi[7], Paul MacPherson[8], David Knox[9], Kevin Woodward[10], John MacLeod[11], Isaac Bogoch[1,2], Deanna Clatworthy[12], Alan Li[13], Fanta Ongoiba[14], Darrell Tan[1,3,6,15]
[1]University Of Toronto, Toronto, Canada, [2]University Health Network, Toronto, Canada, [3]MAP Centre for Urban Health Solutions, Toronto, Canada, [4]AIDS Committee of Toronto, Toronto, Canada, [5]Ryerson University, Toronto, Canada, [6]St. Michael's Hospital, Toronto, Canada, [7]Western University, London, Canada, [8]The Ottawa Hospital , Ottawa, Canada, [9]Maple Leaf Medical Clinic, Toronto, Canada, [10]Hamilton PrEP Clinic, Hamilton, Canada, [11]790 Bay St Clinic, Toronto, Canada, [12]ARCH Clinic, Guelph, Canada, [13]Ontario HIV Treatment Network, Toronto, Canada, [14]Africans in Partnership Against AIDS, Toronto, Canada, [15]Toronto General Hospital, Toronto, Canada

Introduction: Canadian guidelines on HIV PrEP recommend quarterly STI screening. We used data from the Ontario PrEP Cohort Study (ON-PrEP) to quantify the frequency of syphilis, gonorrhea, and chlamydia screening among PrEP users.

Methods: Adults using PrEP enrolled into ON-PrEP from 10 sites in 6 Ontarian cities since 01FEB2018. Site staff entered STI data into a database every 6-months for up to 24-months. We obtained STI test data from the Public Health Ontario Laboratory (PHOL) via health card linkage. We quantified STI testing and diagnoses with study database and PHOL data collected between participants' enrollment date and 27FEB2021. We used generalized estimating equations to determine testing rates, infection rates, and test positivity per STI for each data source among those with at least 1 test, accounting for repeated measures. Simultaneous testing of multiple anatomic sites were counted as one test.

Results: Of 630 participants, 362-491(57.5-77.9%) participants had non-zero testing and were included in analyses. Testing rates ranged from 1.49-3.18/year while infection rates ranged from 2.75-11.11/100 person-years, varying by data source (Table).

Conclusion: STI testing and infection rates among PrEP users in Ontario are variable. Limitations include the potential for decreased testing due to the COVID-19 pandemic and lack of information on out-of-province testing. Nonetheless, reminders to integrate regular STI screening into PrEP follow-up visits are critical and future integration of data sources may improve our understanding of STI epidemiology among PrEP users.

Supporting Documents

Table: STI Testing, Infection, and Positivity Rates[a]

	Testing Rate (per year)[b]	Infection Rate (per 100 person-years)[b]	Test positivity (%)
Syphilis			
Study Database(n=481)	1.49 (1.14, 1.94)	4.88 (3.22, 7.40)	3.19
PHOL(n=463)	3.18 (2.43, 4.14)	2.75 (1.83, 4.12)	1.87
Combined (n= 547)	3.74 (2.63, 5.33)	3.66 (2.31, 5.79)	2.87
Gonorrhea			
Study Database(n=489)	1.63 (1.42, 1.88)	8.22 (6.47, 10.44)	4.19
PHOL(n=362)	1.99 (1.58, 2.52)	10.28 (7.87, 13.41)	5.33
Combined (n= 524)	2.01 (1.68, 2.41)	11.35 (9.16, 14.07)	5.36
Chlamydia			
Study Database(n=491)	2.01 (1.76, 2.30)	6.26 (4.76, 8.22)	3.92
PHOL(n=374)	1.87 (1.57, 2.23)	11.11 (8.57, 14.39)	5.16
Combined (n= 528)	2.13 (1.80, 2.51)	9.98 (7.85, 12.68)	5.07

[a]Adjusted for age at baseline, sex at birth, and mean drug use in the last 6 months
[b]Estimate (95% confidence interval

250 Sharpening Our Tools: Developing Next-Generation Humanized Mouse Models for HIV and TB Research

Jack (Xiaozhi) Yang[1], Madeleine Lepard[1], Sam Afkhami[1], Anna Zganiacz[1], Aisha Nazli[1], Fatemah Vahedi[1], Alexandre Deshiere[2], Michel Tremblay[2], Ali Ashkar[1], Zhou Xing[1], Charu Kaushic[1], Amy Gillgrass[1]
[1]McMaster University, Hamilton, Canada, [2]Laval University, Quebec City, Canada

Despite development of effective antiretroviral therapy, HIV still remains uncurable and was responsible for over 680,000 global deaths in 2020. Furthermore, persons living with HIV (PLWH) are at much greater risk of developing active tuberculosis (TB) infection, which is the biggest killer of PLWH. HIV and TB are urgent global issues and further research is required for prevention, therapeutics, and cure.

Humanized mice such as the humanized NOD-RAG-/--Gamma-/- (hu-NRG) model repopulate with human immune cell populations essential for HIV and TB investigation. Our lab has established a next-generation model of hu-NRG mice expressing HLA class I and II (hu-DRAG-A2) engrafted with HLA-matched stem cells that repopulate with higher levels of human cells such as CD4+ T cells, macrophages, and mature B cells.

To further evaluate the functionality of hu-NRG and hu-DRAG-A2 mice, we infected both models intravaginally with HIV-1 and followed their disease course until 8 weeks post-infection. Both models established high plasma viral load beginning 2 weeks post-infection until endpoint when human CD4+ T cell depletion was also observed. Immunohistochemistry displayed reduced human CD4+ T cell and CD68+ macrophages within infected vaginal and lung tissue compared to uninfected tissue. Only the infected hu-DRAG-A2 mice produced detectable levels of HIV-specific IgG antibodies in endpoint plasma, displaying their increased immune functionality. Hu-NRG and hu-DRAG-A2 mice were also infected intranasally with Mtb and followed until 4 weeks post-infection.

Both models established high bacterial load within the lung and spleen demonstrating successful lung infection and extra-pulmonary bacterial dissemination. Furthermore, lung histology showed hu-DRAG-A2 mice develop granulomas with a Mtb-containing necrotic core surrounded by a CD4+ T cell halo that is characteristic of human-like pathology.

We are currently conducting HIV/TB co-infection studies as these results indicate hu-DRAG-A2 mice are promising tools for vaccination and therapeutics studies for both HIV infection and HIV/TB co-infection.

252 Outcomes of an Anal Pap Screening Program During the COVID Pandemic

Kelly Muhsin[1], Megan Devlin[1,2], Sameer Elsayed[1,2], Michele Ellis[1], Sarah Shalhoub[1,2], Michael Silverman[1,2], Lise Bondy[1,2]
[1]St. Joseph's Health Care London, London, Canada, [2]Western University , London , Canada

Background: Annual anal pap smears have been recommended in some guidelines for MSM living with HIV. The practicality of this strategy, especially during the pandemic, is unknown.

Methods: We performed a chart review of all MSM living with HIV who received at least one anal pap smear at the HIV clinic in London, Ontario between January 2018–October 2021. During the pandemic period a large proportion of physician visits were virtual, however patients who were eligible were booked for in person visits with a nurse for anal pap screening. Patients with LSIL or higher-grade lesions were referred to colorectal surgery.

Results: 301 anal pap smears were done in 200 unique patients. 17/200(8.5%) patients had at least one anal pap showing LSIL or higher-grade lesion, of which 13/17 were detected on the first anal pap. Of 32 patients who had a baseline normal anal PAP which was repeated within 9-15 months, 2(6%) progressed to LSIL or a higher-grade lesion within that time. 12/17(70%) patients attended a colorectal surgery appointment for anoscopy, and 7 of these patients required surgery. 5 patients declined referral. 3 patients had their surgery delayed more than 6 months due to COVID shutdowns. 96/386(25%) of eligible patients had anal paps done in the 18 months prior to the pandemic (Oct 1,2018-March1,2020) and 154/386(40%) patients were tested in the subsequent 18 months. No patients developed new metastatic anal cancer during this period.

Conclusions: Anal pap smears were able to be performed within the HIV clinic setting even during the COVID-19 pandemic. The rate of patient screening actually rose during this time with many patients attending with the nurse specifically to have the anal pap, but further efforts to increase the percentage of patients screened are warranted. Some patients experienced marked delays in surgery due to the pandemic.

255 Hepatitis C Treatment in Provincial Jails: A Missed Opportunity

Lise Bondy[1,2], Kelly Muhsin[1], Michael Silverman[1,2]
[1]St. Joseph's Health Care London, London, Canada, [2]Western University , London , Canada

Background: In Ontario and Manitoba, Hepatitis C therapy is not funded for inmates in the provincial correctional system. The efficacy of seeing patients while incarcerated in order to link them to subsequent outpatient care is unknown.

Methods: Two Infectious Diseases physicians and one Hepatitis C Nurse conducted consultations in a provincial jail in London, Ontario. Charts were reviewed for outcomes.

Results: 209 mono-infected Hepatitis C patients were assessed between January 2017-October 2021. 11 were treated while incarcerated via obtaining coverage as a purported outpatient, prior to this option being closed in March of 2020. One patient with decompensated cirrhosis was released briefly to allow outpatient treatment before being re-incarcerated. One patient followed up for outpatient treatment and obtained sustained virologic response (SVR). In total, SVR was obtained in 6 out of 209 (2.9%) inmates assessed. Since the closure of the option to obtain outpatient HCV treatment coverage from the provincial plan while incarcerated, no further treatment has occurred.

Conclusion: Consultations while incarcerated does not lead to linkage to care post release, even when contact information to the clinic including a picture and map of the location was provided. The policy of not covering Hepatitis C medications while incarcerated in a provincial institution needs to be reconsidered.

258 Supporting Rural and Remote Areas: A clinic-led outreach HIV care model and its associated HIV cascade of care outcomes, Saskatchewan, Canada, 2018-2020.

Stephanie Konrad[1,2], Mamata Pandey[3], Maria Folk[2], Cara Spence[4], Marina Klein[5], Yuping Zhan[4], Dharma Teja Yalamanchili[2], Britin Mason[2], **Stuart Skinner**[2,4]
[1]Indigenous Services Canada, Regina, Canada, [2]Wellness Wheel, Regina, Canada, [3]Saskatchewan Health Authority, Regina, Canada, [4]University of Saskatchewan, Saskatoon, Canada, [5]McGill Unversity, Montreal, Canada

Introduction: Saskatchewan has had the highest incidence of HIV nationally for over a decade. Beginning in urban centres, HIV spread to rural and remote areas in Saskatchewan, leading to the emergence of unique rural care models to address gaps in HIV care services. We describe a clinic-led outreach model where urban physicians, nurse practitioners and nurses travel ~200-250km from their home base to conduct monthly satellite clinics at regional local hospitals.

Methods: Existing documentation and key stakeholders engagement were used to describe the care model. Data was extracted for clients accessing care between 01/01/2018-12/31/2020 from an electronic medical record system. Demographics and clinical outcomes were described, including the proportion of active clients on treatment and virally suppressed (defined as at least one ART prescription in the calendar year and the last viral load within the calendar year <200 copies/mL, respectively).

Results: The care model, initiated in 2016, relies on local services including opioid substitution therapy and pharmacy. Phlebotomy services were introduced in 2020 by the outreach team due to limited local services. In-person clinics were temporarily suspended due to the COVID-19 pandemic and replaced by virtual care. Out of 48 HIV clients in care between 2018-2020, 70% of clients were HCV co-infected, 54% were males and the average age was 45 years (SE±2.07). 69% of clients resided in nearby First Nation communities. In 2018, 51% of clients were on treatment, of whom 55% were virally suppressed. These outcomes increased in 2019 and by 2020: 76% of clients were on treatment, of whom 66% were virally suppressed.

Conclusions: Despite the disruptions of COVID-19, this remote clinic outreach model achieved improvements in the cascade outcomes. The improvements reflect progress in establishing relationships, building trust with clients and the utility of virtual care to maintain patient care during a pandemic.

262 Viral Blip post-ChAdOx1 nCoV-19 (AZD1222) Vaccine In A Patient With Controlled HIV

Sharan Lail[1], Vanna Schiralli[1,2]
[1]St. Michael's Hospital, Unity Health, Toronto, Canada, [2]Faculty of Medicine, University of Toronto, Toronto, Canada

Persons living with HIV (PLWH) are disproportionately affected by COVID-19. Fortunately, vaccines improve COVID-19 immunity amidst tolerable adverse events.

ChAdOx1 nCoV-19 and BNT162b2 mRNA COVID-19 are two COVID-19 vaccines found to induce similar immune responses in both PLWH and non-HIV patients; however, post-vaccination viral loads were never quantified in the former, and interestingly increased in the latter from undetectable to 47, 52, and 92 copies/mL, in three patients over two weeks post-2nd BNT162b2 vaccination. Such viremia ('viral blips') are known to occur with PLWH and influenza vaccines. The current case study describes this viremia eight weeks post-ChAdOx1, but not post-BNT162b2, vaccination.

The patient is a 65-70 year-old male in Ontario, Canada, diagnosed in 2003 with HIV (230 cells/uL CD4 cell count nadir and a 23,625 copies/mL viral load). While on TAF/FTC/RPV ART, his CD4 cell count was 391 cells/uL (February, 2020), with an undetectable viral load (January, 2021). His first ChAdOx1 vaccination was March 31st, 2021.

On May 28th, 2021, his viral load climbed to 422 copies/mL, despite a reported perfect medication compliance, with no medication changes or infections. Resistance testing showed no mutations. On June 7th, 2021, his viral load decreased to 102 copies/mL, then became undetectable ten days later. On June 22nd, 2021, he received the BNT162b2 vaccine. Viral loads on June 29th, and July 28th, 2021, remained undetectable. Of note, he requested to change from TAF/FTC/RPV to DTG/FTC on June 25th, 2021.

This case report is unique in that the viral blip was found eight weeks post-ChAdOx1, and may have been higher if it had been measured 2-3 weeks post-ChAdOx1 vaccine. Additionally, a viral blip was not observed (both one and five weeks) post-BNT162b2 vaccination. Finally, mixing COVID-19 vaccines is novel and this case may provide additional safety data and considerations for PLWH receiving mixed vaccines.

266 Analysis of placental inflammatory markers according to the class of antiretroviral therapy used during pregnancy in women living with HIV

Stephanie Hindle[1], Sylvie Girard[1,2], Marie-Eve Brien[2], Florence Pelletier[2], Frédérique Giguère[2], Mei Juan Trudel[2], Dorothée Dal Soglio[2], Fatima Kakkar[2], Hugo Soudeyns[2], Isabelle Boucoiran[1,2]
[1]Université de Montréal, Montréal, Canada, [2]Centre hospitalier universitaire de Sainte-Justine, Montréal, Canada

Introduction: The use of Antiretroviral therapy (ART) drastically reduces vertical transmission of HIV. However, recent studies have demonstrated associations between ART use during pregnancy and placental dysfunction and inflammation, particularly within protease inhibitor (PI)-based regimens. We sought to analyze the relationship between the class of ART used during pregnancy and associated placental inflammation.

Methods: The placentas of 81 women living with HIV (WLWH) who were treated with ART since the time of conception and 30 uninfected women were collected. All pregnancies were full term. WLWH were stratified into three groups based on classes of ART: 22 women were treated with nucleoside reverse transcriptase inhibitors (NRTI) + non-nucleoside reverse transcriptase inhibitors (NNRTI), 26 were on NRTI + integrase inhibitors (II), and 33 were on NNRTI+PI. Four randomly selected areas within the villi of each placenta were used to measure cell surface expression of CD45, CD68 (M1; proinflammatory), and CD163 (M2; anti-inflammatory) using immunohistochemistry.

Results: Placentas from WLWH contained significantly more CD45+ cells than those from the uninfected controls ($p<0.05$). Significantly higher numbers of total and M2 macrophages were observed in placentas from the NNRTI+II ($p=0.01$) and NNRTI+PI ($p=0.001$) groups compared with uninfected controls, while significantly higher M2/M1 ratios were found in placentas from the NRTI+NNRTI group ($p=0.01$). There were no significant differences between placentas from WLWH and uninfected controls in terms of M1 macrophages.

Conclusion: Placentas from WLWH who were treated on any class of ART during their entire pregnancy exhibited higher levels of anti-inflammatory macrophages compared to uninfected women despite controlling for viral load. Further investigations into the role of M2 cells in the context of macrophage-mediated compensatory mechanisms are required to suggest a protective effect with regards to ART-associated placental dysfunction.

285 Identifying engagement in HIV care among people living with HIV enrolled in the Canadian HIV Observational Cohort (CANOC) from 2013 to 2016

Ioana A. Nicolau[1], Mostafa Shokoohi[1], Abigail Kroch[2], Niloufar Aran[3,4], Erin Ding[3], Nic Bacani[3], Nisha Andany[17,5], Tony Antoniou[6], Ann Natalie Burchell[7,6,8], Curtis Cooper[9,10], Deborah Kelly[11], Marina Klein[12,13], Julio Montaner[3,14], Stephan Sanche[15], Réjean Thomas[16], Sharon Walmsley[17], Alex Wong[15], Robert Hogg[3,4], Mona Loutfy[18,19,8]

[1]Dalla Lana School of Public Health, University of Toronto, Toronto, Canada, [2]Ontario HIV Treatment Network, Toronto, Canada, [3]BC Centre for Excellence in HIV/AIDS, Vancouver, Canada, [4]Simon Fraser University, Burnaby, Canada, [5]Division of Infectious Diseases, Sunnybrook Health Sciences Centre, University of Toronto, Toronto, Canada, [6]Unity Health Toronto, St Michael's Hospital, Toronto, Canada, [7]Department of Family and Community Medicine, University of Toronto,, Toronto, Canada, [8]University of Toronto, Toronto, Canada, [9]Ottawa Hospital, Ottawa, Canada, [10]University of Ottawa, Ottawa, Canada, [11]School of Pharmacy, Memorial University, St. John's, Canada, [12]McGill University Health Centre, Montreal, Canada, [13]CIHR Canadian HIV Trials Network, Vancouver, Canada, [14]University of British Columbia, Vancouver, Canada, [15]College of Medicine, University of Saskatchewan, Saskatoon, Canada, [16]Clinique médicale l'Actuel, Montreal, Canada, [17]Department of Medicine, University of Toronto, Toronto, Canada, [18]Maple Leaf Medical Clinic, Toronto, Canada, [19]Women's College Research Institute, Toronto, Canada

Background: The HIV care cascade monitors the success of HIV care programs by assessing that people living with HIV (PLWH) are linked to care, on combination antiretroviral therapy (cART), and are virally suppressed. We sought to characterize and determine correlates of HIV care engagement among participants of a large Canadian clinical cohort from 2013 to 2016.

Methods: Data from PLWH were obtained from CANOC's 11 sites in 5 provinces. We estimated annual proportions meeting the engagement in care indicators: 1) in care (1 viral load, VL, per year); 2) on cART (at least one prescription per year); and 3) viral suppression (<200 copies/mL). We assessed correlates for each indicator using generalized estimating equation with log-link and binomial distribution.

Results: From 2013 to 2016, there was an increase in the proportions of participants in care, on cART, and with suppressed viral load (Table 1). Similar increases were observed across provinces, genders, age groups, hepatitis C virus (HCV) status, and HIV risk factors. The annual proportion of participants with viral suppression was < 90% for females, age <30, people who inject drugs (PWID), HCV, non-men sex with men (non-MSM), and Saskatchewan. We found lower odds of care engagement for PLWH in Saskatchewan vs. British Columbia, and for PWID and heterosexual HIV risk category compared to MSM only.

Conclusions: We observed high proportions of HIV care engagement which increased over time and identified factors that correlated with lower odds of engagement. These findings suggest the need for targeted care engagement programs and initiatives.

Supporting Document

Table 1. HIV care cascade nested estimates among CANOC participants, 2013-2016

	Cascade indicators (%)			
Year	In care[1]	On cART[2]	VL supression[3]	CANOC participants (N)
2013	96.87%	95.26%	92.29%	9,646
2014	97.52%	96.74%	92.75%	9,988
2015	98.45%	98.13%	93.41%	10,194
2016	99.28%	99.30%	93.89%	10,112

Abbreviations: VL, viral load; cART, combination antiretroviral therapy
[1] Proportion in care (defined as 1 VL per year, numerator) of CANOC participants (N, denominator)
[2] Proportion on cART (defined as a prescription per year, numerator) of individuals in care (denominator)
[3] Proportion of VL suppression (defined as <200 copies/mL on two VL tests at least 90 days apart, numerator) of individuals on cART (denominator).

289 Transforming HIV Care: The Virtual Community Care Clinic (VC3) Model for On-Reserve Communities

Cara Spence[1,2,3], Stuart Skinner[1,3], Stephen Lee[1,3,4], Stephanie Konrad[5], Britin Mason[3], Mamata Pandey[3,4], Marina Klein[2]
[1]University Of Saskatchewan, Saskatoon, Canada, [2]McGill University, Montreal, Canada, [3]Wellness Wheel, Regina, Canada, [4]Saskatchewan Health Region, Regina, Canada, [5]Government of Canada Indigenous Services Canada, Regina, Canada

Background: Lack of and/or limited access to medical care has been an ongoing concern for on-reserve Indigenous communities. The Wellness Wheel medical team provides specialized clinical care for HIV positive individuals residing on-reserve. In a rapid response to the COVID-19 pandemic, the Wellness Wheel implemented a Virtual Community Care Clinic (VC3) to ensure the continuous and ongoing access to healthcare for HIV positive patients. A virtual and hybrid community care model was initiated for the remote delivery, monitoring, diagnosis, and access to treatment to minimize the overall impact of the pandemic in partner communities. The VC3 provided real-time and multi-disciplinary care to HIV patients in communities and visits, access to treatment and viral suppression was recorded.

Findings:
Transforming healthcare through virtual care has resulted in an increase in number of visits and better clinical outcomes and suppression rates among HIV clients in on-reserve communities during the pandemic. Using virtual technology to support in-community care resulted in an increase in the engagement in care through the VC3 model, resulting in a remarkable improvement in 90-90-90 targets despite COVID-19. Establishing virtual care to on-reserve communities has expanded access to care through a hybrid model, whereby community care providers continue to provide culturally responsive care.

Significance:
The VC3 met its goal to mitigate the impact of COVID-19 for HIV patients living in on-reserve communities in Saskatchewan and due to reduced barriers, in fact, improved access to care and treatment in on-reserve communities. The VC3 established a secure platform for the continued access to care during the onset of the pandemic, and integrated virtual care into standard care to support a hybrid model. Ongoing care, knowledge sharing and mobilization provided by the VC3 has transformed care delivery, addressing health care inequities, and should be considered as an important part of HIV care going forward.

291 Type and Timing of Antiretroviral Therapy During Pregnancy: Impact on Risk of Preterm Delivery and Small-for-Gestational-Age in Canada, A Retrospective Cohort Study

Jillian Schneidman[1], Terry Lee[2], Sabrina Carvalho[3,4], Laura Sauve[5], Lindy Samson[6], Jason Brophy[6], Ari Bitnum[7], Joel Singer[8,9], Deborah Money[10,11], Fatima Kakkar[12], Isabelle Boucoiran[13,14]
[1]Faculty of Medicine and Health Sciences, McGill University, Montreal, Canada, [2]CIHR Canadian HIV Trials Network, Vancouver, Canada, [3]Faculty of Pharmacy, Université de Montréal, Montreal, Canada, [4]Research Centre of the Saint-Justine University Hospital, Université de Montréal, Montreal, Canada, [5]Department of Pediatrics, British Columbia Women's Hospital and Health Centre, University of British Columbia, Vancouver, Canada, [6]Department of Pediatrics, Children's Hospital of Eastern Ontario, University of Ottawa, Ottawa, Canada, [7]Department of Pediatrics, The Hospital for Sick Children, University of Toronto, Toronto, Canada, [8]Department of Health Care and Epidemiology, University of British Columbia, Vancouver, Canada, [9]CIHR Canadian HIV Trials Network, Vancouver, Canada, [10]Department of Obstetrics and Gynecology, British Columbia Women's Health Research Institute, Vancouver, Canada, [11]Women's Hospital and Health Centre, University of British Columbia, Vancouver, Canada, [12]Department of Pediatrics, CHU Sainte-Justine, Université de Montréal, Montreal, Canada, [13]School of Public Health, Université de Montréal, Montreal, Canada, [14]Department of Obstetrics and Gynecology, CHU Sainte-Justine, Université de Montréal, Montreal, Canada

Introduction: Antiretroviral therapy (ART) has successfully reduced vertical transmission of HIV in high- and middle- income countries. However, concerns have followed about the impact of ART on obstetrical outcomes. Our objective was to evaluate the impact of ART regimen type and exposure duration on the risk of preterm delivery (PTD) and small-for-gestational-age (SGA) births among pregnant people living with HIV in Canada.

Methods: Data was analyzed from the Canadian Perinatal HIV Surveillance Program between 1990-2020, which captures data from twenty-two sites on infants perinatally exposed to HIV. The association between ART use and risk of PTD (<37 weeks) and SGA (<10th percentile) was explored using mixed effects logistic regression and time-dependent Cox's proportional hazards models.

Results/Discussion: Among the PTD and SGA cohorts, there were 14.9% (654/4379) cases of PTD and 18.5% (732/3947) cases of SGA respectively. A higher risk of PTD was observed with non-nucleoside reverse transcriptase inhibitor (NNRTI)-based (aHR=1.73; 95% CI=1.10-2.73) and boosted protease inhibitor (PI)-based (aHR=1.68; 95% CI=1.15-2.45) regimens compared to integrase strand transfer inhibitor (INSTI)-based regimens. ART initiation prior to conception was associated with a lower risk of SGA compared to ART initiation post conception at 1-14 weeks (aOR=0.69; 95% CI=1.05-2.00) and > 14 weeks (aOR=0.70; 95% CI=1.11-1.86).

Conclusions: INSTI-based ART regimens were associated with lower risk of PTD compared to NNRTI-based and boosted PI-based regimens, and ART initiation before conception was associated with a lower risk of SGA. Findings with overall safety data should be considered when providing pregnancy counselling to people living with HIV.

Supporting Document

Variable	PTD (n=2805)		SGA (n=2699)	
	HR (95% CI)	aHR (95% CI)*	OR (95% CI)	aOR (95% CI)*
ART regimen type				
No treatment	2.00 (1.36, 2.94)	0.89 (0.50, 1.56)	1.12 (0.75, 1.67)	1.02 (0.45, 2.29)
Mono- or bi-therapy	1.29 (0.82, 2.05)	1.44 (0.69, 2.99)	0.77 (0.49, 1.21)	0.59 (0.24, 1.45)
NRTI + NNRTI	1.41 (0.94, 2.10)	**1.73 (1.10, 2.73)**	0.83 (0.58, 1.19)	0.90 (0.59, 1.38)
NRTI + unboosted PI	1.31 (0.89, 1.94)	1.36 (0.82, 2.25)	1.04 (0.74, 1.47)	0.77 (0.47, 1.25)
NRTI + boosted PI	1.72 (1.22, 2.42)	**1.68 (1.15, 2.45)**	1.00 (0.75, 1.34)	0.99 (0.72, 1.37)
NRTI + INSTI	1	1	1	1
Other ART regimen	1.73 (1.13, 2.64)	1.61 (1.00, 2.60)	1.18 (0.80, 1.75)	1.23 (0.78, 1.94)
Start time of ART				
Before conception	1	1	1	1
1-14 weeks	0.99 (0.76, 1.30)	1.05 (0.78, 1.43)	1.22 (0.92, 1.61)	**1.45 (1.05, 2.00)**
>14 weeks	1.15 (0.96, 1.38)	0.93 (0.74, 1.17)	1.33 (1.10, 1.62)	**1.44 (1.11, 1.86)**

Table 1. Association of antiretroviral regimen type and start time during the first 37 weeks of pregnancy with preterm delivery and small-for-gestational-age births; excluding subjects who had non-singleton pregnancies, unknown transmission of HIV, and vertical transmission of HIV.

*Adjusted for viral load closest to delivery, ethnicity, risk factor for HIV infection, region, ART regimen type, and start time of ART.

307 Does a hospital-to-community multi-disciplinary intervention improve outcomes in people living with HIV in Saskatoon?

Yvonne Blonde[1], **Katelyn Roberts**, Sharon Clarke, Kathy Malbeuf, Brenda Jackson
[1]*University Of Saskatchewan, College of Medicine, Saskatoon, Canada*

In 2017, amidst a syndemic background (HIV/HCV/substance use,) local stakeholders and community organizations were concerned about a cohort of people living with HIV (PLWH) in Saskatoon who had high hospital utilization. This cohort frequently left hospital against medical advice, did not link to outpatient care, and had poorer HIV-specific outcomes. Contributing system-level gaps included equitable hospital policies, i.e.: harm reduction, person-centered care, and coordinated outreach. The community team devised an innovative multidisciplinary intervention, the HIV/AIDS Rapid Response Team (HART), which is designed to connect with PLWH in hospital and transition them into community-based care and services. This 'wrap-around' care prioritizes the complex social needs of the population. The study objective was to evaluate whether this intervention improved outcomes.

Methods: This was a single group pretest-posttest analysis at 0, 3, and 6mth timepoints using routinely collected HART data. The primary outcome was viral load (VL) suppression and the secondary outcomes included housing status, number of financial supports, and self-reported health. Process outcomes included duration of the intervention.

Results: 131 patients were included at baseline. VL's were significantly lower at the end of the intervention (238,971 p=0.0016.) Co-infection with HCV predicted a lower 3mth VL (126,990 p=0.042.) More people were receiving ARV's at both 3 and 6mths (34.1 p=0.000 and 29.4 p=0.000.) Fewer people were living with homelessness at 3mths (25.6 p=0.00) and this was sustained at 6mths (19 p=0.0005.) Income supports increased at 3 and 6mths (9 p=0.012, 18 p=0.011.) Self-reported impaired mobility was lower at 6months (9.8 p=0.037.) Attrition was low at 3mths (N=116.)

Conclusions: HART improved HIV-specific outcomes for PLWH in this study. Intervention components seem well-matched to the needs of the target population, specifically the relationship-driven model, organizational flexibility and in-hospital advocacy. Focus-group discussions with communities for giving back knowledge and developing recommendations are upcoming.

309 Effect of Antimicrobial Agents on Foreskin Epithelial Integrity

Lane Buchanan[1], Ronald Galiwango[2,3], Rupert Kaul[2], Zhongtian Shao[1], David Zuanazzi[1], Jessica Prodger[1,4]

[1]Western University, Department of Microbiology & Immunology, London, Canada, [2]University of Toronto, Department of Immunology, Toronto, Canada, [3]Rakai Health Sciences Program, Kalisizo, Uganda, [4]Western University, Department of Epidemiology & Biostatistics, London, Canada

Background: Specific taxa of anaerobic bacteria in the penile microbiome have been associated with risk of HIV acquisition. Some evidence shows that this may be driven by local inflammation, resulting in HIV target cell recruitment to the foreskin. However, these anaerobes may also increase HIV susceptibility by disrupting foreskin epithelial barrier function. This hypothesis was tested by removing penile anaerobes with antimicrobials.

Methods: A randomized trial with 125 HIV-negative uncircumcised men was conducted in Entebbe, Uganda. Participants were randomized to a control group which underwent circumcision immediately, or to defer circumcision for 4 weeks and receive either tinidazole, metronidazole, clindamycin, or hydrogen peroxide. Foreskin tissues were stained for the protein filaggrin to mark the keratin layer, as well as epithelial junction proteins E-Cadherin, Desmoglein-1, and Claudin-1. Whole-tissue fluorescence microscopy images were taken and analyzed for the following epithelial integrity metrics: keratin thickness, epithelial thickness, and epithelial junction protein expression.

Results: Men receiving clindamycin or tinidazole treatments had a thinner inner foreskin keratin layer than control men (16.06,17.07µm vs 20.58µm, p=0.0154,0.0266). Combining all topical treatment groups, significantly higher inner foreskin E-Cadherin expression was observed than in control men (0.1264MFI vs 0.1078MFI, p=0.0477). This effect was seen especially with metronidazole (0.1311MFI, p=0.0350). Men receiving hydrogen peroxide had higher foreskin Claudin-1 expression than control men (0.1542MFI vs 0.1358MFI, p=0.0136). No significant differences were observed between groups for epithelial thickness or Desmoglein-1 expression, nor when looking at outer foreskin tissue alone for any metric.

Discussion: A thinner keratin layer may represent compromised foreskin barrier integrity, leaving participants susceptible to HIV and other pathogens. Higher epithelial junction protein expression for some treatments provides evidence that penile anaerobes may cause downstream cleavage of epithelial junctions. Further mechanistic research is required, as well as microbiome data to determine the effects of specific bacterial taxa on epithelial integrity.

325 Prolonged Amenorrhea and Liver Fibrosis in Women Living with HIV Enrolled in the Children and Women: AntiRetrovirals and Markers of Aging (CARMA) Study

Elizabeth Theemes-Golding[1], Elizabeth M King[2,4], Ulrike Mayer[2], Arianne Y Albert[2], Helene CF Cote[2,5], Jerilynn C Prior[6,7,8,2], Evelyn J Maan[2,3], Neora Pick[2,3,4], Melanie CM Murray[2,3,4]
[1]School of Kinesiology, UBC, Vancouver, Canada, [2]Women's Health Research Institute, British Columbia Women's Hospital, Vancouver, Canada, [3]Oak Tree Clinic, British Columbia Women's Hospital, Vancouver, Canada, [4]Division of Infectious Disease, Department of Medicine, UBC, Vancouver, Canada, [5]Department of Pathology and Laboratory Medicine, UBC, Vancouver, Canada, [6]Centre for Menstrual Cycle and Ovulation Research, UBC, Vancouver, Canada, [7]Department of Medicine, Division of Endocrinology, UBC, Vancouver, Canada, [8]School of Population and Public Health, UBC, Vancouver, Canada

Background: Prolonged amenorrhea is frequent in women living with HIV (WLWH) and associates with hypothalamic dysfunction (e.g. low estrogen, progesterone). Through their endogenous antioxidant properties, these sex hormones can slow hepatic fibrosis. Hence, their loss is associated with liver fibrosis progression. The relationship between amenorrhea and the Aspartate transaminase to Platelet Ratio Index (APRI) score, a validated indicator of liver fibrosis, was examined in WLWH and controls.

Methods: WLWH and controls ≥16 y were enrolled in the CARMA-Endo study (2013-2017). Amenorrhea was defined as past/present amenorrhea for ≥1 year unrelated to pregnancy, contraceptives, surgery, or menopause. Liver fibrosis was assessed via APRI score. Demographic and clinical variables were compared using Wilcoxon rank sum and Fisher's exact tests. Linear multivariable models determined relationship between amenorrhea and APRI score, adjusting for potential confounders; interaction between HIV-status and amenorrhea on APRI score was examined.

Results: WLWH (n=181) were similar to controls (n=130) in age and body mass index (BMI). More WLWH had Hepatitis C virus (HCV) antibodies (39.2% vs. 6.9%, p<0.001), while amenorrhea and mean APRI scores were higher in WLWH versus controls (23.2% vs 10.0%, p=0.003; 0.6 vs 0.4, p<0.0001). Participants with amenorrhea had 0.21 (0.03-0.38; p=0.023) higher APRI scores than participants without, after adjusting for BMI, HCV, HIV status, smoking, drug use and employment. No interaction was found between HIV and amenorrhea on APRI (p=0.07). Amongst WLWH, suppressed viral load and higher CD4 were associated with lower APRI (-0.37 [-0.61 to -0.14], p=0.002; -0.043 [-0.072 to -0.014], p=0.004 /100 units CD4 increase). Participants with longer non-NRTI exposure had higher APRI scores (0.008 [0.001 – 0.016], p=0.034 per year of non-NRTI).

Conclusion: Women with amenorrhea history had higher APRIs than those with normal menstrual cycles, independent of HIV status, indicating that amenorrhea is a potential additional risk factor for hepatic fibrosis.

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20 Early implementation challenges and successes of adapting and scaling-up Peer Navigation for homeless and street-involved youth in Canada and Kenya

Katie MacEntee[1], Abe Oudshoorn[2], Alex Abramovich[3], David Ayuku[4], Amy VanBerkum[3], Olli Saarela[1], Thai-Son Tang[1], Edith Apondi[5], Juddy Wachira[6], Reuben Kiptui[6], Paula Braitstein[1], Edward Ou Jin Lee[7], Sue-Ann MacDonald[7]
[1]Dalla Lana School Of Public Health, University Of Toronto, Toronto, Canada, [2]Arthur Labatt Family School of Nursing, Western University, London, Canada, [3]Institute for Mental Health Policy Research, Centre for Addiction and Mental Health, Toronto, Canada, [4]School of Medicine, Moi University, Eldoret, Kenya, [5]Moi Teaching and Referral Hospital, Eldoret, Kenya, [6]Academic Model Providing Access to Healthcare in Eldoret Kenya, Eldoret, Kenya, [7]École de Travail Social, Université de Montréal, Montreal, Canada

Peer navigation is a promising model for increasing engagement with HIV health services. Here, we consider the early stages of implementing peer navigators (PN) to increase access to HIV services among street-involved youth (SIY) in Kenya and Canada. This includes how PNs integrate into host institution activities and the greater service sector network in preparation for supporting SIY. Challenges and facilitators were documented during monthly research meetings. Analysis followed the Consolidated Framework for Implementation Research (CFIR) to organize and guide interpretations of the challenges and facilitators to the PNP implementation process.

Challenges were associated with: (1) recruiting PN; (2) COVID-19; (3) HIV criminalization in Canada; (4) hiring policies, (5) expectations of support; (6) limits in infrastructure resources; and (7) cross-site PN training. Facilitators were observed emerging from (1) COVID-19; (2) service provision networks and relationships; and (3) PN champions.

Navigating these early implementation components has resulted in hiring and integrating PNs in five out of six project sites. Considering the early challenges and facilitators of implementation shapes scale-up activities by identifying further areas for adaptation and systemic barriers in institutional policies that must be addressed to optimize the use of peer-models when responding to the HIV prevention, treatment and testing needs of SIY.

26 Knowledge of hepatitis C and awareness of reinfection risk among people who successfully completed direct acting antiviral therapy

Kiana Yazdani[1], Katerina Dolguikh[1], Wendy Zhang[1], Sara Shayegi-Nik[1,4], Jessica Ly[1], Shaughna Cooper[1], Jason Trigg[1], Sophia Bartlett[2,4], Rolando Barrios[1], Julio Montaner[1], Kate Salters[1,3]
[1]BC Center for Excellence in HIV/AIDS Research, Vancouver, Canada, [2]British Columbia Centre for Disease Control, Vancouver, Canada, [3]Simon Fraser University, Burnaby, Canada, [4]University of British Columbi, Vancouver, Canada

Background: Hepatitis C virus (HCV) education may be changing following the simplification of HCV treatment and emergence of direct acting antiviral (DAA). We aimed to characterize HCV knowledge among people who recently completed DAA therapy.

Methods: The Per-SVR (Preservation of Sustained Virologic Response) is a prospective cohort of patients who achieved a sustained virologic response upon successful completion of DAA therapy. The primary aim of the study is to characterize HCV reinfection rates and factors associated with reinfection. The per-SVR study provided the sampling frame of participants who completed a psychometrically validated HCV knowledge scale at cohort entry (n=227). We assessed mean HCV knowledge score in the overall sample and not mutually exclusive key populations: baby boomers (n=178); people with indication of injection drug use (IDU) (n=100); people with HIV co-infection (n=50). Using a latent class analysis, we identified latent groups and assessed HCV knowledge amongst them.

Results: The median age (Q1, Q3) was 52 years (44, 59) and 64.8% were men. Total mean (SD) percent of correct responses were 83 (0.11) in the overall sample; 0.82 (0.11) in baby boomers; 0.83 (0.10) in people with indication of IDU; 0.80 (0.11) in people with HIV co-infection. Three latent groups were identified: baby boomers who ever experienced homelessness (n=126); women sex workers who ever experienced homelessness (n=68); men with indication of IDU who ever experienced homelessness and had ever diagnosis of mental health disorders (n=18). Knowledge level remained high in the identified latent groups and similar to that of the overall sample.

Conclusion: Patients successfully treated with DAAs had a high HCV knowledge. High knowledge and awareness of reinfection among complex patient groups often facing barriers to HCV care is encouraging and emphasizes the positive outcomes of universal access to treatment.

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29 Economic evaluation of HIV testing options for low-prevalence high-income countries: a systematic review

Olanrewaju Medu[1,2,3], Adegboyega Lawal[2], Doug Coyle[3], Kevin Pottie[3,4]
[1]Saskatchewan Health Authority, Regina, Canada, [2]University of Saskatchewan, Saskatoon, Canada, [3]University of Ottawa, Ottawa, Canada, [4]Bruyere Research Institute, Ottawa, Canada

Introduction: This study reviewed the economic evidence of rapid HIV testing versus conventional HIV testing in low-prevalence high-income countries; evaluated the methodological quality of existing economic evaluations of HIV testing studies; and made recommendations on future economic evaluation directions of HIV testing approaches.

Methods: A systematic search of selected databases for relevant English language studies published between Jan 1, 2001, and Jan 30, 2019, was conducted. The methodological design quality was assessed using the Consolidated Health Economic Evaluation Reporting Standards (CHEERS) and the Drummond tool. We reported the systematic review according to the PRISMA guidelines.

Results: Five economic evaluations met the eligibility criteria but varied in comparators, evaluation type, perspective, and design. The methodologic quality of the included studies ranged from medium to high. We found evidence to support the cost-effectiveness of rapid HIV testing approaches in low-prevalence high-income countries. Rapid HIV testing was associated with cost per adjusted life year (QALY), ranging from $42,768 to $90,498. Additionally, regardless of HIV prevalence, rapid HIV testing approaches were the most cost-effective option.

Conclusions: There is evidence for the cost-effectiveness of rapid HIV testing, including the use of saliva-based testing compared to usual care or hospital-based serum testing. Further studies are needed to draw evidence on the relative cost-effectiveness of the distinct options and contexts of rapid HIV testing.

30 Human Papillomavirus (HPV) Vaccine Uptake over 12 Months among Gay, Bisexual, and Other Men who have Sex with Men (GBM) Living with HIV in Three Canadian Cities

Catharine Chambers[1,2], Shelley Deeks[1,3], Rinku Sutradhar[1,4], Joseph Cox[5], Alexandra De Pokomandy[5], Troy Grennan[6], Trevor Hart[1,7], Gilles Lambert[8], David Moore[9], François Coutlée[10,11], Daniel Grace[1], Ramandip Grewal[1,2], Jody Jollimore[15], Nathan Lachowsky[13], Rosane Nisenbaum[1,2], Gina Ogilvie[14], Chantal Sauvageau[12], Darrell Tan[2], Ann Burchell[1,2]

[1]University of Toronto, Toronto, Canada, [2]Unity Health Toronto, Toronto, Canada, [3]Government of Nova Scotia, Halifax, Canada, [4]ICES, Toronto, Canada, [5]McGill University, Montreal, Canada, [6]British Columbia Centre for Disease Control, Vancouver, Canada, [7]Ryerson University, Toronto, Canada, [8]Direction régionale de santé publique de Montréal, Montreal, Canada, [9]British Columbia Centre for Excellence in HIV/AIDS, Vancouver, Canada, [10]Université de Montréal, Montreal, Canada, [11]Centre de recherche du Centre hospitalier de l'Université de Montréal, Montreal, Canada, [12]Institut national de santé publique du Québec, Quebec, Canada, [13]University of Victoria, Victoria, Canada, [14]University of British Columbia, Vancouver, Canada, [15]Community-Based Research Centre, Vancouver , Canada

Background: HPV is an important HIV co-infection that can be prevented by vaccination. Publicly-funded HPV vaccination programs for GBM and/or those living with HIV aged ≤26 years were implemented in British Columbia (since 09/2015), Québec (01/2016), and Ontario (09/2016; GBM only) due to their high burden of HPV-associated disease. We measured 12-month changes in HPV vaccine uptake among community-recruited GBM cohorts in Vancouver, Toronto, and Montreal.

Methods: A total of 447 GBM living with HIV enrolled in the Engage Cohort Study from 02/2017-08/2019. One-year follow-up visits took place from 03/2018-01/2021 (delayed due to COVID-19 pandemic; median follow-up=12 months, interquartile range=12-13 months). We used univariable logistic regression to identify factors associated with incident vaccination (self-reported receipt of ≥1 dose during follow-up) among participants who were unvaccinated at baseline.

Results: 295 participants (79 Vancouver, 61 Toronto, 155 Montreal) completed ≥1 follow-up visit (66% retention). The median age at baseline was 52 years in Vancouver, 40 years in Toronto, and 51 years in Montreal. Vaccine uptake (≥1 dose) increased from 24.1% at baseline to 27.8% at follow-up in Vancouver, 39.3% to 44.3% in Toronto, and 6.5% to 10.3% in Montreal. Only 10 participants were aged ≤26 years (eligible for public programs); of whom, 70.0% were vaccinated at baseline, increasing to 80.0% at follow-up. Among 242 unvaccinated participants at baseline, incident vaccination by follow-up in each city was 5.0%, 8.1%, and 4.1%, respectively. Factors associated with increased incident vaccination included age ≤45 years (OR=3.99, 95%CI=1.16-13.61), having private insurance (OR=3.34, 95%CI=1.02-10.88), and being diagnosed with anogenital warts (OR=7.17, 95%CI=1.28-40.08).

Conclusions: Despite being at higher risk, less than half of GBM living with HIV were vaccinated against HPV in Canada's three largest cities. Most were ineligible for publicly-funded programs. Findings suggest the need for expanded age eligibility or insurance coverage for HPV vaccines.

32 The Effective Coverage Cascade: A research and implementation framework for optimizing effective coverage of equitable HIV and STBBI prevention and care services for priority populations

Leigh McClarty[1], Marissa Becker[1], Patricia García[2], Helen Ward[3], Sevgi Aral[4], James Blanchard[1]
[1]Institute for Global Public Health, University of Manitoba, Winnipeg, Canada, [2]Cayetano Heredia University, Lima, Peru, [3]Imperial College London, London, England, [4]Centers for Disease Control and Prevention, Atlanta, USA

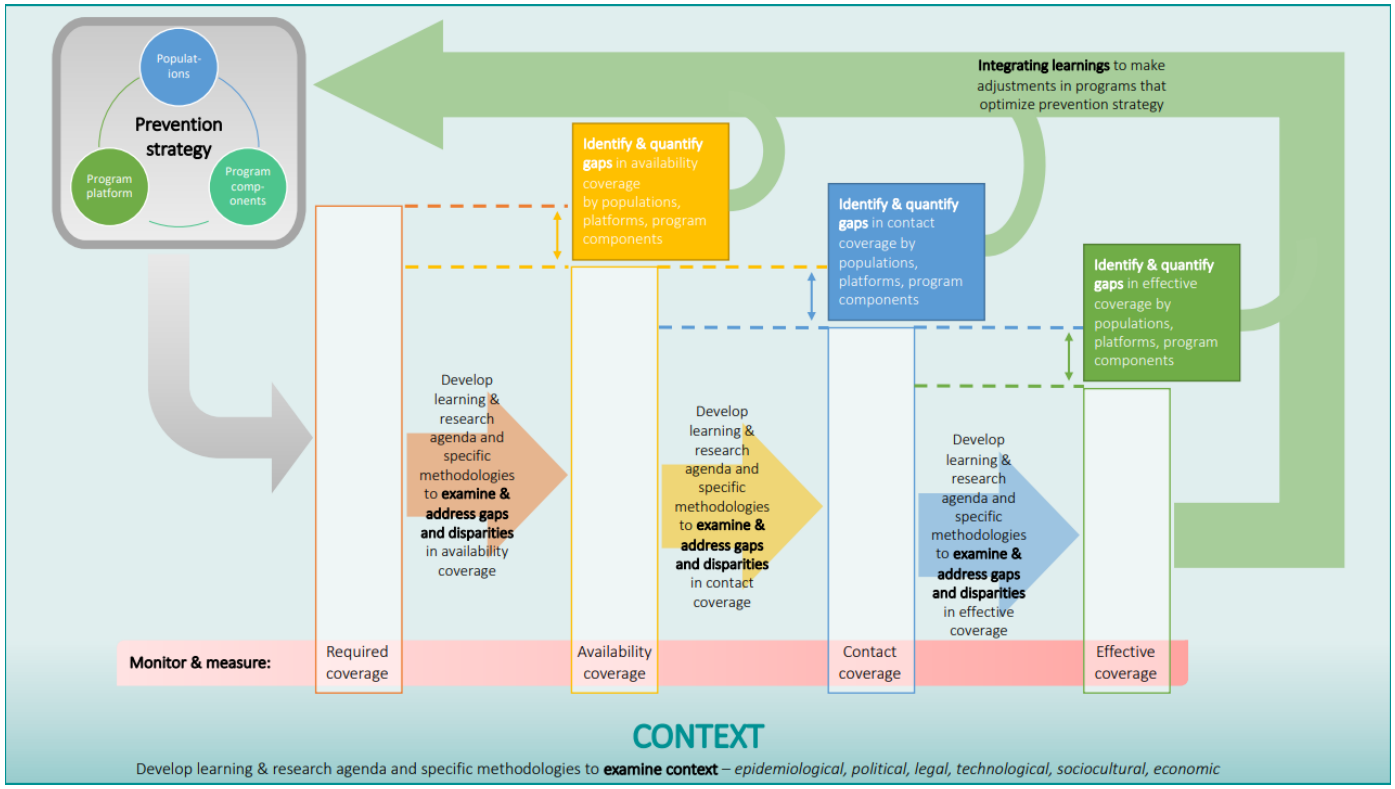
Background: Despite substantial progress over many decades, continued improvements in programming remain essential to address HIV/STBBI epidemics. Persistent gaps between public health sciences and approaches to optimize service coverage in public health programs for priority populations contribute to these shortcomings. Programs require timely, context-specific evidence for refinement and adaptation to address gaps and improve inequities in health outcomes.

Methods: During February-July 2021, we hosted a virtual workshop series to develop a research and implementation framework for HIV/STBBI prevention and care programs. The framework serves as one tool for facilitating the integration of embedded research into programs to support equity-focused programming and optimize population-level outcomes.

Results: The Effective Coverage Cascade framework (Figure) expands upon prevention and treatment cascades and health service coverage models. Centred on Program Science and grounded in public health programming, the framework guides the development of program-embedded research agendas that iteratively generate evidence for program optimization and equitable population-level health outcomes. By identifying and quantifying gaps in four dimensions of HIV/STBBI service coverage (required-, availability-, contact-, effective-), this framework examines inequities in coverage, considers how context influences them, and informs strategies to address them through program-generated evidence-informed refinements.

Discussion: Strategies and frameworks for operationalizing principles of health equity and measuring progress toward equity remain scarce. The Effective Coverage Cascade framework is a novel tool to address this gap. Health service coverage is a fundamental element of achieving equity in HIV/STBBI outcomes; greater consideration for how to optimize and expand delivery strategies and platforms for HIV/STBBI services is critical.

Supporting Document



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36 Contextual Factors Impact the Risk of HIV Infection in South African Townships: A Bayesian Analysis of Secondary Trial Data

Cindy Leung Soo[2], Nitika Pant Pai[1], Susan Bartlett[2], Aliasgar Esmail[3], Keertan Dheda[3], Sahir Bhatnagar[2]
[1]Research Institute of The Mcgill University Health Center, Montreal, Canada, [2]McGill University, Montreal, Canada, [3]University of Cape Town, Cape Town, South Africa

Background: With a prevalence almost twice as high as the national average, South African townships are particularly impacted by the HIV epidemic. Yet, it remains unclear whether the risk of acquiring HIV differs across townships and what role contextual variables play in predisposing individuals to HIV infection. Our objective is to explore whether contextual factors impact the risk of HIV infection.

Methods: Using Bayesian logistic regression, we analysed secondary data from a quasi-randomised trial on HIV self-testing. Our trial (N = 3095) recruited participants from the townships of Cape Town: Klipfontein, Mitchell's Plain and Western. Contextual factors included township of residence, type of dwelling, employment status and education/ income level. We obtained priors for age and sex from the extant literature. We accounted for the uncertainly due to missing data through multiple imputation. We calculated the posterior medians, 89% and 95% credible intervals of the adjusted odds ratios.

Results: After controlling for age, sex and other contextual variables, participants residing in Mitchell's Plain and Western townships were at increased odds of HIV infection compared to participants from Klipfontein. Furthermore, those living in hostels or informal dwellings were at greater odds of acquiring HIV infection relative to those living in a house. Finally, individuals without post-secondary education had nearly twice the odds of having an HIV infection compared to those with a post-secondary education (Table).

Conclusions: Understanding how contextual factors impact risk of acquisition of HIV infection can help inform HIV prevention programs and optimize targeted screening initiatives for township populations.

Supporting Document

Table

Posterior median, 89% and 95% credible intervals of the adjusted odds ratios

	Odds Ratio	89% CI	95% CI
Age	1.01	0.99 - 1.02	0.99 - 1.02
Sex			
Male		Ref	
Female	1.01	0.79 - 1.28	0.75 - 1.36
Township			
Klipfontein		Ref	
Mitchell's Plain	1.64	1.25 - 2.18	1.17 - 2.32
Western	1.29	0.97 - 1.72	0.91 - 1.84
What sort of dwelling do you live in?			
Formal house or other		Ref	
Hostel or informal dwelling	1.31	1.05 - 1.63	1 - 1.72
What is your work situation?			
Employed (part-time or full-time)		Ref	
Not employed or retired	0.96	0.75 - 1.22	0.71 - 1.29
What is your highest level of education?			
Graduate, undergraduate or college		Ref	
High school, primary school or no schooling	1.93	1.38 - 2.71	1.29 - 2.95
What is your monthly income?			
>9000 R		Ref	
6001-9000 R	1.12	0.55 - 2.31	0.46 - 2.72
3000-6000 R	0.73	0.4 - 1.33	0.35 - 1.53
<3000 R	1.15	0.66 - 2.03	0.59 - 2.31

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46 Six lessons for COVID-19 rehabilitation from HIV rehabilitation

Darren Brown[1], Kelly O'Brien[2], Jo Josh[3], Stephanie Nixon[2], Jill Hanass-Hancock[4], MaryLou Galantino[5], Hellen Myezwa[6], Soula Fillipas[7], Colm Bergin[8], Larry Baxter[9], Mark Binette[7], Verusia Chetty[4], **Saul Cobbing[4]**, Colin Corbett[1], Francisco Ibanez-Carrasco[2], David Kietrys[10], Ronel Roos[6], Patricia Solomon[11], Richard Harding[12]

[1]Chelsea and Westminster NHS Foundation Trust , London, England, [2]University of Toronto, Toronto, Canada, [3]British HIV Association, Letchworth, England, [4]University of KwaZulu-Natal, Durban, South Africa, [5]Stockton University , Galloway, United States of America, [6]University of the Witwatersrand, Johannesburg, South Africa, [7]Alfred Hospital, Melbourne, Australia, [8]Trinity College, Dublin, Republic of Ireland, [9]Dalhousie University, Halifax, Canada, [10]Rutgers University, Blackwood, United States of America, [11]McMaster University, Hamilton, Canada, [12]King's College, London, England

Background: The COVID-19 pandemic is comparable to the HIV pandemic. It is an infection that presents with diverse functional problems amplified by other health conditions and aging, and disproportionately affects vulnerable populations, including people living with HIV (PLHIV). The multi-system challenges experienced by people living with Long Covid is also comparable to the episodic disability described by PLHIV. Rehabilitation is a fundamental health service that enables greater participation in education, employment, and community life. The HIV and rehabilitation leadership has provided a model for informing rehabilitation responses for other chronic conditions.

Purpose: Nineteen researchers, scientists and activists from seven countries with years of experience working in the field of HIV, disability, and rehabilitation collaborated to present key lessons outlining how HIV rehabilitation can inform COVID-19 rehabilitation.

Lessons learnt: Six key lessons emerged from this collaboration, namely: 1) Anticipate disability during and after acute management of COVID-19 and recognize its potentially episodic nature; 2) Understand that the disability dimension “Uncertainty or Worry About the Future” may play a role in COVID-19–related disability; 3) Develop disability- and rehabilitation-focused responses to COVID-19, as in the 2016 Political Declaration of HIV and AIDS; 4) Prepare for the long-term impact of COVID-19 on key and vulnerable populations to help prevent inequality, stigma, and unintended social consequences, making every effort to leave no one behind; 5) Build on existing research networks in HIV rehabilitation to provide foundations for developing the field of COVID-19 Rehabilitation; 6) Include and focus on people living with and affected by the infection in all responses to the pandemic.

Conclusion: Rehabilitation is effective in managing the multi-system effects of communicable viral diseases, including both HIV and COVID-19. Lessons from HIV rehabilitation can expedite evidence-based community-engaged rehabilitation responses to COVID-19 that are designed for, and include the input of, vulnerable populations.

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48 Exploring experiences engaging in exercise from the perspectives of women living with HIV: A qualitative study

Nora Sahel-Gozin[1], Mona Loutfy[2], **Kelly O'Brien[3]**
[1]University Of Toronto, Toronto, Canada, [2]University Of Toronto, Toronto, Canada, [3]University Of Toronto, Toronto, Canada

Objectives: Despite the benefits of exercise among people living with HIV, their engagement in exercise is variable, and more so for women with HIV. Our aim was to explore experiences engaging in exercise among women living with HIV, specifically i) the nature and extent of exercise, ii) factors that characterize exercise experiences, iii) perceived impacts, iv) challenges and barriers, and v) recommendations for uptake.

Methods: We conducted a qualitative descriptive study involving web-based semi-structured interviews with women living with HIV who may or may not have engaged in exercise (≥150 minutes of moderate-vigorous physical activity/week). We asked about engagement in and perceptions of exercise, perceived impacts, challenges, and recommendations for future uptake. We administered a demographic questionnaire to describe personal, health and exercise characteristics. We conducted a thematic analysis of interview data.

Results: Of the 10 women who participated in the study, the median age was 52 years (25-75th percentile: 57,49), 4(40%) identified as Black or African, and 6(60%) had children. Six (60%) were classified as exercisers and 4(40%) non-exercisers. Women characterized their experiences with exercise with six intersecting themes that included: cultural factors (expectations, intersecting identities, social media, exposure, food diversity), gender (gendered roles, self-care, objectification, social norms, self-defense), stigma (misconceptions, ignorance, discouragement, exercise benefits), episodic nature (symptoms, uncertainty, multi-morbidity), perceptions of exercise (exercise priority determined likelihood to participate; difference between ‘exercise’ and ‘physical activity’), and sense of belonging (lack of community, racial divide, support network). Women perceived benefits of exercise as health promotion. Challenges and barriers to exercise were personal and environmental. Recommendations included providing resources and support networks to promote exercise with women living with HIV.

Discussion: Experiences with exercise were characterized by multiple intersecting personal and environmental contextual factors. Results may help to inform tailored implementation of exercise as a rehabilitation strategy with women living with HIV.

49 The Pre-exposure Prophylaxis (PrEP) Cascade among Chinese Gay, Bisexual and Men Who Have Sex with Men (MSM) in Toronto

Desmond Chuang[1], Farideh Tavangar[2], Ryan Tran[3], Alan Tai-Wai Li[4], Joshua B. Mendelsohn[5], Sharmistha Mishra[6], Darrell H. S. Tan[7,8]
[1]National Taiwan Normal University, Taipei, Taiwan, [2] St. Michael's Hospital, Toronto, Canada, [3]Asian Community AIDS Services, Toronto, Canada, [4]Regent Park Community Health Centre, Toronto, Canada, [5]Pace University, New York City, USA, [6]University of Toronto, Toronto, Canada, [7]Division of Infectious Diseases, St. Michael's Hospital, Toronto, Canada, [8]Department of Medicine, University of Toronto, Toronto, Canada

Background:
To better understand the potential impact of PrEP in Chinese MSM communities, we quantified an anticipated PrEP cascade in a community-based sample of Chinese MSM in Toronto.

Methods:
Using convenience sampling, we recruited adult Chinese cis-gender men via social media and service agency postings to an online survey during July 2019– December 2020 if they had anal sex with men (past 6 months) and self-identified as HIV-negative or status-unknown. Among respondents deemed suitable for PrEP based on Canadian guideline criteria, we constructed a three-step anticipated PrEP cascade by sequentially quantifying respondents' PrEP awareness, acceptability and drug coverage. Additional questions addressed barriers and facilitators of PrEP access.

Results:
Of 266 participants, 41.0% were born in Canada, 36.1% in Mainland China, and 12.8% in Hong Kong. Most had an undergraduate degree or more (89.1%) and full-time employment (64.7%), but only 41.7% had a family doctor. One third (37.2%) were taking PrEP. Of those not on PrEP (n=167), 119 (71.2%) met PrEP eligibility criteria based on self-reporting condomless anal sex, plus prior syphilis (n=4), rectal gonorrhea/chlamydia (n=21), a sexual partner with detectable viral load (n=32), HIRI-MSM score >10 (n=115), and/or using PEP more than once (n=18). Among eligible non-users of PrEP, 77 (67.7%) were aware of PrEP, 93 (55.6%) were willing to use PrEP, and 89 (74.8%) had any drug coverage. The anticipated cascade suggested that only 46 (27.5%) of PrEP-eligible respondents could likely access PrEP. Barriers included discomfort discussing sexual health, lack of drug coverage, and PrEP-related stigma. Facilitators included PrEP access via community-based venues and decrease psychological concerns about getting HIV.

Conclusion:
Many Chinese MSM in Toronto could benefit from PrEP, but there are gaps in PrEP awareness, acceptability, and drug coverage. Culturally competent, community-driven strategies for overcoming barriers to PrEP are needed for this population.

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51 Factors Associated with HIV Prevalence Among a Canadian Clinical Cohort Of Transgender Women

Ashley Lacombe-Duncan[1,2], Yasmeen Persad[1], Mostafa Shokoohi[3], Angela Underhill[1], Nimâ Machouf[4], Pierre Côté[4], Megan Wheatley[1], Meenakshi Gupta[1], Luke T. Kyne[1], Amir A. Besharati[4], L.Y. Louie Chan[5], Sue Hranilovic[6], Quang Nguyen[5,7], Mona Loutfy[1,8]
[1]Women's College Hospital, Toronto, Canada, [2]University of Michigan, School of Social Work, Ann Arbor, United States, [3]Dalla Lana School of Public Health, University of Toronto, Toronto, Canada, [4]Clinique de Médecine Urbaine du Quartier Latin, Montreal, Canada, [5]Department of Family & Community Medicine, University of Toronto, Toronto, Canada, [6]St. Michael's Hospital, Toronto, Canada, [7]Sherbourne Health, Toronto, Canada, [8]Department of Medicine, University of Toronto, Toronto, Canada

Introduction: Data on HIV prevalence among transgender (trans) people are not routinely collected nor reported in national estimates, including in Canada. This lack of data may contribute to gender-based inequities in the HIV response. Our study sought to examine the HIV prevalence and associated factors among trans women engaged in clinical care in the two largest Canadian cities.

Methods: Retrospective data were collected from clinic charts of trans women aged 16+ across six family medicine and/or HIV clinics in Montreal and Toronto, Canada from 2018-2019. The prevalence of HIV was reported overall and then compared across sociodemographic and clinical subgroups followed by univariate and multivariable logistic regression.

Results: Among 1,059 patients, 7.5% were living with HIV, 54.4% were HIV negative, and 38.1% were missing HIV status data. Multivariable logistic regression analyses comparing those with HIV to those with HIV negative/unknown HIV status showed higher odds of HIV for those aged 50+ vs. <30 years (aOR: 2.52, 95% CI: 1.10, 5.81), Black race vs. white (aOR: 4.35, 95% CI: 1.41, 13.43), landed immigrant/permanent resident status vs. Canadian citizen (aOR: 5.76, 95% CI: 1.54, 21.42), receiving social assistance vs. not (aOR: 4.63, 95% CI: 1.43, 14.93), ever used recreational drug vs. never (aOR: 3.95, 95% 1.19, 13.06), and a history of hepatitis B vs. no history (aOR: 4.44, 95% CI: 1.12, 16.75), among trans women.

Implications: The prevalence of HIV in this cohort of trans women in clinical care was high at 7.5%, while lower than expected based on global estimates. Over one-third of patients did not have a documented HIV status. These findings highlight socioeconomic, psychosocial, and medical realities among trans women that may be associated with HIV or represent differential realities of trans women post HIV-diagnosis. Findings inform future HIV prevention programs and support opportunities for trans women in Canada.

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53 Uptake and Safety of SARS-CoV-2 Vaccine Protocols Among a Marginalized Urban Population of People Living with HIV

Hudson Reddon[1,2], Brittany Barker[2], Kora DeBeck[2,3], Kanna Hayashi[2,3], Inna Sekirov[1,4], Muhammad Morshed[1,4], Agatha Jassem[1,4], M. Eugenia Socias[1,2], Sofia Bartlett[4], M-J Milloy[1,2]
[1]University of British Columbia, Vancouver, Canada, [2]BC Centre on Substance Use, Vancouver, Canada, [3]Simon Fraser University, Vancouver, Canada, [4]BC Centre for Disease Control, Vancouver, Canada

Objectives: We undertook the present study to evaluate the uptake and adherence to SARS-CoV-2 vaccine protocols, and adverse events associated with vaccination among a marginalized urban population of people living with HIV who use unregulated drugs.

Methods: Study participants completed an interviewer-administered questionnaire between June-September 2021 in Vancouver, Canada. Multivariable logistic regression models were used to analyze the correlates of SARS-CoV-2 vaccine uptake and adverse events associated with vaccination.

Results: We enrolled 97 participants, of whom 56 (58%) reported receipt of two SARS-CoV-2 vaccine doses, 23 (24%) reported receipt of one dose and 17 (18%) reported being unvaccinated. Among those who had received two vaccine doses, the median time between doses was 67 days (interquartile range= 48-117 days). In the adjusted analysis of vaccine uptake, only female sex was significantly associated with receipt of both SARS-CoV-2 vaccine doses (female odds ratio (OR)=0.25, 95% confidence interval: 0.07-0.89, P=0.03). Of the 17 unvaccinated participants, 12 (71%; or 12% of the total sample) were undecided or opposed to vaccination. The most common reasons for vaccine hesitancy were concern about vaccine side effects and safety. A total of 30 (31%) participants reported at least one adverse event and there were no factors significantly associated with adverse events in the multivariable analysis (P>0.05). No serious adverse events were reported.

Discussion: We observed low rates of vaccine hesitancy and no serious adverse events among a marginalized urban population during the rollout of SARS-CoV-2 vaccine programs. With the exception of female sex, rates of vaccination and adverse events did not differ across sociodemographic, behavioural or clinical strata. These findings indicate that despite targeted vaccine services, vaccination rates among marginalized populations (58% double vaccinated) were below the Provincial rates (75%) at the time the data was collected.

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57 Preliminary Outcomes of a Low Barrier Hepatitis C virus (HCV) Testing and Linkage to Care Program Embedded within a Supervised Consumption Facility in Vancouver, BC

Shaughna Cooper[1], Kirti Singh[1], David Hall[1,2], Rolando Barrios[1], Marianne Harris[1,3], Julio Montaner[1,3], Kate Salters[1,4]
[1]BC Centre for Excellence in HIV/AIDS, Vancouver, Canada, [2]Vancouver Coastal Health, Vancouver, Canada, [3]University of British Columbia, Vancouver, Canada, [4]Simon Fraser University, Burnaby, Canada

Introduction: Disparities across the HCV cascade of care for people who use drugs (PWUD) highlight the necessity of patient-centered approaches to engage under-served clients. We provide preliminary results from an HCV testing and linkage to care intervention nested within a supervised consumption site (SCS) in Vancouver, BC.

Methods: The Hep C Connect study was launched in October 2021 to monitor progress across the HCV cascade of care amongst a prospective cohort of SCS clients with access to a pilot nurse-led HCV testing and linkage to care intervention. SCS clients who provide informed consent are offered an on-site, point-of-care HCV test. A survey is administered at once baseline and once at 3-6 months follow-up. Survey data collection includes demographic information, drug use history, recent health care utilization, and history of HCV testing and treatment. Standard of care (HCV RNA test and treatment) is available to participants who have a reactive HCV antibody test.

Results: As of November, 2021, 55 participants have been surveyed of whom 28 (50.9%) had a reactive HCV test. Of the 55 participants, 26 (47.2 %) were aged 35-49 years, 15 (27.2%) identified as cisgender women, 17 (30.9%) identified as Indigenous, 45 (81.8%) reported ever being incarcerated, and 34 (61.8%) reported homelessness in the previous 3 months. Nine participants (16.3%) had no existing connection to primary care and 32 (58.1%) indicated that their most recent or current healthcare provider has not discussed HCV with them in the previous 5 years; 13 (23%) reported never being tested for HCV or were unable to recall ever being tested.

Conclusion: Preliminary data suggest that our intervention is reaching under-served clients. Our evaluation will assess the efficacy of co-locating HCV testing and linkage to care within a service for PWUD in addressing treatment disparities and reaching patients at high risk of disengagement.

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60 Disruptions of Sexually Transmitted and Blood Borne Infections (STBBI) Testing Services During the COVID-19 Pandemic in Ontario: Service Providers' Experiences and Responses

Heeho Ryu[1], Ezra Blaque[1,2], Mackenzie Stewart[1], Praney Anand[3], Oralia Gómez-Ramirez[4,5,6], Kinnon MacKinnon[7], Catherine Worthington[8], Mark Gilbert[4,5], Daniel Grace[1]
[1]Dalla Lana School Of Public Health, University Of Toronto, Toronto, Canada, [2]Factor-Inwentash Faculty of Social Work, University of Toronto, Toronto, Canada, [3]Alliance for South Asian Aids Prevention, Toronto, Canada, [4]BC Centre for Disease Control, Vancouver, Canada, [5]School of Population and Public Health, University of British Columbia, Vancouver, Canada, [6]Canadian HIV Trials Network, Vancouver, Canada, [7]School of Social Work, York University, Toronto, Canada, [8]School of Public Health and Social Policy, University of Victoria, Victoria, Canada

Background: Since the COVID-19 pandemic in March 2020, availability of sexual health services including STBBI testing has been negatively impacted due to their designation as 'non-essential' health services. As a result, many individuals wanting to access sexual health care continued to have unmet sexual health needs throughout the pandemic. In response to this, sexual health service providers have adopted alternative models of care, such as virtual interventions and self-sampling/testing. The objective our analysis was to investigate service providers' experiences of disruptions to STBBI testing during the COVID-19 pandemic in Ontario and the acceptability of alternative models of care among service providers.

Methods: Between October 2020-February 2021, we conducted semi-structured virtual focus groups (3) and in-depth interviews (11) with a diverse group of sexual health service providers (n=18) including frontline workers, public health workers, sexual health nurses, physicians, and sexual health educators across Ontario. As part of a larger community-based research study, data collection and analysis were led by 3 Peer Researchers. Transcripts were transcribed verbatim and analysis techniques were used informed by grounded theory.

Results: Service providers identified the reallocation of public health resources and staff toward COVID-19 management, and the closures, reduced hours, and lower in-person capacities at sexual health clinics as the causes for a sharp decline in sexual health testing services. Virtual and self-sampling interventions for STBBI testing were adopted to increase service capacity while reducing the risk of COVID-19 transmission. Participants suggested that alternative models of testing were more convenient, accessible, safe, comfortable, cost-effective, and less workload heavy compared to traditional clinic-based models, and that they filled the gaps in testing caused by the pandemic.

Discussion: Acceptability of virtual and self-sampling interventions for STBBI testing was high among service providers, and their lived experiences of implementing such services demonstrated their feasibility in the context of Ontario.

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64 “If they had a place to live, they would be taking medication”: strategies for engaging street-connected young people in the HIV prevention-care continuum in Kenya

Lonnie Embleton[1], Juddy Wachira[2], Ruben Kiptui[3], Edith Apondi[3,4], David Ayuku[2], Paula Braitstein[1,4,5]

[1]Dalla Lana School Of Public Health University of Toronto, Toronto, Canada, [2]Moi University College of Health Sciences, Department of Behavioral Science, Eldoret, Kenya, [3]Academic Model Providing Access to Healthcare (AMPATH) , Eldoret, Kenya, [4]Moi Teaching and Referral Hospital, Eldoret, Kenya, [5]Moi University, College of Health Sciences, School of Medicine, Eldoret, Kenya

Background: Street-connected young people (SCY) experience structural and social barriers to engaging in the HIV prevention-care continuum. We sought to elicit recommendations for interventions that may improve SCY’s engagement along the HIV prevention-care continuum from healthcare providers, policymakers, community members, and SCY in Kenya.

Methods: This qualitative study was conducted across 5 counties in western Kenya between May 2017 and September 2018 to explore and describe the public perceptions of, and proposed and existing responses to, the phenomenon of SCY. We conducted 41 in-depth interviews (IDIs) and 7 focus group discussions (FGDs) with 100 participants, of which 43 were SCY. In total 48 participants were women and 52 men. This secondary analysis focuses on a subset of data interviews that investigated SCY’s healthcare needs.

Findings: Our analysis resulted in four major themes corresponding to stages in the HIV prevention-care continuum for key populations. We identified the need for an array of strategies to engage SCY in HIV prevention and testing services that are patient-centered and responsive to the diversity of their circumstances. The use of PrEP was a biomedical prevention strategy that SCY and healthcare providers alike stressed the need to raise awareness around and access to for SCY. Several healthcare providers suggested peer-based approaches for engaging SCY throughout the continuum. Though, SCY heavily debated the appropriateness of using peer-based methods. Structural interventions, such as the provision of food and housing, were suggested as strategies to improve ART adherence.

Conclusion: This study identified contextually relevant interventions that should be adapted and piloted for use with SCY to determine their feasibility and effectiveness for improving SCY’s engagement in the HIV prevention-care continuum. Notably, this work emphasises the importance of addressing structural factors that increase SCY’s risk of acquiring HIV and impede SCY’s ability to engage and re-engage in care.

66 Factors associated with sub-optimal HIV testing among gay, bisexual, and other men who have sex with men (GBM) at high risk for HIV living in Montreal, Vancouver and Toronto

Wes Megan Martin[1,2], Herak Apelian[1], Gilles Lambert[1,3], Milada Dvorakova[1], Alain Fourmigue[1], Nathan J. Lachowsky[4], David M. Moore[5], Trevor A. Hart[6,7], Daniel Grace[7], Jody Jollimore[8], Shayna Skakoon-Sparling[6], Allan Lal[5], Abbie Parlette[6], Jordan Sang[5], Syed Noor[6,9], Joseph Cox[1,2]
[1]Research Institute of the McGill University Health Centre, Montreal, Canada, [2]McGill University, Montreal, Canada, [3]Institut national de santé publique du Québec, Montreal, Canada, [4]University of Victoria, Victoria, Canada, [5]BC Centre for Excellence in HIV/AIDS, Vancouver, Canada, [6]X University (formely Ryerson), Toronto, Canada, [7]University of Toronto, Toronto, Canada, [8]Community-Based Research Centre, Vancouver, Canada, [9]Louisiana State University Shreveport, Shreveport, United States

Background: HIV testing is a key to effective HIV prevention. Provincial STBBI screening guidelines generally recommend GBM who regularly engage in high-risk behaviours to undergo HIV testing every 3-6 months. We investigated factors associated with not being tested for HIV in the past six months(P6M) among high-risk, self-reported HIV-negative/unknown status GBM.

Methods: The Engage Study recruited sexually active cisgender and transgender men ≥16 years via respondent-driven sampling (RDS) in Montreal(M), Toronto(T) and Vancouver(V). High-risk for HIV was defined as: HIRI-MSM score ≥10 or having ≥6 male partners(P6M). Using literature, expert knowledge, and a health-services model of access, we selected factors related to not getting tested for HIV(P6M). After considering correlation and missingness, associated factors were identified using city-specific regression models and Akaike information criteria (AIC) for model selection. Factors across the cities were compared. Results are RDS-adjusted.

Results: Among 2008 HIV-negative/unknown participants (M:968,T:418,V:622), 1491 were defined as high-risk for HIV(RDS-adjusted%: M:62%,T:55%,V:71%). Of these (median age:31, range:16-80), 534 were not tested for HIV in P6M (M:43%,T:35%,V:36%). Not having a primary healthcare provider (HCP) had a significant or trending association with not testing in all cities (M:OR:2.2:95%CI:1.3-3.9, T:2.5:0.98-6.4, V:3.5:1.6-8.3). Furthermore, receiving sexual health information from a healthcare professional in P6M was associated with testing in all cities (M:OR:0.13:95%CI:0.1-0.22, T:0.10:0.03-0.26, V:0.06:0.02-0.12). Not identifying as gay was associated with not testing in Toronto (OR:3.3:95%CI:1.1-10) and Vancouver (OR:4.5:95%CI:1.5-13.7) but was associated with testing in Montreal (OR:0.52:95%CI:0.27-0.99). Not being out to HCP was associated with not testing in Montreal (OR:4.1:95%CI:1.8-9.4) and Toronto (OR:4.5:95%CI:1.2-18.3), but was not significant in Vancouver (OR:0.96:95%CI:0.37-2.47).

Conclusion: Over a third of high-risk GBM across cities were not HIV tested(P6M). Providing GBM, regardless of sexual orientation, with access to non-judgemental HCPs who evaluate risk and recommend STBBI screening accordingly, appears important for achieving recommended HIV screening.

79 Confirming Self-Reported Data about Chronic/Latent Viral Infections and Key HIV-related Health Parameters in Cohort Studies: the British Columbia CARMA-CHIWOS Collaboration (BCC3) Study Experience

Tetiana Povshedna[1,2], Shayda A Swann[3,4], Amber R Campbell[3,5], Sofia LA Levy[3,5], Melanie Lee[6], Elizabeth M King[3,7], Valerie Nicholson[6,8], Angela Kaida[3,6], Melanie CM Murray[3,5,9], Hélène CF Côté[1,2,3], on behalf of the BCC3 (CIHR, CTN 335) study team

[1]Department of Pathology and Laboratory Medicine, University of British Columbia, Vancouver, Canada, Centre for Blood Research, University of British Columbia, Vancouver, BC, Canada, [3]Women's Health Research Institute, British Columbia Women's Hospital and Health Centre, Vancouver, British Columbia, Canada, [4]Experimental Medicine, The University of British Columbia Faculty of Medicine, Vancouver, British Columbia, Canada, [5]Oak Tree Clinic, British Columbia Women's Hospital and Health Centre, Vancouver, British Columbia, Canada, [6]Faculty of Health Sciences, Simon Fraser University, Burnaby, British Columbia, Canada, [7]Department of Medicine, Faculty of Medicine, The University of British Columbia, Vancouver, British Columbia, Canada , [8]Epidemiology and Population Health, BC Centre for Excellence in HIV/AIDS, Vancouver, British Columbia, Canada , [9]Division of Infectious Diseases, The University of British Columbia Faculty of Medicine, Vancouver, British Columbia, Canada.

Background: Cohort studies, especially community-based, rely on self-reported data about chronic/latent viral infections and HIV health parameters. There are limited data describing how self-reported information reflects those obtained from clinical chart review or laboratory testing. This interim analysis of the BCC3 cohort data aimed to confirm important self-reported variables to inform ours and other cohort studies in the field of HIV research.

Methods: Self-reported HIV-related parameters (CD4 counts, viral load) and chronic/latent viral infection history were obtained as a part of the BCC3 clinical survey and compared to data obtained by chart review and serological testing. The latter included anti-hepatitis B (HBV) virus core antibody, anti-hepatitis C virus (HCV), and anti-herpes simplex virus types 1 (HSV-1), 2 (HSV-2) antibodies. Self-reported and serology-based prevalence were compared using Chi-Squared or Fisher's Exact test, as appropriate.

Results: Self-reported and serology-based prevalence of HBV, HCV, HSV-1, and HSV-2 are summarized in Table 1. Chart review data were compared with self-report among women who could remember/estimate their CD4 nadir (66/85), recent CD4 count (61/88), and recent viral load (84/88) (Table 1).

Conclusions: Self-reported and serological prevalence did not differ for HBV and HCV. However, for HSV-1 and HSV-2, both groups were less aware of having been exposed to the virus. While a high proportion of WLWH were aware of HIV-related heath parameters, our finding that 11% of WLWH were unaware that they recently had a detectable (>40c/ml) viral load emphasizes the importance of clearly communicating this information to WLWH, to best inform their care and actions.

Supporting Document

Table 1. Self-reported vs confirmed data about chronic/latent viral infection prevalence and HIV-related health parameters.	**WLWH (n=81)**	**HIV-negative control women (n=69)**
Hepatitis B natural infection		
Prevalence based on self-report, n (%)	11 (14)	2 (3)
Prevalence based on serological testing, n (%)	16 (20)	3 (4)
Self-reported prevalence vs serological, p-value	0.3	0.99
Hepatitis C natural infection (active or past infection)		
Prevalence based on self-report, n (%)	27 (33)	5 (7)
Prevalence based on serological testing, n (%)	26 (32)	6 (9)
Self-reported prevalence vs serological, p-value	0.9	0.99
Herpes simplex virus type 1		
Prevalence based on self-report, n (%)	29 (36)	22 (32)
Prevalence based on serological testing, n (%)	59 (73)	42 (61)
Self-reported prevalence vs serological, p-value	**<0.0001**	**0.0006**
Herpes simplex virus type 2		
Prevalence based on self-report, n (%)	14 (17)	10 (14)
Prevalence based on serological testing, n (%)	58 (72)	21 (30)
Self-reported prevalence vs serological, p-value	**<0.0001**	**0.02**
HIV-specific health parameters, n (%)	**WLWH**	
Self-reported CD4 nadir confirmed by chart review[1]	52/66 (79)	
Self-reported recent CD4 count confirmed by chart review[2]	48/61 (79)	
Self-reported undetectable (n=74/84) not confirmed by chart review[3]	8/74 (11)	

[1]CD4 counts from self-report and chart review (when available) were compared based on WHO HIV CD4-based staging.
[2]The term "recent" refers to the most recent test result before the study visit. [3]5/8 had VL <200 copies/ml

88 Trends in Hospitalization by Sex among People Living with HIV from 2006 to 2020 in the Canadian Healthcare Use Study (CHESS)

Alison R McClean[1,2], Huimin Lu[1], Monica Ye[1], Carly Marshall[1], Jason Trigg[1], Taylor McLinden[1], Katherine W Kooij[1,3], Robert S Hogg[1,3]
[1]BC Centre for Excellence in HIV/AIDS, Vancouver, Canada, [2]University of British Columbia, Vancouver, Canada, [3]Simon Fraser University, Burnaby, Canada

Background: Several studies have described higher hospitalization rates among females compared to males living with HIV. Our study characterizes trends in hospitalizations by sex among people living with HIV (PLWH) across Canada.

Methods: We used data from the Canadian Healthcare Use Study (CHESS) which contains longitudinal administrative data for PLWH hospitalized in an acute care facility in Canada from April 2006 to March 2020. PLWH were included if they were >19 years old on or after 1 April 2006 and had at least one hospitalization in the Discharge Abstract Database (DAD) containing an ICD-10-CA diagnosis code indicative of HIV (B24, O98.7, R75, Z21). For each hospitalization, the most responsible diagnosis (MRD) was tabulated and stratified by sex and jurisdiction of residence. Hospitalizations with a pregnancy or pregnancy-related condition as the MRD were excluded.

Results: Our study included 27,420 PLWH with at least one hospitalization containing an HIV-related ICD-10-CA code—of which 21,250 (77.5%) were male and 6149 (22.4%) were female—from all Canadian provinces and territories. Included females were younger than males (median 42 versus 48 years, respectively) and females (3096, 50.3%) were more often from the lowest neighbourhood income quintile compared to males (8437, 39.7%). There was a total of 123,901 hospitalizations contributed throughout the study period, of which 30.0% and 69.9% were among females and males, respectively. For both sexes, roughly 1 in 5 hospitalizations contained ‘Certain infectious and parasitic diseases’ as the MRD while 11.7% and 11.0% of hospitalizations were reportedly due to ‘Mental and behavioural disorders’ and ‘Diseases of the respiratory system’, respectively.

Conclusions: Between 2006 and 2020, females were more likely to be hospitalized than males among PLWH with at least one hospitalization containing an HIV-related diagnosis code. Excluding pregnancy-related conditions, the top three MRDs for acute care hospitalizations were the same for both sexes.

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92 A New HIV-specific Health-Related Quality of Life Index to Measure Outcomes and Propensity to Adopt Interventions

Kedar K. V. Mate[1,2,3,6], Nancy E Mayo[2,4,6], Marie-Josee Brouillette[6], Lesley Fellows[5], Bertrand Lebouche[1,2,3,6]

[1]Family Medicine, Montreal, Canada, [2]Centre for Outcomes Research and Evaluation, McGill University Health Centre Research Institute, Montreal, Canada, [3]Chronic and Viral Illness Service, Division of Infectious Disease, McGill University, Montreal, Canada, [4]School of Physical and Occupational Therapy, Divisions of Clinical Epidemiology, Geriatrics, Experimental Medicine, Department of Medicine, Montreal, Canada, [5]Department of Neurology and Neurosurgery, Montreal Neurological Institute, McGill University, Montreal, Canada, [6]McGill University Health Centre Research Institute, Montreal, Canada

Aims: Increasingly, HRQL measures that produce one value across multiple dimensions are being developed. The preferences patients have for each health state are then used to weight the dimensions so that one value is produced. The aim of this project was to develop a short, HIV-specific, HRQL measure with a scoring system based on patient preferences for the different dimensions, the Preference Based HIV index (PB-HIV).

Methods: The data from the Canadian Positive Brain Health Now (BHN) cohort (n=854 participants with HIV; mean age 53 years) that used the Wilson-Cleary model for the measurement framework included both standard format and individualized measures. The latter identified the important areas of life that are affected by HIV and items from the standard format measures were mapped to these areas and formed the domains. Rasch analysis was used to identify the best performing item to represent each dimension. To develop a prototype scoring system, each dimension was then regressed on self-rated health (scored 0 to 100) and the regression parameters were used as weights. To customize the dimensions, cognitive debriefing and simultaneous translation in English and French was conducted with patients and healthcare professionals.

Results: Seven independent (item-to-item correlations. 0.16 to 0.55) dimensions with three declarative statements ordered as response options, formed the PB-HIV Index (pain, fatigue, memory/concentration, sleep, body image, depression, motivation). Regression parameters from a multivariable model yielded a measure with a scoring range from 0 (worst health) to 100 (perfect health). Table 1 shows, for BHN participants, values for the PB-HIV Index, for measures of convergent domains as well as inter-measure correlations.

Conclusions: Preference-based measures are optimal when cost- or comparative-effectiveness is of importance as the total score reflects gains in some dimensions balanced against losses in others. PB-HIV index is the first HIV specific preference-based measure.

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110 Enhancing access to services for gbMSM: A decision-making guide to self-assess access to health services for gbMSM, based on a Community-Based Participatory Research

Marie Latendresse[1], Joanne Otis[1], Jessica Caruso[1], Gabriel Daunais-Laurin[2], Ken Monteith[3]
[1]Université du Québec à Montréal, Montréal, Canada, [2]RÉZO, Montréal, Canada, [3]COCQ-SIDA, Montréal, Canada

Background: A decision-making guide has been developed and validated to help organizations monitor access to their services for gbMSM, make informed decisions and establish an action plan accordingly. The approach is based on a framework by Lévesque, Harris and Russell (2013), characterizing access to services using 5 dimensions (approachability, acceptability, availability and accommodation, affordability and appropriateness) targeting changes on the intra and interorganizational level (service providers).

Methods: Between 2016 and 2021, a four-step process has led to the development and validation of a monitoring tool for service providers to assess access to their services for gbMSM: 1) an environmental scan using an ethnographic approach with more than 400 health services offered to gbMSM (screening, sexual health, PEP, PrEP, mental health, etc.), 2) 22 focus groups with gbMSM and service providers, 3) an online questionnaire filled out by key informants and community members using the Delphi method (n=66), and 4) support in the deployment of the tool in some pilot organizations.

Description of the intervention: The decision-making guide regarding access to health services is divided in 4 modules: 1) presentation of the context surrounding the production of the guide, and its application, 2) methodology for implementing an environmental scan to map the services in a given region and their accessibility for gbMSM, 3) a monitoring tool allowing service providers to self-assess access to their services on the five dimensions of access to services, using indicators and criteria, 4) knowledge transfer methods to present the results obtained and to promote the involvement of organizations in a knowledge application process.

Conclusion: The guide and monitoring tool allows organizations to review the strategies put in place to optimize access to their services and to ensure that they are approachable, acceptable, available and accommodating, affordable and appropriate for gbMSM.

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117 Study Protocol of the COVID-HIV Evaluation of Serology and Health Services (CHESS) Study

Cassandra Freitas[1,2], Hoda Hassan[2], Catharine Chambers[1,2], Curtis Cooper[3], Abigail Kroch[4], Marc-André Langlois[3], Muluba Habanyama[5], Devan Nambiar[6], Ann N. Burchell[1,2], on behalf of the CHESS Study Team

[1]University of Toronto, Toronto, Canada, [2]Unity Health Toronto, Toronto, Canada, [3]University of Ottawa, Ottawa, Canada, [4]Ontario HIV Treatment Network, Toronto, Canada, [5]The Teresa Group, Toronto, Canada, [6]Gay Men's Sexual Health Alliance, Toronto, Canada

Background: There are concerns that people living with HIV may experience more adverse impacts from circulating SARS-CoV-2 and pandemic restrictions on health care. Here, we describe the design of the CHESS Study that will assess the burden of COVID-19 among people living with HIV in Ontario.

Aims: 1) to estimate SARS-CoV-2 sero-prevalence among people living with HIV; and 2) using administrative health data linkages, (i) to measure rates of and identify risk factors for COVID-19 testing, diagnosis and COVID-19-related outcomes compared to HIV-negative individuals; (ii) to estimate vaccine effectiveness against laboratory-confirmed infection with SARS-CoV-2; and (iii) to assess the impact of the pandemic on HIV care engagement.

Methods: Aim 1: We are conducting a sero-epidemiological investigation among active participants of the Ontario HIV Treatment Network Cohort Study (OCS), an established clinical cohort. Up to 1,000 participants will self-collect a one-time dried blood spot sample using at-home collection kits for SARS-CoV-2 serology as well as complete a brief COVID-19 questionnaire at the time of self-collection. Questions include: COVID-19 symptoms, testing, diagnosis, and vaccine history. Aim 2: The second aim will be addressed using provincial health administrative databases at ICES. All OCS participants have consented to linkage of their data at ICES. Analyses will be conducted using three cohorts: the linked OCS cohort; a validated, ICES-derived HIV cohort, representing all people living with HIV in Ontario who access health services; and a matched cohort of HIV-negative individuals. We will ascertain COVID-19-related outcomes (vaccine uptake, testing, hospitalization, mortality) and changes in health service utilization including HIV care engagement prior to and during the pandemic.

Implications: Results will provide reliable, efficient, and comprehensive information on the burden of COVID-19 among people living with HIV in Ontario. Findings will fill a knowledge gap in immunocompromised populations that can inform immunization and clinical guidelines.

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120 The Intersection of two Pandemics : Evaluation of HIV routine viral load testing during the COVID-19 pandemic in Montréal, Québec

Leïla Leclerc[1,2], Jean-Emmanuel Exantus[2], Marios Fokaefs[5], Madeleine Durand[2,4], Simon de Montigny[1,3], Benoît Trottier[2]
[1]École de santé publique de l'Université de Montréal, Montréal, Canada, [2]Clinique médecine urbane du Quartier Latin, Montréal, Canada, [3]Centre de recherche du CHU Sainte-Justine, Montréal, Canada, [4]Centre de recherche du CHUM, Montréal, Canada, [5]École polytechnique de Montréal, Montréal, Canada

Context: Routine viral load testing is essential to attain the 90-90-90 targets aimed to eliminate HIV. Public health measures precipitated by the COVID-19 pandemic have posed a threat to the continuum of care for people living with HIV (PLWHIV). The goal of this project is to describe the evolution of the rate of viral load (VL) tests before and during the COVID-19 pandemic.

Design: A single-armed cohort study was conducted. Patients in an open cohort were followed through pre-pandemic (before) and per-pandemic (during) periods at the Clinique Médecine Urbaine du Quartier Latin (Montréal, Québec).

Methods: Observed incidence rates of VL tests were computed in the pre-pandemic and per-pandemic periods. 95% confidence intervals and covariate-adjusted linear regression were used to compare the incidence rates for these periods.

Results: 1712 patients were included in the study. The mean rate of VL testing was 2.35 tests per person-years (PY) during the pre-pandemic period (CI : 2.30 – 2.42) and 1.35 tests per PY during the per-pandemic period (CI : 1.30 – 1.40); resulting in a rate difference of 1.04 tests per PY (CI: 0.93 – 1.08). The adjusted rate difference in linear regression was 0.96 tests per PY (CI: 0.83 – 1.01, $p < 0.001$). Men that have sex with men and patients with a detectable VL had higher rates of VL tests than their counterparts ($p < 0.001$). Intravenous drug users, patients following ART treatment and treatment-naïve patients had lower rates ($p < 0.001$). No significant differences were observed amongst sexes, age, duration of HIV and CD4 count at cohort entry.

Conclusions: A reduction of VL test rates supports existing qualitative literature suggesting the COVID-19 pandemic has hindered vital aspects of the HIV care continuum. Further measures need to be implemented to minimize the disruption of HIV care during public health crises.

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123 A Person-Centred Approach to Exploring Human Papillomavirus (HPV) Vaccination Among Gay, Bisexual, and Other Men Who Have Sex With Men (GBM): A Canadian Immunization Research Network Study

Ramandip Grewal[1,2], Shelley Deeks[2,3], Trevor A Hart[2,4], Joseph Cox[5,8], Alexandra De Pokomandy[5], Troy Grennan[6,7], Gilles Lambert[8], David Moore[7,9], Francois Coutlée[11,12], Mark Gaspar[2], Clemon George[13], Jennifer Gillis[7], Daniel Grace[2], Jody Jollimore[14], Nathan J Lachowsky[9,14,15], Rosane Nisenbaum[1,2], Gina Ogilvie[6,7], Chantal Sauvageau[10,16], Darrell HS Tan[1,2], Anna Yeung[1], Ann N Burchell[1,2]

[1]Unity Health Toronto, Toronto, Canada, [2]University of Toronto, Toronto, Canada, [3]Nova Scotia Department of Health and Wellness, Halifax, Canada, [4]Ryerson University, Toronto, Canada, [5]McGill University, Montreal, Canada, [6]BC Centre for Disease Control, Vancouver, Canada, [7]University of British Columbia, Vancouver, Canada, [8]Direction régionale de santé publique – Montréal, Montreal, Canada, [9]BC Centre for Excellence in HIV/AIDS, Vancouver, Canada, [10]Université Laval, Quebec City, Canada, [11]Centre de recherche du Centre hospitalier de l'Université de Montréal, Montreal, Canada, [12]Université de Montréal, Montreal, Canada, [13]University of Southern Maine, Portland, USA, [14]Community-Based Research Centre, Vancouver, Canada, [15]University of Victoria, Victoria, Canada, [16]Institut national de santé publique du Québec, Montreal, Canada

Introduction: Some provinces and territories offer publicly-funded HPV vaccine to GBM and/or people living with HIV ≤26 years old. We explored how social and programmatic determinants of vaccine hesitancy intersect among GBM and influence stage of HPV vaccine uptake (Stages: 1=HPV vaccine unaware; 2=undecided/unwilling to get vaccinated; 3=willing; 4=vaccinated [1+ dose]).

Methods: Engage is a community-recruited study of GBM in Vancouver, Toronto, and Montreal. Latent class analyses were conducted by city to create subgroups of GBM 16-26 years old (N Vancouver=178; Toronto=123; Montreal=249) according to immigration, financial strain, ethnicity/race, sexual orientation non-disclosure, education, hepatitis A/B vaccination, and healthcare provider access. Next, by latent class, we predicted the probability of being in and association with vaccination stage using the Bolck, Croon, and Hagenaars approach.

Results: Three percent of men were living with HIV and 19% of HIV-negative men tried to access or were on pre-exposure prophylaxis (PrEP). Class membership was associated with vaccination stage in Vancouver (p=0.003) and Montreal (p=0.048) but not Toronto (p=0.642; data not shown). The ‘no vaccine hesitancy determinants’ classes had the highest probability of being vaccinated (Table 1). In Vancouver, the ‘ethnoracial/immigration/non-disclosure/low healthcare access’ class had the highest probability of being vaccine unaware. In Montreal, the ‘immigration/low hepatitis A or B vaccination’ and ‘non-disclosure/financial strain/low healthcare access/less education’ classes had the highest probabilities of being vaccine unaware and undecided/unwilling.

Conclusion: GBM unaware of or undecided/unwilling to receive HPV vaccine shared common but differing combinations of vaccine hesitancy determinants by city. Tailored interventions for subgroups across cities are needed.

Supporting Document

Table 1: Probability of being in each stage of HPV vaccine uptake by latent class group membership (labeled based on the determinants with the highest item-response probabilities in each group) among men 16-26 years old in Vancouver and Montreal

Latent classes by city	**Probability of being in each stage of HPV vaccine uptake**			
Vancouver	**Stage 1:** Vaccine unaware	**Stage 2:** Undecided/unwilling to get vaccinated	**Stage 3:** Willing to get vaccinated	**Stage 4:** Vaccinated (1+ dose)
Ethnoracial, immigration, non-disclosure, and low healthcare access determinants	75%	8%	5%	12%
Financial strain and less education determinants	17%	43%	16%	24%
Ethnoracial determinants	18%	7%	30%	45%
No vaccine hesitancy determinants	10%	14%	20%	56%
Montreal	**Stage 1:** Vaccine unaware	**Stage 2:** Undecided/unwilling to get vaccinated	**Stage 3:** Willing to get vaccinated	**Stage 4:** Vaccinated (1+ dose)
Immigration and low hepatitis A or B vaccination determinants	43%	40%	9%	8%
Non-disclosure, financial strain, low healthcare access, and less education determinants	46%	25%	15%	14%
Ethnoracial, immigration, and non-disclosure determinants	22%	9%	30%	39%
No vaccine hesitancy determinants	10%	8%	24%	58%

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125 Social support and economic security during the COVID-19 pandemic among women living with HIV in Metro Vancouver, Canada: A mixed-methods study

Mika Ohtsuka[1,2], Kathleen Deering[1,2], Kate Shannon[1,2], Prerna Thaker[1,2], Candice Norris[2], Desire King[2], Melissa Braschel[2], Akanee Yamaki[2], Andrea Krüsi[1,2]
[1]University of British Columbia, Vancouver, Canada, [2]Centre for Gender and Sexual Health Equity, Vancouver, Canada

Objective: Women living with HIV (WLWH) face ongoing structural marginalization and current evidence outlines how COVID-19 has exacerbated health and social inequities among key populations. This mixed methods study investigated how the COVID-19 pandemic and associated public health responses shaped social support and economic security among WLWH.

Methods: We drew on a COVID-19-specific quantitative survey with 166 cis and trans WLWH (April 2020-August 2021) as part of SHAWNA, an open longitudinal community-based research project with WLWH in Metro Vancouver. Additionally, we conducted 28 semi-structured interviews with a subset of WLWH in SHAWNA (May 2020-July 2020). Drawing on a socio-ecological framework, we sought to characterize how COVID-19 and related public health responses shaped social support and economic security.

Results: Among 166 respondents, 6.0% identified as trans, 53.0% were Indigenous, 35.5% were White and 10.2% were Black and/or otherwise racialized. Overall, 38.6% reported increased social isolation and 57.8% reported increased difficulty maintaining social networks since COVID-19 began. Over one-quarter of participants (26.5%) reported negative changes to their economic situation despite a temporary increase in BC's income and disability assistance, and 61.5% reported negative changes to food security since COVID-19 began. In qualitative interviews, participants described how food access was shaped by financial barriers and loss of programs. Participants highlighted precarity in many types of informal work, including peer-based work during COVID-19. In addition to loss of income and employment opportunities due to the pandemic, many participants' narratives reflected uncertainty around eligibility and potential retaliation for accessing COVID-19 government financial supports.

Conclusion: Our findings highlight heightened experiences of social isolation and economic insecurity during the COVID-19 pandemic among WLWH. Structural responses that can facilitate social support and respond to lost income, program closures, employment opportunities, and economic security, with a focus on culturally-safe Indigenous-led responses, remain critical to supporting women's health and well-being.

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131 Pre-HIV-diagnosis utilization of HIV prevention modalities by people living with HIV in Ontario

Sean Colyer[1], Kristen O'Brien[1], Patrick O'Byrne[2], Garfield Durrant[3], Ken English[4], Vanessa Tran[5,6], Alex Munsten[1], Randy Davis[7], Abigail E Kroch[1,5,8]

[1]Ontario HIV Treatment Network, Toronto, Canada, [2]University of Ottawa, Ottawa, Canada, [3]Black Coalition for AIDS Prevention, Toronto, Canada, [4]AIDS and HepC Programs, Ontario Ministry of Health, Toronto, Canada, [5]Public Health Ontario, Toronto, Canada, [6]Department of Laboratory Medicine and Pathobiology, University of Toronto, Toronto, Canada, [7]The Gilbert Centre, Barrie, Canada, [8]Dalla Lana School of Public Health, University of Toronto, Toronto, Canada

Background: Timely HIV testing and initiation of antiretroviral therapy are major determinants in achieving optimal health for people living with HIV and preventing ongoing transmission. We examined self-reported history of HIV testing and use of prevention modalities among a population of people living with HIV (PLWH) in Ontario to identify missed opportunities for prevention and diagnosis.

Methods: Results are from analysis of the 2020 annual questionnaire of the Ontario HIV Treatment Network (OHTN) Cohort Study (OCS), a longstanding prospective biobehavioural (clinical and questionnaire data) longitudinal study of >8000 PLWH across 15 clinical sites in Ontario.

Results: Description of the sample and history of HIV test prior to HIV diagnosis are shown in table 1. 42.7% (n=173/405) of participants reported experiencing symptoms at diagnosis indicative most likely of chronic HIV infection. Of the 86 participants who completed our baseline survey in 2020, 9.3% (n=8) were diagnosed through anonymous testing. Post-exposure prophylaxis (PEP) was first available in Ontario in 2006; 9 of the 595 participants (1.5%) diagnosed in Ontario after 2005 had used PEP prior to their HIV diagnosis. Pre-exposure prophylaxis (PrEP) was approved in Ontario in 2016; fewer than 5 of the 148 participants diagnosed in Ontario after 2015 had used pre-exposure prophylaxis (PrEP) prior to their HIV diagnosis.

Conclusions: Results suggest differential uptake of HIV testing, and potential testing barriers. Biomedical prevention modalities are in use in Ontario and small counts of OCS participants are reporting having used them, possibly indicative of successful retention of PrEP users.

Supporting Document

Table 1.

	Descriptive statistics of main sample n (%)	Had an HIV test prior to HIV diagnosis n (%)
Sex (N=410)		
Males	328 (80.0%)	235 (47.6%)
Females	82 (20.0%)	39 (71.6%)
Age (N=407)		
<50 years	280 (68.8%)	198 (70.7%)
50+ years	127 (31.2%)	75 (59.1%)
Race/ethnicity (N=409)		
White	220 (53.8%)	149 (67.7%)
Black	95 (23.2%)	58 (61.0%)
Other/mixed/unknown	94 (23.0%)	66 (70.2%)

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134 The importance of hepatitis B prevention intervention during HIV PEP visits and the inefficacy of hepatitis B immune globulin: A retrospective chart review

Danae Penichet[1,5], Lotus Alphonsus[2,5], Sarmud Mahmood[3,5], Oscar Pico-Espinosa[4,5], Darrell H. S. Tan[4,5,6]

[1]Department of Human Biology, University of Toronto, Toronto, Canada, [2]Schulich School of Medicine and Dentistry, Western University, London, Canada, [3]Faculty of Health Sciences, Queen's University, Kingston, Canada, [4]Centre for Urban Health Solutions, St. Michael's Hospital, Toronto, Canada, [5]Unity Health, Toronto, Canada, [6]Department of Medicine, University of Toronto, Toronto, Canada

Background: Hepatitis B (HBV) disproportionately affects people at risk of HIV and active vaccination is the standard of care for prevention. We quantified susceptibility to HBV among HIV post-exposure prophylaxis (PEP) seekers and estimated the number needed to prevent (NNP) HBV in this setting using Hepatitis B immune globulin (HBIG).

Methods: Data are from an ongoing retrospective chart review of patients requesting PEP from 2001-2021. We classified patients as HBV infected, immune, or susceptible, stratified by exposure type (sexual vs. parenteral). We defined HBV infection as a self-report of chronic HBV or reactive HBsAg, and HBV susceptibility as HBsAb<10IU/mL (plus non-reactive HBcAb, if available). For HBV susceptibles, we determined how often HBV vaccine and HBIG were administered. We calculated the HBIG NNP based on published estimates of HBIG and vaccine efficacy, per-sex act risk of HBV transmission, and HBV prevalence, assuming susceptible patients routinely receive HBV vaccine.

Results: Among 370 HIV PEP episodes (among 277 unique patients reviewed to date), 298(83.9%) and 57(16.1%) were for sexual and parenteral exposures, respectively. Mean age was 34.5(SD=10.8), and most were men who have sex with men (MSM) (74.6%). Among those with sexual exposures, 84(28.2%) were HBV-susceptible and 4(1.3%) were HBV positive at baseline. Among parenteral exposures, 20(35.1%) were HBV-susceptible and 1(1.7%) were HBV positive. Most (66.5%) patients were HBV immune; two sexually exposed patients had acute HBV. Thirty-nine (35.8%) susceptible patients received HBV vaccine and 16(14.7%) received HBIG, although no source patients were known to be HBV positive. Most (95.7%) PEP regimens were HBV-active (contained tenofovir/emtricitabine). We estimated that HBIG NNP=40928 among MSM (range, 9640-218833). For a known HBV-positive source, NNP=733 (200-3282).

Conclusion: A third of HIV PEP seekers were HBV susceptible, suggesting that PEP visits are important opportunities for HBV prevention interventions. The high estimated NNP suggests that HBIG is not efficient.

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135 Drug Resistance and Phylogenetic Clustering Among Previous Pre-Exposure Prophylaxis Users Who Seroconverted

Angela McLaughlin[1,2], Junine Toy[1], Vincent Montoya[1], Paul Sereda[1], Jason Trigg[1], Amanda Granados[1], Sakshi Khanna[1], Chanson Brumme[1,3], Rolando Barrios[1], Julio Montaner[1,3], Jeffrey Joy[1,2,3]

[1]British Columbia Centre for Excellence in HIV/AIDS, Vancouver, Canada, [2]Bioinformatics, University of British Columbia, Vancouver, Canada, [3]Department of Medicine, University of British Columbia, Vancouver, Canada

Pre-exposure prophylaxis (PrEP) has been available in British Columbia (BC) since January 2018 at no cost to clients. We tested whether phylogenetic clustering and drug resistance differed between previous PrEP users who seroconverted (PUWS) compared to non-PrEP users who seroconverted (NPUWS). Phylogenetic trees were inferred from 38,539 HIV pol sequences from 10386 Drug Treatment Program participants.

Drug resistance mutations and scores (sum of mutation penalty scores by drug) were called using the Stanford HIVdb algorithm on pre-ART baseline sequences. Clusters comprised 5 or more members with pairwise patristic distances less than 0.02 substitutions/site. Date of first detectable viral load was used as proxy for diagnosis.

From 1 January 2018, 7465 persons had ever received PrEP via the BC program, of whom 15 (0.20%) had seroconverted by 24 June 2021 (diagnosis range: 23 October 2018 - 20 November 2020). Over this diagnosis range, there were 314 NPUWS. PUWS were not significantly more likely to cluster than NPUWS (61.5% vs. 43.7%, chi-square p=0.26). All five unique clusters joined by PUWS were also joined by NPUWS.

Although there was no difference between the proportions of PUWS or NPUWS with any baseline resistance mutation (0.27 vs. 0.20, chi-square p=0.67), PUWS had significantly higher baseline resistance scores to emtricitabine and lamivudine than NPUWS (mean 4.33 vs. 0.51, Kruskal p=0.002). This trend was driven by a single PUWS carrying M184V (p=0.136 when removed) who had 229 days between last HIV test and diagnosis, yet 64 days between last prescription and diagnosis (median 200), as well as the lowest proportion of days covered by PrEP (0.6 vs. median 0.94), suggesting potential PrEP exposure during acute infection. M184V was absent among phylogenetic neighbours, suggesting it was acquired or selected from a minority variant. The multitudinous benefits of PrEP could be ameliorated by supporting adherence and proper monitoring.

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138 The cascade of care for hepatitis C virus among gay, bisexual and other men who have sex with men in Vancouver, Toronto and Montreal

David Moore[1], Lu Wang[1], Jordan Sang[1], Shayna Skakoon-Sparling[3], Justin Barath[1], Nathan Lachowsky[4], Trevor Hart[3,5], Gilles Lambert[7,8], Mark Hull[1,2], Darrel Tan[5], Daniel Grace[5], Jody Jollimore[9], Herak Apelian[7], Allan Lal[1], Abbie Parlette[3], Joseph Cox[6,7]
[1]Bc Centre For Excellence In HIV/AIDS, Vancouver, Canada, [2]University of British Columbia, Vancouver, Canada, [3]Ryerson University, Toronto, Canada, [4]University of Victoria, Victoria, Canada, [5]University of Toronto, Toronto, Canada, [6]McGill University , Montreal, Canada, [7]7.Research Institute of the McGill University Health Centre, Montreal, Canada, [8]Institut national de santé publique du Québec, Montréal, , Canada, [9]Community Based Research Centre, Vancouver, Canada

Introduction: Gay, bisexual and other men who have sex with men (GBM) are a priority population for microelimination of hepatitis C virus (HCV). We estimated HCV care cascade indicators and correlates of detectable HCV RNA among GBM recruited in Montreal, Toronto and Vancouver.

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 and tests for HIV, HCV, and other sexually transmitted infections. We conducted bivariate analyses comparing the RDS-II adjusted proportions for indicators across cities. Using pooled three-city data, we used RDS II weighted logistic regression to examine associations with detectable HCV RNA among HCV- positive participants.

Results: We recruited 1179 participants in Montreal, 517 in Toronto, and 753 in Vancouver. HCV seroprevalence was 6.8% in Montreal, 3.8% in Toronto, and 5.9% in Vancouver (p=0.006). Among HCV-seropositive participants, 3.1%, 1.1% and 2.3% were unaware of their status, in Montreal, Toronto, and Vancouver, respectively. In Montreal, 65% of HCV-positive participants reported receiving HCV treatment and 38% had detectable HCV RNA; in Toronto, 93% reported receiving treatment and 7% had detectable HCV RNA; in Vancouver, 89% reported receiving treatment and 11% had detectable HCV RNA (p=0.372 for treatment and p=0.039 for detectable RNA). Multivariable modelling found no differences in detectable HCV RNA by city; adjusted odds ratio [AOR] for Vancouver= 0.26 (95% CI 0.05-1.46); AOR for Toronto=0.19 (95% CI 0.01-3.54) compared to Montreal. Age (AOR 0.90 per year increase; 95% CI 0.84 - 0.97) and recent injection drug use (AOR = 8.39; 95% CI 2.11-33.4) were associated with detectable HCV RNA.

Conclusion: Among GBM in these three cities, we found very low proportions of undiagnosed HCV but gaps remain in treatment uptake. Additional interventions may be required to better engage younger GBM and those using injection drugs.

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139 Heating Hydros – Public Health Efforts Reducing Infections Among Injection Drug Users

Meera Shah[1,2], Christine Brignall[3], Sheila Densham[3], Sameena Vadivelu[3], Shaya Dinsa[3], Michael Silverman[2,4]
[1]McMaster University, Hamilton, Canada, [2]Schulich School of Medicine, Western University, London, Canada [3]Middlesex-London Health Unit, London , Canada , [4]Division of Infectious Diseases, St. Joseph's Health Care, London Health Sciences Centre, London , Canada

Objectives: Studying the recent HIV crisis and increased infective endocarditis (IE) rates in 2016 among PWID in London, a link to hydromorphone controlled-release (CR) use was discovered. Heating the drug preparation prior to injection was found to be a potential harm reduction intervention for PWID injecting hydromorphone-CR and public health education of these findings is warranted.

Methods: Two focus groups with PWID injecting opioids and 11 structured interviews with front-line staff (FLS) from community agencies engaging PWID were conducted. We aimed to understand the barriers existing in heating hydromorphone-CR and identify effective dissemination strategies to then educate the community about the harm reduction practice of heating hydromorphone-CR.

Results: It was found that PWID and FLS, while aware of the harms associated with sharing or reusing injection drug preparation, were not completely knowledgeable about heating drugs, specifically hydromorphone-CR. Barriers in cooking hydromorphone-CR injectates were mainly due to the time and dexterity required to heat especially when experiencing severe withdrawal symptoms. Other factors were negative peer influences and environmental factors (e.g. weather conditions/safety/public scrutiny). The use of the temporary overdose prevention site ameliorated many of these identified barriers. PWID peer-to-peer word of mouth and one-to-one interactions with an outreach worker were considered the most trusted sources for education about harm reduction.

Conclusions: These findings informed a public health initiative around the benefits of heating all drugs including hydromorphone-CR in our city. The project results informed a harm reduction campaign that provided the following educational resources: two targeted slide decks for PWID and FLS shared through community drop-in sessions; printed resources with key messages that align with best practice recommendations for harm reduction; and the provision of a heat source (lighter). This will be the first campaign worldwide to promote cooking drugs to reduce infectious harms associated with drug injection practice.

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141 The Cedar Project: Evaluation of a culturally safe case management approach in supporting hepatitis C treatment among Indigenous people who use(d) drugs in B.C.

April Mazzuca[1], Sherri Pooyak[2,8], David Zamar[3], Margo Pearce[1], Kate Jongbloed[4,5], Victoria Thomas[1,3], Eric Yoshida[6,7], Martin Schechter[1], Patricia Spittal[1,3], The Cedar Project Partnership[8]
[1]School of Population and Public Health, University of British Columbia, Vancouver, Canada, [2]Aboriginal HIV Community-Based Research Collaborative Centre, Dartmouth, Canada , [3]BC Children's Hospital Research Institute, Vancouver , Canada , [4]School of Public Health and Social Policy Faculty of Human & Social Development University of Victoria, Victoria, Canada , [5]BC Office of the Provincial Health Officer, Victoria, Canada , [6]Faculty of Medicine, University of British Columbia, Vancouver, Canada , [7]Vancouver Coastal Health Research Institute, Vancouver, Canada , [8]The Cedar Project Partnership , Vancouver, Canada

Systemic racism drives health inequities among Indigenous people who use drugs in BC, including HCV treatment access. The HCV Blanket Program, conceptualized by Cedar Project's Indigenous governance, was developed to mitigate inequities by providing culturally safe support before, during, and after treatment. We examined program's impact on HCV treatment, reinfection, and factors disrupting adherence.

Blanket Program is a two-site pilot study nested in an Indigenous governed cohort in Vancouver and Prince George, BC. Main outcomes were sustained virologic response (SVR) at 12 weeks post-treatment and HCV RNA 9 months post-treatment. Adherence was measured through self-report scale. A priori non-inferiority margins, based on HCV specialists' recommendations, were set at: >80% SVR12 and <20% HCV RNA. Logistic regression was used to assess factors associated with imperfect adherence (>5% missed doses). Results were adjusted for location, age, and sex.

Between 2017-2019, 60 participants enrolled in the program. Fifty-three percent were female, 32% HIV coinfected, and 78% used injection drugs. Intention to treat proportion reaching SVR12 was 92% (55/60) remaining above non-inferiority margin of 80% (p=0.012, 95%CI: 0.833, 1.000). HCV RNA at 9 months post-treatment was 9% (5/55) remaining below non-inferiority margin of 20% (p=0.025; 95%CI: <0.001, 0.116). Forty-two percent (25/60) demonstrated imperfect adherence. In adjusted regression analysis, housing instability (aOR: 11.01; 95%CI: 2.22, 54.57; p= 0.003) and living in Vancouver (aOR: 5.30; 95%CI: 1.39, 20.25; p= 0.015) were associated with imperfect adherence. Recent overdose (aOR: 4.04; 95%CI: 0.91, 17.99; p= 0.067) was marginally associated with imperfect adherence. Older age (aOR: 0.90; 95%CI: 0.83, 0.99; p = 0.025) was associated with strong adherence and recent access to traditional food (aOR: 0.32; 95%CI: 0.09, 1.10; p=0.070) was marginally associated with adherence.

Findings demonstrate a culturally safe case management approach can yield high HCV cure rates and mitigate reinfection risk among Indigenous people who use(d) drugs.

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142 The Cedar Project: Changes in psychological health following a culturally safe model for HCV treatment among Indigenous Peoples who use(d) drugs in BC, Canada.

April Mazzuca[1], Sherri Pooyak[2,8], David Zamar[3], Margo Pearce[1], Kate Jongbloed[4,5], Victoria Thomas[1,3], Eric Yoshida[6,7], Martin Schechter[1], Patricia Spittal[1,3], The Cedar Project Partnership[8]
[1]School of Population and Public Health, University of British Columbia, Vancouver, Canada , [2]Aboriginal HIV/AIDS Community-Based Research Collaborative Centre , Dartmouth , Canada , [3]BC Children's Hospital Research Institute, Vancouver, Canada , [4]BC Office of the Provincial Health Officer, Vancouver , Canada, [5] School of Public Health & Social Policy Faculty of Human & Social Development, Victoria , Canada, [6]Faculty of Medicine, University of British Columbia, Vancouver, Canada, [7]Vancouver Coastal Research Institute, Vancouver, Canada, [8]The Cedar Project Partnership , Vancouver, Canada

To address inequities in HCV treatment among Indigenous people who use(d) drugs including those living with HIV, Cedar Project's Indigenous governance developed the Blanket Program, providing culturally safe care before, during and after treatment. In this study, 92% (55/60) of participants cured HCV; 91% (50/55) remained HCV-free 9 months post-treatment. Qualitative findings indicated psychological benefits from the program. This analysis used established psychological scales to examine the health impacts of receiving culturally safe care and having HCV cured.

Blanket Program is a two-site pilot study nested in an Indigenous governed cohort in Vancouver and Prince George, BC. Participants completed psychological measures at baseline and monthly during and after treatment (2017-2020). Symptom Checklist-90 Revised assessed psychological distress; PTSD Checklist – Civilian version measured post-traumatic stress response (PTSR); and Connor-Davidson Resilience Scale captured resilience. Generalized estimating equation modelling was used to examine effects on psychological health. Results were stratified by location and adjusted for age and sex. Cohen's d for paired samples was used to assess effect size of associations.

In Prince George, psychological distress mean score during treatment ($\bar{x}$ = 0.648) was significantly lower than baseline ($\bar{x}$ = 1.052) (aβ: -0.414;95%CI: -0.632, -0.195), representing a moderate mean shift in distress. Effect size was medium (Cohen's d = 0.671;95% CI: 0.265, 1.077). Similarly, PTSR mean score during treatment ($\bar{x}$ = 34) was significantly lower than baseline ($\bar{x}$ = 42) (aβ: -8.21;95%CI: -12.0, - 4.42), representing a responsive change, on average. Effect size was medium (Cohen's d = 0.593;95% CI: 0.289, 0.898). No significant change in resilience was found. In Vancouver, no significant changes were found across psychological measures. No significant changes were reported on psychological measures post-treatment.

Culturally safe case management supporting HCV cure has the potential to uphold (w)holistic health; however, integration of healing-centered programming is essential.

164 Facilitating Engagement with Pre-exposure Prophylaxis (PrEP) among Young Men who have Sex with Men (MSM) and Transgender Women in Thailand: A Practice-based Combination Prevention Analysis

Peter A Newman[1], Suchon Tepjan[2], Kangwan Fongkaew[3], Jan de Lind van Wijngaarden[4], Pakorn Akkakanjanasupar[2]
[1]University Of Toronto, Toronto, Canada, [2]VOICES-Thailand Foundation, Muang, Thailand, [3]Burapha University, Bangsaen, Thailand, [4]Independent Consultant, Bangsaen, Thailand

BACKGROUND: Approved in Thailand in 2017, fee-based PrEP is currently available. Despite national estimates of 50% of new HIV infections diagnosed among young people aged 15–24 years—the majority MSM and transgender women—PrEP usage remains low. With scale-up planned under universal health coverage, we explored a matrix of multilevel factors and public health practices that impact engagement with PrEP among young MSM and transgender women.

METHODS: We conducted 4 Thai-language focus groups (FGs) with 16–20-year-old, peer-recruited, gay men and transgender women from high schools, vocational schools, and universities, and key informant (KI) interviews (Thai or English) with HIV and youth experts, from June–August 2018 in 3 Thai provinces. FGs/interviews were transcribed and reviewed using framework analysis in Atlas.ti by a bilingual team.

RESULTS: FG participants' (MSM, n=20; transgender women, n=5) mean age was 18.0-years (SD=1.3). KIs were healthcare providers (n=5), public health officers (n=2), NGO leaders (n=5), and youth advocates (n=5). We identified intersecting individual-level barriers (competence factors: low risk-perception and condom negotiation skills; material factors: low-/no-income; symbolic factors: anticipated sexual/gender-nonconformity stigma) and facilitators (inchoate PrEP awareness, motivation to learn more) to PrEP engagement. Micro-level (relational factors: fear of disclosure to intimate partners and parents) and meso-level barriers (material: unclear PrEP guidelines, lack of local availability; relational: unsupportive healthcare providers; symbolic: sociocultural taboos around 'promiscuity'), interacted with facilitators at micro- (peer outreach/education) and meso-levels (LGBT+ community groups, gender-affirmative clinics). Government funding for free/subsidized PrEP, national/local youth-engaged PrEP campaigns, and youth-friendly clinics emerged as vital macro-level facilitators of PrEP engagement.

CONCLUSIONS: Treating PrEP not only as a biomedical intervention added to combination prevention, but as a social and public health practice contingent on a constellation of multilevel factors, can identify public health interventions and policies to facilitate PrEP engagement among young MSM and transgender women in Thailand.

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165 Intersecting Pandemics: Impacts of COVID-19 on HIV Prevention, Sexual and Reproductive Health, Mental Health and Substance Use among Racialized Sexual and Gender Minority People in the Greater Toronto Area (#SafeHandsSafeHearts)

Peter A Newman[1], Notisha Massaquoi[2], Charmaine Williams[1], Wangari Tharao[4], Suchon Tepjan[3], Joelleann Forbes[4], Sarah Sebastian[4], Pakorn Akkakanjanasupar[3], Muna Aden[4]
[1]University of Toronto, Toronto, Canada, [2]University of Toronto Scarborough, Scarborough, Canada, [3]VOICES-Thailand Foundation, Muang, Thailand, [4]Women's Health in Women's Hands Community Health Centre, Toronto, Canada

BACKGROUND: Owing to ongoing marginalization, racialized sexual and gender minority populations experience adverse social determinants of health and resultant health disparities that increase vulnerability amid the COVID-19 pandemic. Nevertheless, pandemic response preparedness and public health responses typically operate from Eurocentric, hetero- and cis-normative perspectives that fail to account for marginalization. We assessed impacts of the COVID-19 pandemic on HIV prevention/sexual and reproductive health, mental health, and substance use among racialized LGBTQ+ individuals in the Greater Toronto and Hamilton Area (GTHA).

METHODS: Sexual and gender minority, predominantly racialized, people ≥18-years were recruited online from March to November 2021 through CBO and health-centre listservs and LGBTQ+ media. A 60-minute, mobile-optimized online survey assessed COVID-19 pandemic impacts on HIV prevention/sexual and reproductive healthcare access, mental health (PHQ-2, GAD-2), and alcohol (AUDIT)/substance use. Gender- and sex-based analysis identified subgroup differences.

RESULTS: Participants (n=197) (median age:27 [IQR:23-32]) identified as African/Caribbean/Black (29.5%), South/East/Southeast Asian (27.5%), Latinx/Hispanic (9.0%), white (20.3%), and other (13.7%). Half (54.3%) identified as cisgender lesbian/bisexual/women who have sex with women (LBWSW), 25.9% cisgender gay/bisexual/men who have sex with men (GBMSM), and 19.8% transgender/gender-nonbinary people. Participants reported decreased access to HIV testing (30.3%), STI testing (38.8%), PrEP (20.0%), condoms (25.7%), other reproductive health products (30.3%; 40.7%* for LBWSW), and gender-affirming hormones (15.4%) among transgender people. LBWSW (63.6%*/73.8%*) and transgender/gender-nonbinary people (66.7%/71.8%) were more likely to screen in for depression and anxiety than GBMSM (43.1%*/54.9%*; *p<.05). Over one-third reported increased illicit drug (33.8%) and alcohol use (37.2%) since COVID-19, and 44.2% hazardous drinking.

CONCLUSIONS: Tailored community-based outreach and interventions based on intersecting marginalized identities and intersecting pandemic threats for gender minority, sexual minority, and racialized people are needed to address high rates of mental health and substance use issues, and increase access to HIV and sexual/reproductive health services amid the COVID-19 pandemic in the GTHA.

173 CTN 328: Immunogenicity outcomes in people living with HIV in Canada following vaccination for COVID-19 (HIV-COV): Protocol for an observational cohort study

Cecilia Costiniuk[1,2,3], Joel Singer[4,5,6], Marc-André Langlois[7], Iva Kulic[5,6], Judy Needham[5,6], Ann Burchill[8], Mohammad-Ali Jenabian[9,3], Sharon Walmsley[10], Mario Ostrowski[11], Colin Kovacs[12], Darrell Tan[10,13,14], Marianne Harris[15], Mark Hull[15], Zabrina Brumme[15,16], Mark Brockman[15,16,17], Shari Margolese[5], Enrico Mandarino[5], Joanthan Angel[7,18], Jean-Pierre Routy[1,2,19], Aslam Anis[4,5,6], Curtis Cooper[18]

[1]Division of Infectious Diseases/Chronic Viral Illness Service, McGill University Health Centre, Royal Victoria Hospital, Montreal, Canada, [2]Infectious Diseases and Immunity in Global Health Research Institute of McGill University Health Centre, Montreal, Canada, [3]Department of Microbiology and Immunology, McGill University, Montreal, Canada, [4]School of Population and Public Health, University of British Columbia, Vancouver, Canada, [5]Canadian HIV Trials Network, Vancouver, Canada, [6]Centre for Health Evaluation and Outcome Sciences, Vancouver, Canada, [7]Department of Biochemistry, Microbiology and Immunology, University of Ottawa, Ottawa, Canada, [8]Department of Family and Community Medicine, St Michael's Hospital, Unity Health Toronto and Dalla Lana School of Public Health, University of Toronto, Toronto, Canada, [9]Department of Biological Sciences, Université du Québec à Montréal, Montreal, Ontario, [10]Department of Medicine, Division of Infectious Diseases, University of Toronto, Toronto, Canada, [11]Clinical Sciences Division and Department of Immunology, University of Toronto, Li Ka Shing Knowledge Institute, St. Michael's Hospital, Toronto, Canada, [12]Maple Leaf Medical Clinic, Toronto, Canada, [13]MAP Centre for Urban Health Solutions, St Michael's Hospital, Toronto, Canada, [14]Institute of Public Health Policy, Management and Evaluation, Dalla Lana School of Public Health, University of Toronto, Toronto, Canada, [15]British Columbia Centre for Excellence in HIV/AIDS, Vancouver , Canada, [16]Faculty of Health Sciences, Simon Fraser University, Burnaby, Canada, [17]Department of Molecular Biology and Biochemistry, Faculty of Science, Simon Fraser University, Burnaby, Canada, [18]Department of Medicine, Division of Infectious Diseases, The Ottawa Hospital and the Ottawa Hospital Research Institute , Ottawa, Canada, [19]Division of Hematology, Department of Medicine, McGill University Health Centre, Montreal, Canada

Background: Most existing vaccines require higher or additional doses or adjuvants to provide similar protection for people living with HIV (PLWH) compared to HIV-uninfected individuals. Additional research is necessary to inform COVID-19 vaccine use in PLWH.

Methods: This multi-centred observational Canadian cohort study will enroll 400 PLWH aged >16 years from Montreal, Ottawa, Toronto and Vancouver. Subpopulations of PLWH of interest will include: 1) >55 years of age 2) CD4 counts <350 cells/mm 3) multimorbidity (>2 comorbidities) and 4) "stable" or "reference" PLWH (CD4 T cells >350 cells/mm3, suppressed viral load for > 6 months and <1 comorbidity). Data for 1000 HIV-negative controls will be obtained via a parallel cohort study, (Stop the Spread Ottawa (SSO), using similar time points and methods. Participants receiving >1 COVID-19 vaccine were scheduled to attend 5 visits: pre-vaccination; 1 month following the first vaccine dose; and at 3, 6 and 12 months following the second vaccine dose.

With the advent of the booster vaccine anticipated to be delivered to the majority of participant at 6-12 months post second vaccination, the protocol was amended to include visits at 1, 6 and 12 months post booster. The primary endpoints will be the percentage of PLWH with COVID-19-specific antibodies at 6 months following the second vaccine dose and at 6 months post-booster.

Humoral and cell-mediated immune responses, and the interplay between T cell phenotypes and inflammatory markers, will be described.

Analysis: Regression techniques will be used to compare COVID-19-specific immune responses to determine whether there are differences between the “unstable” (CD4<350) PLWH group, the stable PLWH cohort and the HIV-negative controls, adjusting for factors believed to be associated with immune response. Unadjusted analyses will reveal whether there are differences driving factors associated with group membership. Preliminary results will be presented.

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180 Developing Reporting Guidelines for Studies of Pre-treatment HIV Drug Resistance: A Mixed-methods Study

Cristian Garcia[1], Nadia Rehman[1], Lawrence Mbuagbaw[1,2,3], Daeria Lawson[1], Pascal Djiadeu[1]
[1]Department of Health Research Methods, Evidence, and Impact, McMaster University, Hamilton, Canada, [2]Biostatistics Unit, Father Sean O'Sullivan Research Centre, St Joseph's Healthcare, Hamilton, Canada, [3]Centre for the Development of Best Practices in Health, Yaoundé Central Hospital, Yaoundé, Cameroon

Background: HIV drug resistance limits the effectiveness of antiretroviral therapy. Adequate surveillance of HIV drug resistance is challenged by heterogenous and inadequate data reporting. This study sought to develop a reporting checklist for studies of HIV drug resistance by achieving consensus among experts on what items should be reported in these studies.

Methods: We conducted a sequential explanatory mixed methods study among authors and users of studies of HIV drug resistance. The two-phase design included a cross-sectional electronic survey (quantitative phase) followed by a focus group discussion (qualitative phase). Survey participants rated the essentiality of various reporting items like study-level items, participant items, and HIV resistance testing items. Responses were analyzed using a validity ratio to determine the items that were retained for further evaluation in a focus group discussion to produce a finalized set of reporting items.

Results: Study invitations were sent via email to 160 HIV drug-resistance experts, of which 46 participants completed the electronic survey. Respondents were mostly male (63%) with at least one participant from each WHO region. The mean age of respondents was 48.1 (SD=10.5) years with an average of 17 years (SD=9.45) in their primary role. Of the 22 initial reporting items surveyed, fourteen were rated as essential and were evaluated further during focus group discussions. Nine participants participated in virtual focus groups to evaluate the list reporting items and additional items suggested by survey participants. From these discussions thirty-two additional items were added to in the final version of the reporting item checklist.

Conclusion: We present the complete reporting checklist aiming to improve the complete and uniform reporting of HIV drug resistance data. The results of this work will be refined and elaborated on by a writing committee of HIV drug resistance experts and external reviewers to develop finalized reporting guidelines.

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186 PRIMP PrEP Cascade Results: Only a minority of healthcare encounters among PrEP-eligible gbMSM lead to PrEP initiation

Oscar Javier Pico-Epinosa[1,2], Mark Hull[3], Saira Mohammed BHE[3], Zavare Tengra[4], Allison Chris[5], Bruce Clarke[5], Marion Selfridge[6], Chris Fraser[6], Karen Lundren[6], Phillippe El-Helou[7], Sophie Banner-Martin[8], Wendy Stark[8], Troy Grennan[9], Paul MacPherson[10], Isaac Bogoch[11], David Hall[12], Kassie Junek[12], Kevin Woodward[13], Ninh Tran[14], **Darrell, HS Tan[1]**

[1]Unity Health Toronto - St. Michael's Hospital, Toronto, Canada, [2]University of Toronto, Toronto, Canada, [3]BC Centre for Excellence in HIV/AIDS, Vancouver, Canada, [4]Hassle Free Clinic, Toronto, Canada, [5]Toronto Public Health, Toronto, Canada, [6]Cool Aid Clinic, Victoria, Canada, [7]Maple Leaf Medical Clinic, Toronto, Canada, [8]Island Health, Victoria, Canada, [9]British Columbia Centre for Disease Control, Vancouver, Canada, [10]University of Ottawa, Ottawa, Canada, [11]Toronto General Hospital, Toronto, Canada, [12]Vancouver Coastal Health, Vancouver, Canada, [13]McMaster University, Hamilton, Canada, [14]Hamilton Public Health, Hamilton, Canada

Background: The PrEP cascade is a useful heuristic for evaluating the health system's ability to link individuals to PrEP services.

Methods: Using electronic and paper records at 17 sites in urban British Columbia and Ontario, we documented the number and proportion of healthcare encounters with HIV-negative, non-PrEP-using gay, bisexual and other men who have sex with men (GBM) who met the following cascade steps: 1) identified as meeting evidence-based Canadian guideline criteria; 2) staff recommended PrEP; 3) individual accepted PrEP referral; 4) PrEP referral made; 5) PrEP clinic attended; 6) PrEP initiated; 7) maintained on PrEP for ≥6 months. For each cascade step, we assessed for differences over the five 6-month periods (P1-P5) between Dec/2018-May/2021 using the Spearman's rank correlation coefficients to test for trends, and compared overall results between provinces using Chi-square tests.

Results: Data on 5116 encounters (Table) showed no significant changes in any cascade steps between P1-P5 (Table). Across all five periods, there were no significant differences between BC and ON, except in steps "2) staff recommended PrEP" (94% vs 75%, p<0.001) and "4) PrEP referral made" (57% vs 40%, p=0.016). The largest cascade gap relates to eligible individuals declining recommendations for PrEP. The next largest gaps related to recommending PrEP to eligible individuals (BC) and failure to attend PrEP clinic (Ontario).

Conclusions: The large majority of healthcare encounters with GBM meeting evidence-based criteria for PrEP initiation did not result in PrEP initiation. New interventions to optimize the PrEP cascade are urgently needed.

Supporting Document

Table

Province	Overall (ON and BC)						ON	BC	
Cascade step\Period	**P1**	**P2**	**P3**	**P4**	**P5**	**p-value[a]**	**All periods**	**All periods**	**p-value[b]**
Identified	1	1	1	1	1	-	1.00	1.00	-
PrEP recommended	0.68	0.86	0.83	0.95	0.89	0.104	0.94	0.75	<0.001
Accepted referral	0.51	0.43	0.43	0.45	0.44	0.805	0.57	0.45	0.090
Referred for PrEP	0.51	0.38	0.36	0.45	0.44	0.747	0.57	0.40	0.016
Attended PrEP clinic	0.46	0.32	0.28	0.35	-	0.600	0.27	0.40	0.051
PrEP initiated	0.25	0.23	0.17	0.29	-	0.800	0.22	0.23	0.886
Retained on PrEP	0.14	0.15	0.12	0.13	-	0.400	0.18	0.14	0.440

[a] p-value for Spearman test for trend across periods. [b]p-value for Chi-square test for differences between provinces.

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187 Experience with the Point-of-care Biolytical INSTI HIV Test in a COVID-19 Post-Exposure Prophylaxis trial

Attia Qamar[1], Adrienne Chan[2], Allison McGeer[3], Curtis Cooper[4], Sydney Currier[1], Peter Juni[1], Srinivas Murthy[5], Nick Daneman[2], Darrell, HS Tan[1]
[1]Unity Health Toronto - St. Michael's Hospital, Toronto, Canada, [2]Sunnybrook Hospital, Toronto, Canada, [3]Mount Sinai Hospital, Toronto, Canada, [4]The Ottawa Hospital, Ottawa, Canada, [5]University of British Columbia, Vancouver, Canada

Background: HIV self-testing recently received regulatory approval in Canada and experience with its use in the general population is limited. We assessed the usability of the Biolytical INSTI HIV self-test in a randomized controlled trial of the antiretroviral drug Lopinavir/ritonavir as COVID-19 post-exposure prophylaxis.

Methods: The COVID-19 Ring-Based Prevention trial randomized individuals with a confirmed SARS-CoV-2 exposure to 14 days of LPV/r or control (no drug). Active arm participants performed the INSTI self-test at baseline with remote assistance (Zoom). Study staff assessed the quality of test conduct. Participants completed an electronic survey about testing experience satisfaction. We analyzed results descriptively.

Results: 123 participants were enrolled before the trial was terminated early due to COVID-19 vaccine availability. Of 60 active arm participants, 41 (68.3%) were female, 7 (11.7%) healthcare workers and the most common age category 19-39 years (46.7%). 22/45 (48.9%) participants had previously been HIV-tested with 2 having done point-of-care testing. 48 participants performed the INSTI self-test, with 37 non-reactive and 11 (22.9%) indeterminate results. Only 3 of the indeterminate results were observed to be performed correctly; common problems included incorrect lancet use and insufficient blood volume for the test. 4/60 (6.7%) participants refused to self-test. Roughly one third of active arm participants did not complete the survey. Among survey respondents, 37/41 (90.2%) survey respondents agreed/strongly agreed that the test was easy to do, 37/40 (92.5%) agreed/strongly agreed the instructions were easy to follow, 33/41 (80.5%) were confident in the results and 31/41 (75.6%) would prefer it over standard blood testing, but 14/41 (34.1%) were not sure if they performed the test correctly.

Conclusions: While most participants in this general population COVID-19 prevention trial appeared satisfied with their HIV self-testing experience, a considerable proportion declined to self-test or obtained indeterminate results despite remote staff supervision.

188 Sex, Safety, and A(nother) Pandemic: Effective Messaging for Sexual Health During COVID-19

Adam Awad[1]
[1]*Gay Men's Sexual Health Alliance (gmsh), Toronto, Canada*

As the world locked down in March 2020, public health authorities (PHAs) offered little to no guidance for sexual encounters to reduce the risk of COVID transmission. Sexual and gender minorities—already at risk for isolation and increased health disparities—were further marginalized. Sex is an affirming experience essential for mental, emotional, sexual, and physical well-being. The first guidance came from the City of New York's public health department and offered a harm reduction approach and practical guidance for those seeking to have sex.

Queer men aren't strangers to managing risk related to sex, and abstinence-only messaging is ineffective. The Gay Men's Sexual Health Alliance (GMSH) translated technical information into relevant messaging for gay, bisexual, and queer men, including those who engage in Party & Play/chemsex. The challenge was to adapt existing messaging into formats, framing, and platforms that would reach the community.

Between April 2020 and August 2021, the GMSH released a suite of digital resources that provided clear guidance on sexual activity based on the most relevant and recent public health information.

In total, the GMSH produced:

– A detailed web resource: TheSexYouWant.ca/COVID-19
– Detailed infographics on COVID-19, sex, and HIV
– A community-based virtual discussion on Party & Play: Sex, Drugs, and COVID-19
– A curated discussion between film and TV producer Michael Yerxa and Toronto drag queen Tynomi Banks on sexual choices in the early days of the pandemic
– A direct-to-camera video with drag queen Brooke Lynn Heights with a message of encouragement for members of the LGBTQ2S+ community
– Three series of PSA videos with the queer burlesque troupe BoylesqueTO

The resources were shared on social media and run as digital ads across various sites, reaching over 300,000 people across Ontario. There remains little COVID-related guidance on sex from most PHAs in Canada.

189 Capturing the Male Gays: A Practical Toolkit for Research Participant Recruitment

Adam Awad[1]
[1]*Gay Men's Sexual Health Alliance (gmsh), Toronto, Canada*

Researchers who recruit gay, bisexual, and queer men as participants for their studies face an uphill battle. In addition to their core research work, they are expected to be good communicators, designers, and marketers. HIV researchers already know that the quality of source data can have major impacts on research findings, raising the pressure to recruit diverse and engaged participants. Unfortunately, many recruitment efforts fall short of today's standards for digital marketing and don't capture the attention of the community. The Tri-Council ethics policy sets out that researchers must "clearly explain the nature and goals of the research, and other essential information, in a manner that best promotes understanding on the part of prospective participants." Arguably, most recruitment falls short of this expectation, despite researchers' best efforts. As a result, fewer potential participants are reached, and the recruitment process is ineffective.

To reach the right people, it's time to retire the PDF recruitment poster and take advantage of the newer tools and platforms at our disposal.

The Gay Men's Sexual Health Alliance (GMSH) regularly engages in community recruitment and supports researchers' recruitment efforts. As a leader in digital communications in the HIV sector, the GMSH reaches hundreds of thousands of people across Ontario each year.

Drawing from this success (and the lessons learned along the way), the GMSH has developed a practical toolkit for participant recruitment. This session will present the toolkit and set out tangible guidance on recruiting participants: plain language tips and tricks, which platforms to use and when, how to set targets and measure success, and case studies from across the sector.

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191 Piloting a novel online community-based exercise intervention with adults living with HIV: Factors influencing initial implementation

Tizneem Jiancaro[1], Brittany Torres[1], George Da Silva[1], Francisco Ibanez-Carrasco[1], Patty Solomon[2], Ahmed Bayoumi[1,7,11], Soo Chan Carusone[3], Ada Tang[2], Mona Loutfy[1,4,13], C Price[5], Shaz Islam[6], Joanne Lindsay[7], Ivan Ilic[8], Zoran Pandovski[8], Mehdi Zobeiry[8], Katrina Krizmancic[9], Puja Ahluwalia[10], Chris Godi[14], Darren Brown[16], Lisa Avery[12,15], Kelly O'Brien[1]
[1]University Of Toronto, Toronto, Canada, [2]McMaster University, Hamilton, Canada, [3]Casey House, Toronto, Canada, [4]Women's College Research Institute, Toronto, Canada, [5]Ontario HIV Treatment Network Cohort Study, , Canada, [6]Alliance for South Asian AIDS Prevention, Toronto, Canada, [7]MAP Centre for Urban Health Solutions, Toronto, Canada, [8]Central YMCA, Toronto, Canada, [9]Aids Committee of Toronto, Toronto, Canada, [10]REALIZE, Toronto, Canada, [11]St. Michaels' Hospital, Toronto, CA, [12]University Health Network, Toronto, CA, [13]Women's College Hospital, Toronto, CA, [14]Toronto PWA, Toronto, CA, [15]Avery Information, Oshawa, CA, [16]Chelsea and Westminster Hospital NHS Foundation Trust, London (UK), London, UK

Introduction: Community-based exercise (CBE) is a rehabilitation strategy that promotes health amongst people living with HIV. During the COVID-19 pandemic, needs for novel modes of CBE delivery escalated. The Tele-coaching Exercise (TEx) study is a CBE intervention for adults living with HIV, delivered entirely online. We report on factors influencing the initial TEx implementation.

Methods: The TEx study aims to evaluate a 6-month intervention/6-month follow-up CBE program, including 13 biweekly personalized Zoom sessions with a YMCA trainer; 6 monthly online group self-management educational sessions; basic home exercise equipment; access to the YMCA exercise app; and a Fitbit to track physical activity (synced weekly). Fitness and questionnaire assessments are administered online, bimonthly. Two researchers documented and verified implementation factors articulated by participants and the implementation team (i.e., researchers and YMCA staff) during early implementation (from recruitment to equipment distribution, technology orientation, and baseline testing).

Results: Thirty-three Toronto-based participants enrolled in the study. Factors, as reported by participants, spanned four domains: Personal, including health (e.g. episodic illness, stress levels), disposition (e.g. commitment, e-literacy, communication preferences) and resources (e.g. time/cost constraints); Environmental including home (e.g. privacy, space) and technology (e.g. device access, device/app interoperability); Organizational including information dissemination (e.g. email updates, tech support) and logistics (e.g. baseline scheduling); and Societal, including COVID-19 impacts (e.g. public transit health risks impacting equipment pick-ups).

Accordingly, the implementation team experienced heightened needs to respond rapidly; sustain engagement, and provide a/synchronous training and support. Additional Organizational factors included a committed staff with skills spanning administration and logistics, participant engagement, technology training, instructional design, physical therapy, research ethics, and project management.

Conclusion: Numerous factors spanning multiple domains signals the complexities of this online CBE launch. Initial implementation required a dedicated, multi-skilled, multi-stakeholder team. Future work includes systematically mapping these and other factors to visualize and inform implementation scale-up.

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194 Factors associated with acceptability of online sexually transmitted and blood-borne infection (STBBI) testing sexual minority men living in Ontario, Canada

Joshun Dulai[1], Mark Gilbert[2,3], Nathan J. Lachowsky[4,5], Kiffer Card[4,5], Ben Klassen[4], Ann N. Burchell[1,6], Catherine Worthington[5], Aidan Ablona[2], Praney Anand[1,7], Ezra Blaque[1,8], Heeho Ryu[1], MacKenzie Stewart[1], David J. Brennan[8], Daniel Grace[1]

[1]University of Toronto, Toronto, Canada, [2]British Columbia Centre for Disease Control, Vancouver, Canada, [3]School of Population and Public Health, University of British Columbia, Vancouver, Canada, [4]Community-Based Research Centre, Vancouver, Canada, [5]School of Public Health and Social Policy, University of Victoria, Victoria, Canada, [6]St. Michael's Hospital, Toronto, Canada, [7]Alliance for South Asian AIDS Prevention, Toronto, Canada, [8]Factor-Inwentash Faculty of Social Work, University of Toronto, Toronto, Canada

Background: Gay, bisexual, and other men who have sex with men (GBM) are disproportionately affected by sexually transmitted and blood-borne infections (STBBIs). As the potential for online STBBI testing grows, understanding factors associated with acceptability of online testing will be useful in expanding access. We examined factors that may be associated with acceptability of online STBBI testing among GBM living in Ontario.

Methods: Sex Now 2019 was an online national bilingual cross-sectional survey of GBM aged ≥15 conducted from November 4, 2019 until February 6, 2020. We asked participants in Ontario if they were likely or unlikely to use an online STBBI testing service. Prevalence ratios (PR) and 95% confidence intervals (95% CI) for univariate and multivariable analysis were calculated using modified Poisson regression with robust variances due to convergence issues when using log-binomial regression. The multivariable model was built using the iterative Hosmer-Lemeshow-Sturdivant approach.

Results: Among 1355 respondents, 80.9% reported being likely to use online STBBI testing. Older age (PR: 0.993; 95% CI: 0.991 – 0.996), increased sexual behaviours associated with higher risk of STBBI infection (PR: 1.034; 95% CI: 1.020 – 1.049), being born outside of Canada (PR: 1.099; 95% CI: 1.026 – 1.177), and not completing high school (PR: 0.798; 95% CI: 0.648 – 0.984) remained statistically significant in the final model. Being on pre-exposure prophylaxis for HIV (PrEP) became statistically significant in the final model (PR: 0.893; 95% CI: 0.827 – 0.965).

Conclusion: Likelihood of using online STBBI testing was high among GBM in Ontario, particularly among those: younger in age, not born in Canada, with higher levels of education, and who are currently using PrEP. Implementation in Ontario may expand access to testing for these subpopulations.

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206 Demographic, Sexual Health and Provider Related Characteristics of Women using PrEP in Ontario: a descriptive study from the ON-PrEP Cohort

Yasamin Sadeghi[1], Nila Parvaresh[2], Ryan Lisk[3], Jeffrey Reinhart[8], Trevor A. Hart[4,5], Sharmistha Mishra[1,2,6], David Knox[7], Mia Biondi[9], Paul MacPherson[10], Ann Burchell[2,5], Sean Sullivan[11], Kevin Woodward[12], Darrell H. S. Tan[1,2,6]

[1]Institute of Medical Science, University of Toronto, Toronto, Canada, [2]MAP Centre for Urban Health Solutions, St. Michael's Hospital, Toronto, Canada, [3]AIDS Committee of Toronto, Toronto, Canada, [4]Ryerson University, Toronto, Canada, [5]University of Toronto, Toronto, Canada, [6]Division of Infectious Diseases, St. Michael's Hospital, Toronto, Canada, [7]Maple Leaf Medical Clinic, Toronto, Canada, [8]Sherbourne Health Centre, Toronto, Canada, [9]Toronto Centre for Liver Disease, Toronto General Hospital, Toronto, Canada, [10]Ottawa Hospital Research Institute, Ottawa, Canada, [11]Northern Ontario School of Medicine, Sudbury , Canada, [12]Faculty of Health Sciences, McMaster University, Hamilton, Canada

Background: Despite ongoing rollout of Pre-Exposure Prophylaxis (PrEP) in Ontario, only 3% of users are female. We describe woman enrollees in the Ontario PrEP Cohort Study (ON-PrEP) to shed light on the characteristics of those reached with this prevention technology.

Methods: ON-PrEP is a cohort of HIV-negative individuals using/initiating PrEP throughout Ontario. Data on biological, sexual activity and healthcare utilization outcomes were collected using 6-monthly electronic questionnaires. We describe baseline characteristics of cis, trans and non-binary women enrolled into ON-PrEP by Dec/2021.

Results: Of 20 women in a cohort of 679 (2.9%), 12 were assigned female and 8 male at birth. Eighteen (90%) identified as female while 2 identified as queer or non-binary. Median age was 38 (32, 41) years and 19 (95%) preferred speaking English with healthcare providers. Nine were bisexual, 6 heterosexual and 5 lesbian/gay/other. Eleven (55%) people had a primary sexual partner. Ten of those partners were non-transgender men, 5 (45%) HIV+ with undetectable viral load and 6 HIV-/unknown status. Among the same 11 enrolees, 5 had discussed sexual monogamy with their partners and 6 either had not discussed or agreed to have other sex partners. Eight (40%) participants had exchanged sex for commodity/money with a median of 12.5 (6.25, 21.25) people in the past 3 months. Fourteen (74%) women went to family doctors for immediate care of minor health problems. Participants also received regular healthcare from specialists (35%), pharmacists (30%), mental health professionals (30%) or other family doctors (30%). Most participants (60%) had taken >1 HIV test in the past year and 80% reported equally or more frequent STI versus HIV testing.

Conclusion: Preliminary data suggest that PrEP-using women in Ontario represent diverse gender identities, sexual orientations, and patterns of sexual and health-seeking behaviours. Multiple strategies are needed to expand PrEP uptake in Ontario women.

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207 Patient's Own Perception of Health and Physical Frailty in HIV

Mehmet Inceer[1], Nancy Mayo[1]
[1]*Mcgill University, Montreal, Canada*

Background: Identification of physical frailty is important to people with HIV as the occurrence could be 10 years earlier than the general population. Systematic identification of physical frailty is difficult as it requires regular testing of physical function and body composition. Self-rated health (SRH) is known predictor of disability and mortality. Therefore, we designed a study to estimate the extent to which physical frailty and frailty indicators are statistically predictive of self-rated health (SRH) in people living with HIV.

Methods: Baseline data from the Brain Health Now Study (n=856) was used. Fried's 5 criteria for physical frailty (exhaustion, low physical activity, slow gait speed, hand weakness, and low BMI) were approximated by self-report items. People with ≥3/5 criteria were classified frail. SRH, measured on a 0 to 100 visual analog scale, was regressed on the 5 frailty indicators and on a binary classification frail or not. All models included age and sex.

Results: Overall, 14.7% of the sample were classified as physically frail and their SRH was, on average, 59.2 (SD: 18.3), lower than those classified as not frail (mean: 78.5; SD: 13.8; β: -18.7; SE: 1.4). People classified as frail would be categorized with poor to fair health. In contrast, those not frail would be categorized with good to very good health. The strength of the relationship between frailty and SRH were exhaustion and proxy grip strength (β: -8.1); proxy slow gait speed (β: -6.5); low physical activity (β: -4.9); and low body mass (β: -3.0; p=0.06).

Conclusion: While the global concept of "physical frailty" predicted SRH, no single criteria predominated. However, among those reporting fair/poor health (n=123), 46.3% were classified as frail and among those reporting good/better health (n=713) 9% were classified as frail. Thus, using a single item for SHR could prioritize people for in-depth frailty testing.

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211 Impacts of COVID-19 restrictions on access to HIV and other healthcare services among women living with HIV and HIV-negative women participating in the BC CARMA-CHIWOS Collaboration (BCC3) Study: Preliminary Data

Angela Kaida[1,2], Elizabeth King[2,5], Shelly Tognazzini[1], Sophie Patterson[1,3], Amber R. Campbell[2,4], Tetiana Povshedna[6,7], Shayda A. Swann[2,5], Sofie A. Levy[2,4], Valerie Nicholson[1,8], Ulrike Mayer[2], Arianne Albert[2], Melanie CM Murray[2,4,5], Hélène CF Côté[2,6,7]

[1]Faculty of Health Sciences, Simon Fraser University (SFU), Burnaby, Canada, [2]Women's Health Research Institute (WHRI), BC Women's Hospital and Health Centre, Vancouver, Canada, [3]Faculty of Health and Medicine, University of Lancaster, Lancaster, England, [4]Oak Tree Clinic, BC Women's Hospital and Health Centre, Vancouver, Canada, [5]Faculty of Medicine, University of British Columbia (UBC), Vancouver, Canada, [6]Department of Pathology and Laboratory Medicine, University of British Columbia (UBC), Vancouver, Canada, [7]Centre for Blood Research, University of British Columbia (UBC), Vancouver, Canada, [8]Epidemiology and Population Health, BC Centre for Excellence in HIV/AIDS, Vancouver, Canada

Background: COVID-19 restrictions required that many healthcare services be offered virtually, alone or combined with in-person care. We assessed whether restrictions altered how women living with HIV (WLWH) accessed healthcare services compared with HIV-negative women.

Methods: We used survey data from the British Columbia CARMA-CHIWOS Collaboration (BCC3) study, which examines healthy aging among WLWH and controls. Participants were asked about their healthcare needs since COVID-19 restrictions began (03/2020), whether and how they accessed services (virtual and/or in-person), and difficulties accessing services. Virtual care satisfaction and preference were assessed. Wilcoxon rank sum or Fisher's exact tests assessed differences by HIV status.

Results: Between January-November 2021, 65 WLWH and 59 controls (median age=51 [IQR:42-58] vs. 46 [IQR:28-55]; p=0.050) completed COVID-19 survey questions. WLWH reported being "much more/more likely" to consult a healthcare provider for medical concerns now compared to before COVID-19 restrictions (45% vs 15% controls; p=0.002). Most WLWH reported needing HIV medical care (95%), of whom 98% accessed care (40% in-person; 7% virtual; 52% combination), with 9.7% reporting access difficulties. Similarly, 92% of WLWH reported needing antiretrovirals, 98% accessed them, with 3.3% reporting difficulties. Notably, 23% (3/13) of all those needing sexual health services did not access them (25% WLWH vs. 20% controls; p=1.00). Difficulties accessing other needed health services were highest for routine check-ups (18%), grocery/food programs (18%), and cancer screening (13%), with no differences by HIV status (p>0.05). Participants accessing virtual care were largely satisfied (78%), with 44% preferring to receive virtual care alone or combined with in-person care (48% WLWH vs 41% controls;p=0.47).

Conclusions: WLWH were more likely than controls to need healthcare services during COVID-19 restrictions. While WLWH were able to access HIV-related care with few difficulties, women experienced challenges accessing other essential services. Satisfaction with virtual care offers insights into hybrid care delivery models for WLWH.

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213 Resource insecurity, mental health and uptake of sexual and reproductive health services among urban refugee adolescent girls and young women in Uganda: What role does motherhood status play?

Kalonde Malama[1], Carmen Logie[1], Moses Okumu[2], Robert Hazika[3], Simon Mwima[4], Peter Kyambadde[5]
[1]University Of Toronto, Toronto, Canada, [2]University of Illinois Urbana-Champaign, Urbana-Champaign, USA, [3]Young African Refugees for International Development, Kampala, Uganda, [4]Uganda Ministry of Health, Kampala, Uganda, [5]Mulago Hospital, MARP Clinic, Kampala, Uganda

Introduction: Adolescent girls and young women (AGYW) are at dual risk of HIV infection and unintended pregnancy. This risk is compounded for refugee youth living in informal settlements, where poverty is prevalent and access to sexual and reproductive health (SRH) services is constrained. Being a young mother in informal settlements could aggravate existing conditions of resource scarcity and poor access to SRH services. To explore this, we analysed the factors associated with motherhood among refugee AGYW in Kampala, Uganda.

Methods: We conducted a cross-sectional study with refugee youth aged 16-24 in five informal settlements in Kampala. Peer research assistants administered questionnaires collecting information on sociodemographics (age, education), resource insecurity (employment, food insecurity), mental health (depression), and uptake of SRH services in the past three months. The SRH services examined were HIV counselling and testing; STI testing; and contraception (condoms, contraceptive pills, injections, intrauterine device, emergency pill, emergency patch). We used a generalised linear log binomial regression to test the factors associated with motherhood. Our multivariable model adjusted for age and generated adjusted prevalence ratios (aPR) with 95% confidence intervals (CI).

Results: We included AGYW (n=313) aged 16-24 with a median age of 19 (interquartile range: 17-22), 23% (n=76) of whom had children. Having children was associated with greater odds of reporting food insecurity (AOR: 1.96, 95% CI: 1.07-3.61), depressive symptoms (aPR: 2.03, 95% CI: 1.09–3.80), and contraception uptake (aPR: 2.37, 95% CI: 1.58–3.56) compared to not having children.

Conclusion: Having a child was associated with higher uptake of contraception and higher likelihood of depression and food insecurity. Mental health and resource insecurity interventions are required for AGYW with children in informal settlements. SRH services should be promoted to refugee AGYW without children to prevent HIV and unplanned pregnancy.

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215 Impacts of COVID-19 on Access to HIV Testing among Two-Spirit, Gay, Bisexual, & Queer Men in Manitoba

Rusty Souleymanov[1], Sana Amjad[1], Samantha Moore[1], Albert McLeod[2], Mike Payne[3], Laurie Ringaert[4], Linda Larcombe[1], Gayle Restall[1]
[1]University Of Manitoba, Winnipeg, Canada, [2]Two-Spirited People of Manitoba Inc., Winnipeg, Canada, [3]Nine Circles Community Health Centre, Winnipeg, Canada, [4]Manitoba HIV-STBBI Collective Impact Network

Background: This study examined the relationship between socio-demographics, social determinants of health, and access to HIV testing during the COVID-19 pandemic among Two-Spirit, gay, bisexual, and queer (2SGBQ+) men in Manitoba.

Method: Data were drawn from a community-based study (conducted in 2021) which examined the impacts of the COVID-19 pandemic on access to sexual health services and HIV testing among 2SGBQ+ men in Manitoba. Logistic regression analyses assessed the relationship between socio-demographics/social determinants of health (age, ethnicity, sexual orientation, gender identity, income, education, geographic location, relationship status) and the impact of COVID-19 on reduced access to HIV testing (analytic outcome).

Result: Among 347 participants, 27.7% reported that COVID-19 affected their access to HIV testing in Manitoba. In multivariate analyses, living in Brandon, medium size city of 30,000 to 49,000 people (AOR =11.58, 95%CI = 3.48 - 38.48) and living in rural and remote areas with less than 1,000 people (AOR =25.19, 95%CI = 1.98 - 32.01) compared to living in Winnipeg, were both associated with higher odds of reporting a reduced access to HIV testing during the COVID-19 pandemic. Participants who were dating (compared to those who were married or partnered) were also significantly more likely to report a reduced access to HIV testing (AOR=6.07, 95%CI:2.06-14.95).

Conclusion: Healthcare services must be prepared to respond to the impact of COVID-19 on HIV testing among sexually active 2SGBQ+ men, as well as 2SGBQ+ men who live in medium size cities or rural and remote areas in Manitoba. Rural providers should be encouraged to routinely offer HIV screening to 2SGBQ+ men throughout the COVID-19 pandemic. Targeted interventions are also needed to remove structural barriers to HIV testing in smaller and rural communities for both the pandemic and the post-pandemic periods.

218 Uptake of HIV testing among African, Caribbean, and Black heterosexual men in Ontario, Canada: The role of individual and collective resilience

Roger Antabe, Winston Husbands, Josephine Wong, Isaac Luginaah, weSpeak Team Ontario
[1]*University Of Toronto Scarborough, Toronto, Canada*

Research increasingly recognizes the role of protective factors such as individual and collective resilience in minimising people's predisposition to adverse health outcomes including HIV infection.

Consequently, HIV prevention programs are recommended to adopt a holistic approach that integrate individual and collective resilience as a strategy to empowering individuals and groups to reduce their HIV exposure.

Despite evidence pointing to their heightened vulnerability to HIV infection, the role of individual and collective resilience on HIV testing among African, Caribbean, and Black (ACB) heterosexual men in Canada is understudied.

Consequently, we sought to understand the role of ACB heterosexual men's individual and collective resilience—measured by the Baruth Protective Factors Inventory—on their uptake of HIV testing.

Our data are from the weSpeak study which included a cross-sectional survey of self-identified ACB heterosexual men in four Ontario cities, namely Ottawa, Toronto, London, and Windsor.

Guided by Andersen's behavioural model of health care utilization, we applied logistic regression to cross-sectional data and found that structural and personal protective factors are positively associated with HIV testing after accounting for a range of control variables (OR=1.03, $p<0.01$). This finding suggests that ACB men with higher levels of individual and collective resilience are more likely to have ever been tested for HIV than those with lower levels of resilience.

Based on this observation, we provide several suggestions for policymakers and future research. Particularly, it is essential for policymakers to design intervention programs that recognize and promote individual and collective resilience as a critical psychosocial resource that is useful for increasing the uptake of HIV testing among ACB men in the context of Ontario and Canada.

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220 COVID-Alerts: An Initiative to Address COVID-19 Misinformation Among the Sex Working Community partners in Nairobi, Kenya

Toby Le[1], Delories Sikuku[3,6], Joyce Adhiambo[4], Rosemary Kasiba[4], Lyle McKinnon[1,5], Keith Fowke[1,2,3,6]

[1]Medical Microbiology and Infectious Diseases at University of Manitoba, Winnipeg, Canada, [2]Community Health Science University at University of Manitoba, Winnipeg, Canada, [3]Medical Microbiology University of Nairobi, Nairobi, Kenya, [4]Sex Worker Outreach Program (SWOP), Nairobi, Kenya, [5]Centre for the AIDS Programme of Research in South Africa (CAPRISA), Durban, South Africa, [6]Partner for Health and Development in Africa, Nairobi, Kenya

Background: For over 35 years, researchers from the University of Manitoba have collaborated with the sex working (SW) community in Nairobi, Kenya to prevent and control HIV/STIs. This collaboration has led to the development of the peer engagement model where researchers and community leaders work together to disseminate key research findings to the wider community. During the COVID-19 pandemic, there has been global spread of misinformation resulting in mistrust and reduced compliance to public health measures. Unfortunately, this further elevates the risk of the SW community as many continue to provide in-person services to secure financial resources. To address this issue, an initiative called “COVID-Alerts” was developed to disseminate accurate information about COVID-19 via SMS to the SW community in Nairobi, Kenya.

Method: In August 2020, surveys were administered to all incoming clients at seven major health clinics in Nairobi, Kenya run by the Sex Work Outreach Programme (SWOP). The surveys were self-administered, available in both English and Swahili, with the following outcome measures: participants’ (1) access to communication devices, (2) preferred mode of communication, (3) and preference about receiving weekly updates about COVID-19.

Results: The survey was completed by 294 clients across all seven SWOP clinics. About 96% of survey respondents shared that they had access to a cell phone, of which 54.4% had access to smartphones, and 45.6% had non-smartphones. For mode of communication, majority of respondents preferred SMS/Text Message (75%), followed by WhatsApp (38%) and Facebook (13%). Finally, when asked if they would like to receive text updates about COVID-19, 83% of participants responded “yes”.

Conclusion: Given this acceptability, COVID-Alerts has since disseminated 15 text messages about COVID-19 to ~18,000 community members subscribed to the SWOP SMS broadcast system. This represents a way in which researchers can help provide accurate information to communities on the COVID-19 pandemic.

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221 Examining Healthcare Service Utilization Patterns of People Living with HIV in Rural British Columbia, Canada

Amanda Yonkman[1], Scott Emerson[1], Taylor McLinden[1], Paul Sereda[1], Rolando Barrios[1], Julio Montaner[1]
[1]BC Centre for Excellence in HIV/AIDS, Vancouver, Canada

Background
People living with HIV (PLWH) in rural areas face unique challenges when accessing healthcare services. Despite this, patterns of healthcare service usage in this population have not been fully explored. Using linked administrative health data, we examined differences in the healthcare service utilization patterns of rural and urban-dwelling PLWH in British Columbia (BC).

Methods
We analyzed 2,243,405 Medical Services Plan (MSP) claims reflecting physician visits from 11,196 PLWH in the Seek and Treat for Optimal Prevention (STOP) of HIV/AIDS Study. This analysis used population-based linkages of MSP claims from the BC Ministry of Health and clinical/treatment data from the BC Centre for Excellence in HIV/AIDS. We compared the frequency, physician specialty, and geographic location of services accessed by PLWH who lived in rural and urban settings between 1996 and 2017. Study participants were considered to be rural-dwelling if their home postal code's second digit was 0.

Results
Of the 11,196 PLWH, 5.7% lived in a rural area at least once during the study period, and 2.6% lived exclusively in rural areas. Urban-dwelling PLWH had, on average, more physician visits per year than those in rural areas (urban: 20.5 per year; rural: 16.6 per year). MSP claims reflecting specialist visits were less common among rural-dwelling PLWH (28.4% of visits for rural-dwelling PLWH and 37.4% for urban-dwelling). Rural-dwelling PLWH were also more likely to travel to different health service delivery areas (HSDA) for care; 54.2% of the physician visits among rural-dwelling PLWH occurred outside of their local HSDA, compared to 27.6% in the urban-dwelling population.

Conclusion
Rurality impacts healthcare service utilization patterns, including frequency of physician visits reflected in MSP claims, physician specialty, and whether a patient travels for care. Expanding upon this exploratory descriptive work is necessary to further characterize healthcare utilization of PLWH in rural areas in BC.

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222 Time until initiation of HIV care after an HIV+ test result recorded from 1997 to 2016 in British Columbia, Canada

Scott Emerson[1], Amanda Yonkman[1], Taylor McLinden[1], Paul Sereda[1], Rolando Barrios[1], Julio Montaner[1]
[1]BC Centre for Excellence In HIV/AIDS, Vancouver, Canada

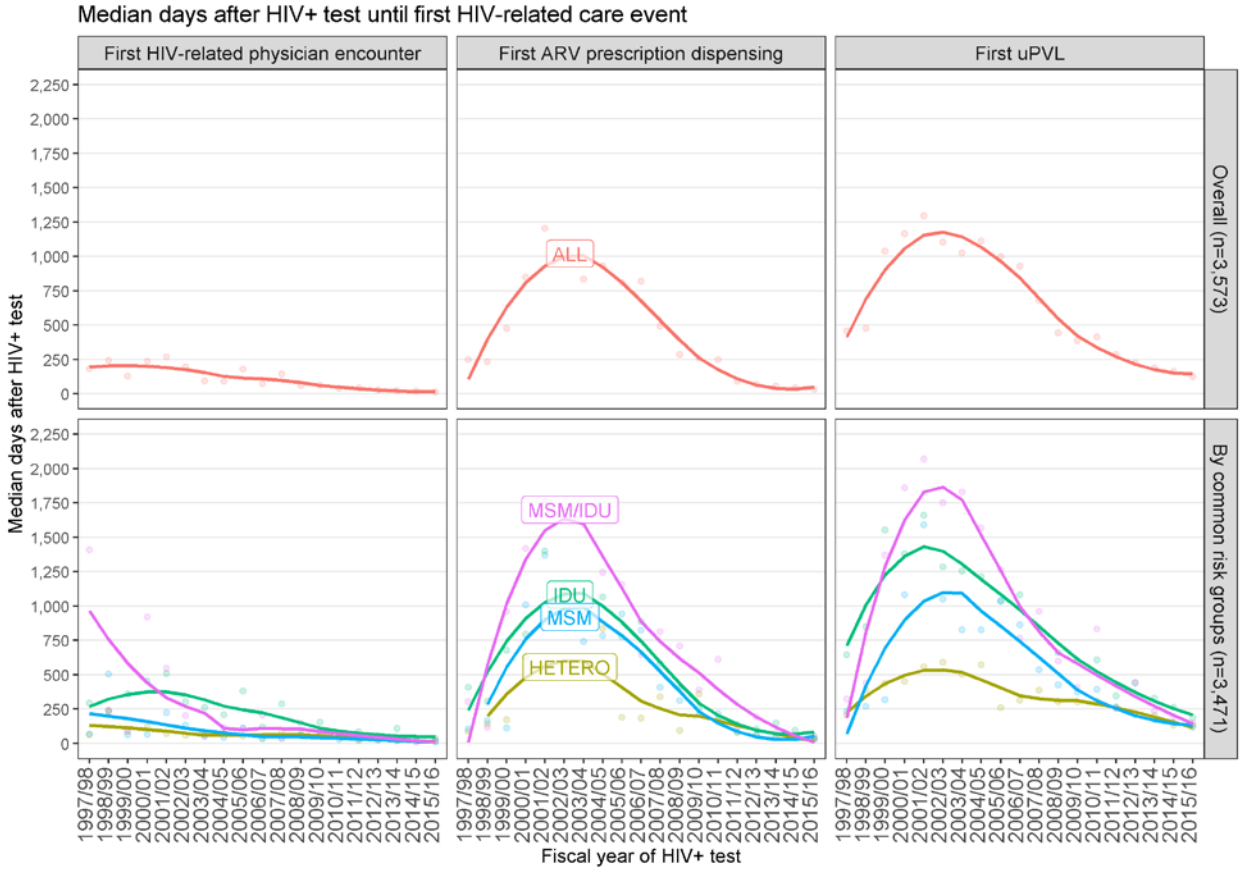
Background: Given changes in guidelines, practice, and other factors related to HIV care, understanding patterns in healthcare use after an HIV+ test result, a crucial period of care, is important. We examine trends in days until first HIV-related care events after an HIV+ test result.

Methods: The Seek and Treat for Optimal Prevention of HIV/AIDS (STOP) Study includes population-based linkages of clinical/treatment data from the BC Centre for Excellence in HIV/AIDS, HIV testing data from the BC Centre for Disease Control, and healthcare records from the BC Ministry of Health. We included persons residing in BC ≥1 year before and after their HIV+ test (n=3,698). We visualized longitudinal trends, overall and stratified by risk group, in median days until first: HIV-related physician encounter, antiretroviral (ARV) prescription dispensing, and undetectable plasma viral load (uPVL; using period-specific thresholds).

Results: For the period following an HIV+ test: median days (interquartile range, IQR) until first HIV-related physician encounter decreased steadily from 183 (IQR=1,454) in the 1997/98 fiscal year to 13 (IQR=27) in 2015/16. Median days until first ARV prescription dispensing increased initially from 247.5 (IQR=866) in 1997/98 up to 1204.5 (IQR=1866.5) in 2001/02, before steadily declining thereafter to 35 (IQR=41) in 2015/16; this is expected given changes in treatment guidelines/practices. Similar patterns were observed for uPVL. All trends were generally comparable across risk groups (Figure 1).

Conclusion: Descriptive analyses of population-based linked datasets allowed us to further characterize HIV care trajectories among people who recently tested positive for HIV across various treatment guideline eras.

Supporting Document



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224 Factors associated with uptake of HIV testing in Canada: A nationally representative study

Roger Antabe[1], Yujiro Sano
[1]*University Of Toronto Scarborough, Toronto, Canada*

Although HIV testing is essential for early detection and treatment of the virus, there are very few studies in Canada that explore the factors associated with the uptake of HIV testing at the national level. Using the 2015-16 Canadian Community Health Survey and applying logistic regression analysis, we examine the associations between HIV testing and factors identified by the Andersen's behavioural model of healthcare utilization.

We find that a range of predisposing, enabling, and need factors are significantly associated with HIV testing. For example, compared to the oldest respondents (i.e., 55-64), their younger counterparts (i.e., 45-54, 35-44, and 25-34) are more likely to have been tested for HIV.

Furthermore, formerly (OR=2.02, p<0.001) and never married (OR=1.67, p<0.001) respondents are more likely to have been tested for HIV than currently married ones. Also, women are more likely to have been tested for HIV than men (OR=1.13, p<0.001). Compared to those in Atlantic Canada, respondents in Quebec (OR=1.96, p<0.001), Ontario (OR=1.44, p<0.001), Prairies (OR=1.37, p<0.001), British Columbia (OR=1.99, p<0.001), and territories (OR=2.22, p<0.001) are all more likely to have been tested for HIV.

We also observe that respondents within higher income categories (i.e., $80,000 or more, $60,000-$79,999, $40,000-$59,999, $20,000-39,999) are all less likely to have been tested for HIV than those within the lowest category (i.e., less than $20,000). Finally, respondents who did not use condom during last sexual intercourse are more likely to have been tested for HIV than those who did (OR=1.42, p<0.001).

Based on these findings, we provide several important suggestions for policymakers and future research.

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227 PrEP Access in Canada During the COVID-19 Pandemic

Daniel Lazzam[1], Quinten Clarke[2], Nathan Lachowsky[3], Kevin Woodward[1]
[1]Mcmaster University, Hamilton, Canada, [2]University of British Columbia, Vancouver, Canada, [3]School of Public Health and Social Policy at the University of Victoria, Victoria, Canada

Objectives: COVID-19 and efforts to contain its spread have significantly impacted access to healthcare both in Canada and globally, with such barriers especially felt by marginalized communities such as members of the GBT2Q community and racialized populations. The initiation and promotion of PrEP, an extremely safe and effective means of preventing HIV transmission, has been hampered by many such barriers. Our study thus sought to investigate barriers to PrEP access during the COVID-19 pandemic through an intersectional lens, examining how racialization, location, and age affected healthcare access during COVID-19.

Methods: Our data was drawn from the SexNow survey, an initiative of the Community-Based Research Centre collecting quantitative health data on GBT2Q Canadians distributed electronically during the COVID-19 pandemic. We then analyzed variables relating to PrEP access, racialization, age, and location.

Results: Our analysis showed a variety of barriers to PrEP access during the COVID-19 pandemic, especially in situations requiring in person access to healthcare such as regular bloodwork. Several of these barriers also showed significant interactions with location, age, and racialization.

Conclusion: Overall, our results point towards the need for initiatives aimed at improving healthcare access for racialized individuals and marginalized groups, which the current pandemic has only made more imperative. It also demonstrates the benefits of existing policies aimed at improving PrEP affordability and access, while highlighting areas in need of improvement.

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228 Progress towards HCV Elimination Among HIV-HCV Co-infected Patients in the Canadian Co-infection Cohort (CCC)

Mariam El Sheikh[1,2], Curtis Cooper[3], Joseph Cox[1,2], John Gill[4], Valérie Martel-Laferrière[5], Marie-Louise Vachon[6], Marina Klein[1,2], Canadian Coinfection Cohort Study
[1]Department of Epidemiology, Biostatistics and Occupational Health, McGill University, Montreal, Canada, [2]Centre for Outcomes Research and Evaluation, McGill University Health Center-Research Institute, Montreal, Canada, [3]Department of Medicine, University of Ottawa, Ottawa, Canada, [4]Department of Medicine, University of Calgary, Calgary, Canada, [5]Department of Microbiology, Infectiology and Immunology, Université de Montréal, Montreal, Canada, [6]Centre Hospitalier Universitaire de Québec-Université Laval, Quebec, Canada

Background: WHO targets to eliminate HCV globally require that 50% of people living with HCV are treated by 2025 and 80% by 2030. People with HIV-HCV coinfection are an important population for HCV micro-elimination -they experience faster liver disease progression and most are already linked to care.

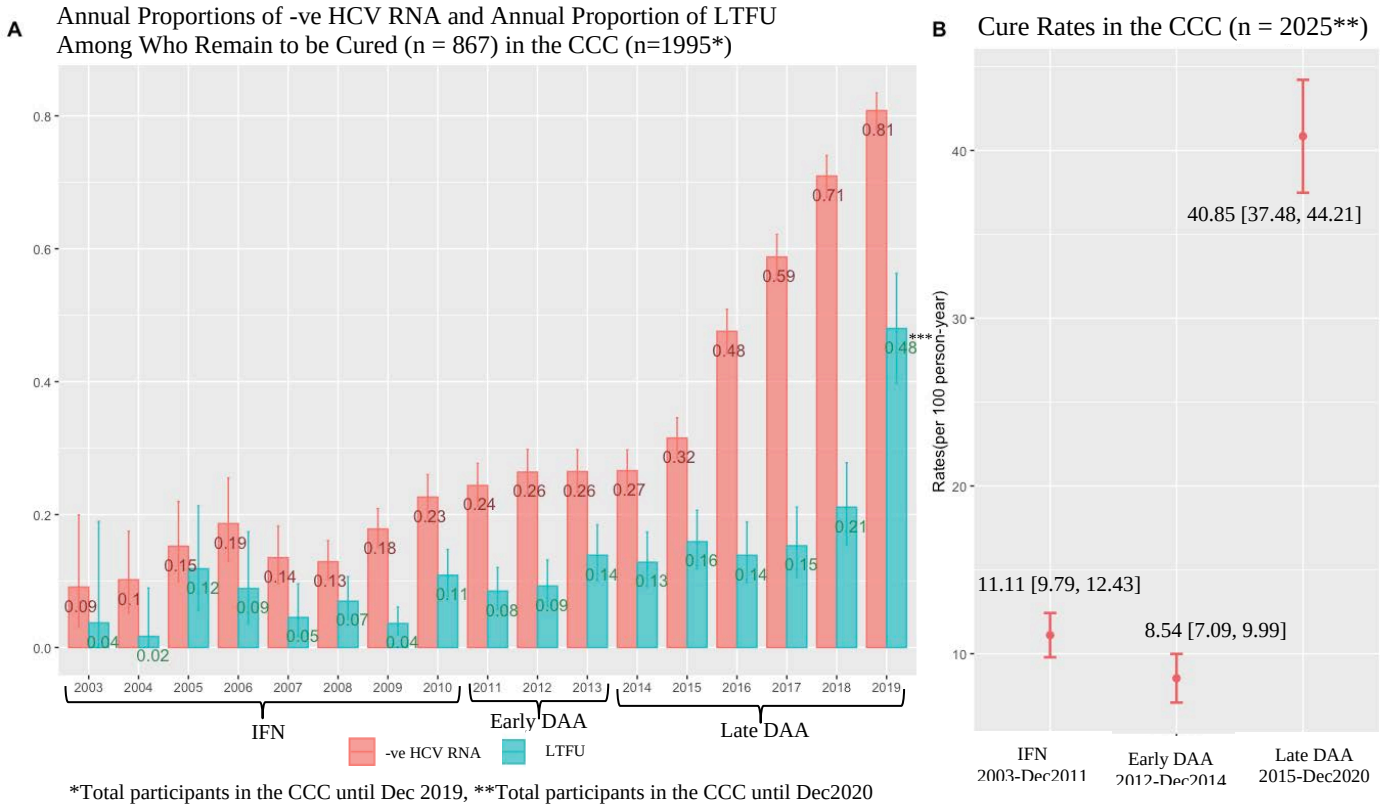
Methods: We assessed progress towards HCV elimination and examined characteristics of patients who remain uncured in the CCC, a multi-site open prospective cohort following HIV-HCV co-infected participants since 2003 from 18 sites in 6 provinces. For the population overall, by province, and priority population, we calculated annual proportions [95% CI] with negative HCV RNA, and cure rates stratified by treatment periods (interferon-based (IFN):2003-2011; early direct acting antivirals (DAA):2012-2014; late DAA:2015-2020).

Results: The annual proportion with negative HCV RNA increased in the late DAA period to 81[78,83]% overall (Fig.1A), across provinces (highest in QC:89[84,92]%, lowest in SK:66[57,74]%) and priority populations (highest among gay bisexual men who have sex with men:90[85,94]%, lowest among persons who actively inject drugs:64[58,70]%). Cure rates increased dramatically in the late DAA period (Fig.1B). Among participants who remain uncured, 49% were LTFU, of whom 81% had never initiated treatment.

Discussion: There has been a marked increase in cure rates across priority populations and geographic regions since the availability of DAAs in Canada suggesting that we may reach elimination targets among HIV-HCV co-infected persons linked to care. However, many are lost to follow-up prior to initiating treatment. Interventions to retain patients in care and ensure prompt treatment are needed to sustain elimination efforts.

Supporting Document

Figure 1: A) Annual proportions of -ve HCV RNA among all active participants (defined as participants with at least 1 visit during period of interest) (red) and Annual proportions of LTFU among those who remain uncured by the end of follow-up (# of LTFU during period of interest / # patients who remain uncured followed during period of interest), LTFU is defined as no visit for more than 18 months (green), whiskers represent 95% CI. B) Cure rates, cure defined as -ve HCV RNA after spontaneous clearance or treatment among all active participants (total number of cured patients / person-time of population at risk) stratified by treatment periods. Rates per 100 person-year, whiskers represent 95% CIs.



*Total participants in the CCC until Dec 2019, **Total participants in the CCC until Dec2020
***LTFU in 2019 is likely an overestimation because it is close to the end of follow-up period, thus, it is a combination of patients who we lost completely and patients who are just temporarily LTFU (those who have longer time between their visits, more than 18 months, and had we followed them for longer they wouldn't have been counted as LTFU). Additionally, COVID-19 pandemic started in Canada in the following 18 months which likely contributed to the overestimation of LTFU in 2019 due to delayed re-entry.

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245 Beliefs about Cervical Cancer Screening in Women living with HIV and Recency of Screening

Ashley Mah[1], Jennifer Gillis[2], Joanne Lindsay[1], Anita Benoit[3], Catharine Chambers[1,3], Claire Kendall[4], Abigail Kroch[5], Ramandip Grewal[1,3], Mona Loutfy[6], Kristen O'Brien[5], Gina Ogilvie[2], Janet Raboud[3], Anita Rachlis[7], Beth Rachlis[8], Anna Yeung[1], Mark Yudin[1], Ann Burchell[1]
[1]Unity Health Toronto , Toronto , Canada, [2]University of British Columbia, Vancouver, Canada, [3]University of Toronto , Toronto, Canada , [4]University of Ottawa , Ottawa, Canada, [5]Ontario HIV Treatment Network, Toronto , Canada , [6]Women's College Research Institute, Toronto, Canada, [7]Sunnybrook Health Sciences Centre , Toronto, Canada, [8]ICES , Toronto , Canada

INTRODUCTION: Women living with HIV are at higher risk for cervical cancer, such that timely screening is critical. Our aims were to examine beliefs towards cervical cancer screening according to the timing of the most recent Pap test among women living with HIV in Ontario.

METHODS: Between 2017-2020, the Ontario HIV Treatment Network Cohort Study, a multi-site clinical HIV cohort, administered a one-time questionnaire that assessed women's beliefs about cervical cancer screening. Beliefs were designed based on the Theory of Planned Behaviour. Agreement with each statement was assessed using a 5-point scale; responses were collapsed to represent disagreement, neutral/don't know and agreement with beliefs. Women were categorized as "up-to-date" on screening if they received a Pap test within the past 3 years vs "delayed/unscreened" if their last Pap test was more than 3 years ago, they were never screened, or the date was unknown.

RESULTS: Among the 512 women (mean age = 46 years), 56% were immigrants from a country where HIV is endemic and 87% reported an undetectable viral load. 85% of women reported being up-to-date on their cervical cancer screening. There were significant differences in beliefs by timeliness of screening (Table 1). Of note, 80.1% of up-to-date women agreed that their healthcare provider would recommend screening compared to 52.6% of those delayed/unscreened ($p<0.01$).

CONCLUSIONS: The findings highlight the importance of healthcare provider recommendation and availability of accessible and convenient screening options for women living with HIV, such as self-sampling for HPV testing as the primary screening test.

Supporting Document

Table 1. Beliefs regarding cervical cancer screening according to timeliness of self-reported most recent cervical cancer screening test.

Belief	Disagree	Neutral/Don't Know	Agree	Chi-Sq Test p-value
Behavioural Beliefs				
If cervical pre-cancer is found, I will be offered treatment				
Up-to-date	Not Shown[A]		94.0%	<0.01
Delayed/Unscreened	Not Shown[A]		77.6%	
I would (not) worry while waiting for my appointment for a Pap test or cervical swab*				
Up-to-date	19.4%	7.6%	72.9%	<0.01
Delayed/Unscreened	22.4%	19.7%	57.9%	
I have a (low) chance of getting unpleasant short-term side effects after a Pap Test*				
Up-to-date	22.2%	8.5%	69.3%	<0.01
Delayed/Unscreened	18.4%	22.4%	59.2%	
I will (not) feel embarrassed during the Pap test or cervical swab*				
Up-to-date	23.1%	8.1%	68.8%	<0.01
Delayed/Unscreened	23.7%	22.4%	53.9%	
I will (not) feel pain during the exam*				
Up-to-date	32.8%	10.4%	56.8%	<0.01
Delayed/Unscreened	28.9%	23.7%	47.4%	
I would (not) be worried that a Pap test or cervical swab would show something wrong*				
Up-to-date	40.0%	9.5%	50.5%	<0.01
Delayed/Unscreened	37.3%	25.3%	37.3%	
Control Beliefs				
I can find out where to go to get a Pap test or cervical swab for cervical cancer				
Up-to-date	4.2%	2.5%	93.3%	<0.01
Delayed/Unscreened	Not Shown[A]		80.0%	
It would (not) be difficult to take time away from family/work/responsibilities to get a Pap test*				
Up-to-date	6.7%	3.7%	89.6%	<0.01
Delayed/Unscreened	Not Shown[A]		75.0%	
I feel comfortable disclosing my HIV status to the healthcare provider doing the exam				
Up-to-date	18.8%	9.7%	71.5%	0.08
Delayed/Unscreened	17.1%	18.4%	64.5%	
It would be easier for me to get the exam done by a female healthcare provider				
Up-to-date	21.9%	23.1%	55.0%	0.04
Delayed/Unscreened	Not Shown[A]		53.9%	
It would be easier for me to get the exam done by a male healthcare provider				
Up-to-date	65.7%	28.2%	6.0%	0.26
Delayed/Unscreened	61.8%	Not Shown[A]		
Subjective Beliefs				
Those who are important to me would encourage me to get a Pap test				
Up-to-date	8.5%	9.0%	82.4%	0.06
Delayed/Unscreened	Not Shown[A]		72.0%	
My healthcare provider thinks that I should get a Pap test for cervical cancer				
Up-to-date	14.1%	5.8%	80.1%	<0.01
Delayed/Unscreened	25.0%	22.4%	52.6%	

[A]Represents cells that were suppressed due to small cell size
*Denotes statements that were altered during analysis to represent positive attitudes towards screening; bracketed words for starred statements were added for clarification

251 Changes in HIV and Sexually Transmitted Infection Diagnoses during the COVID-19 Pandemic in Alberta

Daniel Levin[1], Caley Shukalek[2]
[1]*Department of Medicine, Cumming School of Medicine, University of Calgary, Calgary, Canada,*
[2]*Department of Medicine and Community Health Sciences, Cumming School of Medicine, University of Calgary, Calgary, Canada*

Background: Sexually transmitted infections (STIs) are an ever-present public health issue in Canada that has been greatly affected by the COVID-19 pandemic, including both diagnosis and treatment delays. Since the pandemic and compared to 2019, Alberta reported a decrease in rates of chlamydia, gonorrhea, and HIV in 2020, yet rates of syphilis increased by 7.5%. While informative, these rates do not account for demographic factors including age, sex, geographic setting, COVID-19 vaccination/infection and use of other medications, like pre-exposure HIV prophylaxis (PrEP)that has been associated with increased rates of STI acquisition among men who have sex with men.

Objectives: The aim of this study is to (1) determine and compare the testing and diagnosis rates of STIs among various subgroups of adults in Alberta throughout the COVID-19 pandemic when compared to the 5 previous years and (2) comment on how PrEP use, prior COVID-19 infection and COVID-19 vaccination may be influencing these trends.

Methods: A retrospective, population-based cohort study using de-identified administrative data will be undertaken to assess how STI rates among specific demographicshave changed due to the COVID-19 pandemic. Data from all adult patients tested for a STI (Syphilis, Gonorrhea, Chlamydia, Trichomoniasis or HIV) in the province of Alberta between 2020-Mar-01 and 2021-Oct-30 will be utilized to determine if rates of STI diagnosis were impacted by patient demographics. Data analysis will include descriptive statistics assessment for significant changes in STI testing positivity and incidence rates among patient-level demographics using chi-squared testing and ANOVA. Relative risks of contracting STIs will be determined among demographic subgroups listed above, and linear regression will be used to compare estimated STI rates for 2019-2020 to historical rates.

Conflict of Interest: CS has received speaker and advisory committee honorariums and has research funding from Gilead Sciences and Merck Canada Inc unrelated to this work.

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271 Mail-Home Dried Blood Spot Self-Collection for HIV, Hepatitis C, and Syphilis Screening: A Pilot Study Among Gay, Bisexual, Trans, Two-Spirit, and Queer Men and Non-Binary People (GBT2Q) in British Columbia

Nathan Lachowsky[1,2], Ben Klassen[2], Kiffer Card[2,3], Robert Higgins[1,2], Chris Draenos[2], Kai Jacobsen[1], Mark Hull[4], Stephanie Lavoie[5], John Kim[5]
[1]School of Public Health & Social Policy, University Of Victoria, Victoria, Canada, [2]Community Based Research Centre, Vancouver, Canada, [3]Faculty of Health Sciences, Simon Fraser University, Burnaby, Canada, [4]Faculty of Medicine, University of British Columbia, Vancouver, Canada, [5]Public Health Agency of Canada, Winnipeg, Canada

Background: GBT2Q are disproportionately affected by HIV, Hepatitis C Virus (HCV), and syphilis. COVID-19 has exacerbated barriers to in-person testing. We implemented and evaluated a mail-home dried blood spot (DBS) self-collection pilot intervention for HIV, HCV, and syphilis screening among GBT2Q aged 18+ in British Columbia.

Method: Participants were recruited via social media, socio-sexual websites/apps, and via community-based agencies from 10/2019-02/2020. Participants self-completed an online questionnaire on demographics, sexual behaviours, and sexual health. Participants could opt-in to learn more about the pilot. Consenting participants were mailed a DBS self-collection kit. DBS were screened at the Public Health Agency of Canada. Interested participants received their results with appropriate linkage to care. Bivariate logistic regression identified factors significantly ($p<0.05$) associated with: interest in the pilot (versus not), consent to participate (versus not), and return of DBS (versus not).

Results: Of 1442 participants, 52% (752/1442) wanted to learn about the pilot, 83% (622/752) consented to participate, 74% (458/622) received a self-collection kit, and 50% (229/458) returned their DBS. Shipping issues included incomplete mailing addresses (n=105) and inability to deliver by shipper (n=59). Laboratory screening could be completed on 97.3% of DBS. Overall, 91% had a good overall experience, 89% would use at-home DBS again, and 94% would recommend it to others. GBT2Q interested in the pilot were more likely to be people of colour, international students, transgender, financially strained, report transactional sex, use substances, and report more new sex partners. Few differences existed between those who consented (versus not) and returned DBS (versus not). However, GBT2Q who were bisexual, less out, less educated, and reported transactional sex were less likely to return DBS.

Conclusions: Mail-home DBS self-collection reached key sub-groups of GBT2Q, was highly acceptable, and DBS specimen quality was excellent. This promising intervention should be evaluated in other priority populations.

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273 People Living with HIV in Stop the Spread Ottawa: Immune Response to SARS-CoV-2 Vaccination

Erin Collins[1,2], Yannick Galipeau[2], Angela Crawley[1,2], Julian Little[2], Raphael Saginur[1], Ronald Booth[2,3], Marc-André Langlois[2], Curtis Cooper[1,2]
[1]Ottawa Hospital Research Insitute, Ottawa, Canada, [2]University of Ottawa, Ottawa, Canada, [3]Eastern Ontario Regional Laboratory Association (EORLA), Ottawa, Canada

Background: Data on SARS-CoV-2 vaccine immunogenicity in people living with HIV (PLWH) remains sparse. Stop the Spread Ottawa (SSO) is a 1000-member cohort study on SARS-CoV-2 immune response in participants at risk of exposure and/or severe disease. PLWH comprise an important subgroup.

Methods: Blood was collected from all participants at baseline for serum and PBMC isolation. Questionnaires are completed at baseline, 3 and 10 months post-baseline. Participants submit monthly dried blood spots for serology surveillance and saliva/sputum samples for viral RNA testing. Approximately 500 participants with history of SARS-Cov-2 infection and/or vaccination also attend monthly blood draws. 300 participants will extend participation by an additional 24 months. Participant recruitment began in October 2020. Results are described up to December 2021.

Results: As of December 2021, SSO has recruited 1032 individuals. Participants living with HIV (n=31) have a median age of 60 (IQR=10.8, range 32-71) and 87.1% are male. Median length of years living with HIV is 15 (IQR=19, range 5-40). 100% are currently treated with antiretroviral medications and 96.8% (n=30) report a fully suppressed viral load. 12.9% (n=4) are current smokers, 9.7% (n=3) are overweight. The study team will present a descriptive analysis of the PLWH subgroup. Pending availability of post-vaccine SARS-CoV-2 serosurveillance results, signal-to-cut-off (S/CO) ratios and binding antibody units (BAU) will be compared between SSO PLWH and healthcare worker/control (n>400) subgroups.

Discussion: This longitudinal cohort study has enabled serial collection of specimens for SARS-CoV-2 testing from a diverse range of participants. The 24-month study extension will maximize opportunities to track SARS-CoV-2 immune and vaccine efficacy, and detect and characterize emerging variants among PLWH and other high priority subgroups.

278 Prevalence of and Factors Associated with HIV Testing and HIV Positive Serostatus among Quebec's Lesbian, Gay, Bisexual, Trans, Queer, and Two-Spirit (LGBTQ2+) persons: Results from the UNIE-LGBTQ Project

Martin Blais[1], Mathieu Philibert[1], Mariia Samoïlenko[1], Michele Baiocco[1], Isabel Côté[2]
[1]Université du Québec à Montréal, Montréal, Canada, [2]Université du Québec en Outaouais, Gatineau, Canada

Background: This study examines the socio-demographic correlates of lifetime HIV testing and HIV positive serostatus across a large, diversified sample of LGBTQ2+ persons in Quebec.

Method: We ran an online survey from September 2019 to August 2020 in Quebec. Inclusion criteria were self-identifying as LGBTQ2+, understanding French or English, being ≥ 18 years old, and living in the province of Quebec. The analytical sample is composed of 3,282 LGBTQ2+ participants. Adjusted odd ratios (aOR) were estimated using Firth's logistic regression to compare lifetime HIV testing and HIV positive serostatus across sociodemographic characteristics (gender, age, ethnicity, education, income, residential area).

Results: About 42% of the sample had never been tested for HIV. Lifetime HIV testing (58%) was lower among cisgender LGBQ+ women (aOR=0.18, 95%CI=0.15-0.22), trans women and transfeminine nonbinary persons (aOR=0.57, 95%CI: 0.38-0.83), as well as transmasculine nonbinary persons (aOR=0.26, 95%CI: 0.20-0.35) compared to cisgender GBQ+ men. It was also lower among those living in rural regions compared to those living in the greater Montreal region (aOR=0.72, 95%CI: 0.54-0.95). Lifetime HIV testing was more likely among participants born before 1991 (aOR from 2.06, 95%CI: 1.56-2.73 to 3.27, 95%CI=2.45-4.36) and among those with a university degree compared to lower education (aOR=1.88, 95%CI: 1.58-2.23). Income and BIPOC status were not associated with lifetime HIV testing. Overall HIV prevalence was 4.9% (95%CI: 4.0-6.1), with cisgender GBQ+ men (8.3%, 95%CI: 6.7-9.8) and trans women and transfeminine nonbinary participants (3.6%, 95%CI: 0.9-7.5) reporting the highest prevalence rates. HIV prevalence was also higher among those born before 1981 (aOR from 4.64, 95%CI: 1.70-12.66 to 8.84, 95%CI=3.48-22.47). Education, income, BIPOC status, and residential area were not associated with HIV positive serostatus.

Conclusion: These results highlight the importance of promoting adaptive HIV testing across multiple gender identities and modalities, as well as among younger generations and rural residential areas.

284 Screening for Fraudulent Responses in a Web-Based Survey on Sexual Orientation Disclosure in Healthcare

Robinson Truong[1,2], David Brennan[3], Ann Burchell[1,4], Ross Upshur[2,4], Darrell Tan[1,2,5,6]
[1]MAP Centre for Urban Health Solutions, St. Michael's Hospital, Unity Health Toronto, Toronto, Canada, [2]Institute of Medical Science, University of Toronto, Toronto, Canada, [3]Factor-Inwentash Faculty of Social Work, University of Toronto, Toronto, Canada, [4]Dalla Lana School of Public Health, University of Toronto, Toronto, Canada, [5]Division of Infectious Diseases, St. Michael's Hospital, Unity Health Toronto, Toronto, Canada, [6]Department of Medicine, St. Michael's Hospital, Unity Health Toronto, Toronto, Canada

Background: Fraudulent data can jeopardize the validity of web-based HIV research. We describe a multi-pronged approach to removing fraudulent responses from a cross-sectional online survey about sexual orientation disclosure in primary care.

Methods: We used the Hosted-in-Canada web-platform and recruited participants via sexual networking applications and community-based organizations. A literature review identified 10 potential fraud-detection criteria. Participant paradata (behaviour) criteria: duplicated IP addresses, short survey completion time, and identical survey start/end times. Participant response criteria: anti-fraud questions pertaining to 1) embedded directives (i.e. "Select the fifth option…", 2) community knowledge (i.e. "When is Pride month in Ontario?..." and 3) honeypot questions that only bots can visually see. We also assessed straightlining (i.e. repeated responses) on open-ended questions. Assuming IP address duplication is the most reliable criterion, we calculated tetrachoric correlation coefficients between this and other criteria. Assuming internal data consistency would improve with removal of fraudulent responses, we calculated Cronbach's alpha for the 10-item Nebraska Outness Scale, after removing responses meeting each criterion.

Results: Of 1407 responses, 1006 were suspected to be fraudulent. Most criteria had positive weak associations to the IP address criterion (rtet) and produced improved internal consistency (α after criterion applied). Honeypot questions failed to identify any fraudulent responses. Ultimately, five criteria were applied sequentially: duplicated IP addresses, identical start/end times, completion time <10-minutes, anti-fraud questions and straightlining, yielding 401 retained responses with good internal consistency (α=0.836).

Conclusion: Paradata, anti-fraud questions and serial assessment of internal consistency are useful ways to remove fraudulent data from web-based surveys

Supporting Document

Table 1: Screening for Fraudulent Responses

Criteria	n that met criterion	r_{tet}[a]	α after criterion applied	Overall n after applying criterion sequentially[b]	α after applying criterion sequentially
No criteria applied	NA	NA	NA	NA	0.743
1) Screening of paradata					
IP addresses are duplicated[a]	276	N/A	0.728	1131	0.728
Criteria based on survey start and end time					
Start time of survey were duplicated	763	0.183	0.836	N/A	N/A
End time of survey were duplicated	790	0.205	0.836	N/A	N/A
Start or end time of survey were duplicated	848	0.149	0.841	N/A	N/A
Start and end time of survey were duplicated	705	0.239	0.832	598	0.827
Criteria based on survey completion time					
Survey completion time <5 minutes	246	0.310	0.770	N/A	N/A
Survey completion time <10 minutes	630	0.316	0.795	429	0.833
Survey completion time <15 minutes	916	0.284	0.774	N/A	N/A
2) Screening of responses					
Responses removed due to incorrectly answered anti-fraud survey items	78	0.0233	0.747	403	0.835
Straightlining on at least half of the open-ended questions	70	0.6222	0.719	401	0.836

[a]Tetrachoric correlation coefficients for each criterion was calculated in comparison to the IP address duplication criterion

[b]Selection of criteria for sequential removal was based on highest tetrachoric correlation coefficients per criteria group

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286 The Care Continuum Across HIV Clinics in Saskatoon, SK: Insights, Impacts, and Opportunities of the COVID-19 Pandemic

Cara Spence[1,2], Steven Sanche[1,3], Beverly Wudel[1,3], Siddharth Kogilwaimath[1,3], Larissa Kiesman[4], Marina Klein[2]
[1]University Of Saskatchewan, Saskatoon, Canada, [2]McGill University, Montreal, Canada, [3]Saskatchewan Health Region, Saskatoon, Canada, [4]Westside Community Clinic, Saskatoon, Canada

Background: Saskatchewan has a unique HIV epidemic in Canada, driven largely by injection drug use, and steps are being undertaken to better understand our care cascade. HIV care in Saskatoon is primarily accessed at the Royal University Hospital (RUH) and the Westside Community Clinic (WSCC). While the clinic at RUH is a specialized Infectious Diseases clinic, WSCC provides community-based access to primary care, HIV and addictions care. These clinics cater to over 1100 persons living with HIV. With complementary, yet different, care models, the HIV care continuums of the clinics offer insights into each of the care models, and exemplify the impact and opportunities created by the COVID-19 pandemic.

Data: Cascade of care data is presented and compared for three timepoints: 2019, 2020, 2021 across two sites: PLP and WSCC. The care continuum data demonstrates where gaps in care are most prevalent before and during the COVID-19 pandemic.

Findings: The strengths and limitations of each of the care models in retaining patients into care and ultimately supporting viral suppression is evident. Access to care during the COVID-19 period has been relatively undisrupted in the community-based care model, while adversely impacting the care offered by hospital-based clinic. The rates of virologic suppression are noted to be lowest during the peak period of the pandemic lockdown in May, 2020 for both clinic sites.

Significance: Gaps in the care continuum exacerbated by the pandemic offer an opportunity for clinics in Saskatoon to advocate for integrated and outreach services to better support access and engagement in care for a large cohort of persons living with HIV seeking care in Saskatoon.

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294 Patterns of hospitalizations among people living with HIV in British Columbia who have experienced violence

Charity Mudhikwa[1], Robert Hogg[1,2], Carly Marshall[2], Monica Ye[2], Kate Salters[1,2], Surita Parashar[1,2], Kalysha Closson[3]
[1]Simon Fraser University, Burnaby, Canada, [2]BC Centre for Excellence in HIV/AIDS, Vancouver, Canada, [3]University of British Columbia, Vancouver, Canada

Background: People living with HIV (PLWH) experience disproportionate violence-related burdens which have important implications for healthcare utilization. This study aims to understand the association between recency of violence and rate of hospitalizations among PLWH in British Columbia (BC).

Methods: We analysed cross-sectional survey data from the Longitudinal Investigation into Supportive and Ancillary Health Services study (LISA) of PLWH ≥19 years old in BC (2007-2010). LISA participants reported if they had experienced any kind of violence recently (in the 6 months prior to interview [p6m]), in the past [>p6m] or never. Unadjusted and adjusted Poisson regression examined the independent association between recency of violence and rate of hospitalization p6m using linked administrative health data, and adjusting for potential confounders. Potential confounders were selected based on the magnitude of change in the violence coefficient.

Results: Of 985 participants (74.7% men, median age 45), 25.3% never experienced violence, 59.9% experienced violence p6m, and 14.8% experienced violence >p6m. In the p6m, 207 (21%) were hospitalized, with 329 total hospitalizations. In the adjusted model (see table), participants with past (Rate Ratio: 1.41; 95%CI 1.05-1.89) but not recent violence had significantly higher rates of hospitalization than those who had never experienced violence.

Conclusion: The rate of hospitalization was significantly elevated among PLWH who had experienced past violence. This may be due to long-term complications resulting from past physical and emotional trauma in addition to potentially improved access and utilization of healthcare services after exiting violent environments.

Supporting Document

Table: Univariable and multivariable Poisson regression modelling the rate of hospitalization

Univariable				Multivariable*		
	Rate Ratio	95% CI		Rate Ratio	95% CI	
Main Exposure: violence status						
Never [ref]	1.00			1.00		
Recent	1.43	0.99	2.08	1.09	0.74	1.60
Past	1.51	1.14	2.00	1.41	1.05	1.89
Potential Confounders						
Ethnicity						
White [ref]	1.00					
Indigenous	1.26	1.00	1.59	**Not Selected**		
Other	0.60	0.36	1.02			
Stable Housing						
No [ref]	1.00			1.00		
Yes	0.54	0.43	0.67	0.62	0.49	0.79
Street drug use						
Never [ref]	1.00			1.00		
Previous	1.44	1.03	2.02	1.20	0.85	1.69
Recent	2.11	1.55	2.88	1.56	1.10	2.19
Education						
High school or more [ref]	1.00					
Some high school or less	1.58	1.27	1.96	**Not Selected**		
Current Employment						
No [ref]	1.00					
Yes	0.44	0.32	0.61	**Not Selected**		
Annual earnings						
>= $15000 [ref]	1.00					
<$15000	2.13	1.66	2.75	**Not Selected**		
Relationship type						
Common law/legally married/non-regular partner/regular partner [ref]	1.00					
Divorced/separated/single/widowed/other	1.43	1.13	1.81	**Not Selected**		
Adherence in first year prior to the interview						
>=95 [ref]	1.00					
<95	2.49	1.90	3.27	**Not Selected**		
Unknown	2.40	1.78	3.22			
Mental disorder						
No [ref]	1.00			1.00		
Yes	1.40	1.10	1.77	1.25	0.98	1.59
Age (10 years increase)	0.80					

*Selection criteria described in methods above
NB: Sexual orientation and gender were also considered in the analysis, but the interaction was not statistically significant

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295 Exploring Service Delivery for Gay, Bisexual, Trans, and Other Men Who Have Sex with Men in AIDS Service Organizations in Southwestern Ontario, Canada

Todd Coleman[1], **Lucas Gergyek**[2], Mahad Shahid[1]
[1]Department of Health Sciences - Wilfrid Laurier University, Waterloo, Canada, [2]Department of Psychology - Wilfrid Laurier University, Waterloo, Canada

Background: Gay, bisexual, trans, and other men who have sex with men (GBTMSM) experience higher rates of adverse health outcomes (e.g., HIV, mental health concerns, and access to services) compared to heterosexual/cisgender counterparts. A large proportion of Canadian studies on GBTMSM communities rely on samples obtained from larger metropolitan regions, which do not reflect lived experiences of these communities across Canada's vast geography. AIDS service organizations (ASOs) serving these communities outside of metropolitan regions often rely on these studies despite them not being relevant to the populations/communities they serve. This research aims to characterize service delivery, region-specific nuances, and facilitators/barriers to implementing knowledge uptake for GBTMSM within ASO catchment areas in Southwestern Ontario.

Method: As part of a larger multi-phase project, this study involved exploring current and past approaches to GBTMSM health promotion and prevention programming within ASOs. This was done through semi-structured interviews (n=14) with leaders and GBTMSM sexual health workers within six ASOs in Southwestern Ontario. Transcribed interviews were analyzed using NVIVO software. A code report was generated, thematically capturing commonalities and differences across regions.

Results: Four larger global themes emerged: 1) Organizational and sector characteristics (e.g., funding; sector-specific issues; the evolution of the sector); 2) Data and informational availability and utility (e.g., region-specific availability of data; quality of data, including ability to explore data intersectionally); 3) Outreach and engagement with GBTMSM (e.g., connecting with local GBTMSM; COVID-19-related challenges; innovations in outreach); and 4) Sexual health and broader health of GBTMSM (e.g., stigma, discrimination, and violence; sexual education; COVID-19 and well-being; community connection and cohesion).

Conclusions: Findings have implications for local service delivery. Next steps include ongoing discussions with ASO representatives about themes; interviewing GBTMSM directly; collecting quantitative data; and using several data sources to holistically inform future service provision for GBTMSM in Southwestern Ontario.

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297 Conceptual Development of a Motivational Interviewing-Based Smartphone App to Address COVID-19 Vaccine Hesitancy

Joseph Roy Gillis[1], Mohamed Al-Refae[1], Amr Al-Refae[1], Ishtiaque Ahmed[1], Maryam Mokhberi[1]
[1]*University Of Toronto, Toronto, Canada*

Vaccine hesitancy is a normal phenomenon experienced by many that refers to a state of uncertainty towards vaccines despite their availability. With the rise of the COVID-19 pandemic, a multitude of vaccines have been developed with the collaboration of scientists around the world.

Despite the reported high efficacy and marginal side effects of these vaccines, a huge number of individuals are still vaccine-hesitant. While a huge proportion of Canadians are fully vaccinated, several Canadians and other populations around the world have yet to be vaccinated which can sustain the community spread of the virus over a longer period and result in mutations that may promote the rise of new variants of concern. Resulting mental and physical health challenges have surfaced due to the pandemic and have been compounded by isolation, quarantine, and lockdown measures.

We conceptualize a smartphone application that incorporates an approach utilized in various counselling approaches and healthcare settings called Motivational Interviewing (MI) which may be more beneficial in promoting vaccine uptake than traditional approaches. MI, a guiding and collaborative approach, can be used to tackle various COVID-19 related issues that sustain and promote vaccine hesitancy such as misinformation related to the pandemic and vaccine, concerns about the speed of the development of vaccines, and their long-term side effects, and needle phobia.

The smartphone app will employ a hybrid deterministic/conversational artificial-intelligence-based approach that will mimic a realistic MI session as opposed to the frequently used chatbot approaches. This approach incorporates the ask-offer-ask and decisional balance frameworks which are employed during MI to promote change talk and guide one’s decision-making through personal autonomy. Due to the nature of the pandemic, a virtual approach through a smartphone app has the possibility of being deployed on a national and international level to address COVID-19 vaccine hesitancy.

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300 Social contextual factors associated with lifetime HIV testing among the Tushirikiane urban refugee youth cohort in Kampala, Uganda: cross-sectional findings

Miranda Loutet[1], Carmen Logie[2], Isha Berry[1], Moses Okumu[3], Robert Hakiza[4], Daniel Kibuuka Musoke[5], Simon Mwima[6], Peter Kyambadde[7,8]
[1]Dalla Lana School of Public Health, University Of Toronto, Toronto, Canada, [2]Factor-Inwentash Faculty of Social Work, University of Toronto, Toronto, Canada, [3]School of Social Work, University of North Carolina Chapel Hill, Chapel Hill, United States of America, [4]Young African Refugees for Integral Development , Kampala, Uganda, [5]International Research Consortium, Kampala, Uganda, [6]Uganda Ministry of Health, Kampala, Uganda, [7]National AIDS Coordinating Program, Kampala, Uganda, [8]Most at Risk Population Initiative , Kampala, Uganda

Background: Urban refugee youth—understudied in HIV research—may live in social contexts characterized by structural drivers of HIV such as poverty and violence. In Uganda, which hosts more than 1.4 million refugees, nearly one-quarter are youth and over 90 thousand live within informal settlements in urban areas where social environments are shaped by economic insecurity, overcrowding, and elevated violence. This study examined social contextual factors associated with lifetime HIV testing among urban refugee youth in Kampala, Uganda.

Methods: We analyzed baseline data from a peer-recruited cohort of urban refugee youth aged 16-24 years living in Kampala's informal settlements enrolled between February and March 2020. We conducted descriptive statistics and logistic regression to examine socio-demographic (e.g., age, gender), material (e.g., income insecurity, education, employment), relational (e.g., having children, social support), and symbolic contexts (e.g., HIV-related stigma, intimate partner violence) associated with lifetime HIV testing.

Results: A total of 450 urban refugees were included. The mean age was 20.4 years (standard deviation: 2.4 years), most participants lived in Uganda for 1-5 years (53.2%), and just over half the participants identified as cisgender men (50.7%), and half as cisgender women (48.7%), with a small proportion identifying as transgender (0.7%). Overall, less than half reported lifetime HIV testing (43.4%). In multivariable analyses, odds of lifetime HIV testing were higher among youth with secondary school education or higher (adjusted odds ratio [aOR]: 2.30, 95% confidence interval [CI]: 1.27-4.17), currently employed (aOR: 1.79, 95%CI: 1.03-3.10), and reporting physical intimate partner violence (aOR: 3.61, 95%CI: 1.43-9.10). Having children was marginally associated with HIV testing (aOR: 2.17, 95%CI: 0.98-4.81, p=0.052).

Conclusion: Findings demonstrate suboptimal HIV testing and the need to meaningfully engage urban refugee youth to create enabling environments for sexual health. Advancing this understanding of social contextual factors can inform targeted HIV testing initiatives.

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306 The GetaKit Study: Implementing Targeted HIV Self-Testing in Ontario

Patrick O'byrne[1], Alexandra Musten[2], Lauren Orser[1], Nikki Ho[1], Abigail Kroch[2], Jennifer Lindsay[1]
[1]University Of Ottawa, Ottawa, Canada, [2]Ontario HIV Treatment Network, Toronto, Canada

In preparation for Health Canada's approval of Canada's first HIV self-test in November 2020, a pilot study was implemented in Ottawa from July 20, 2020 to March 31, 2021 to offer free self-test kits and linkage to care (GetaKit). On April 1, 2021, we began expanding GetaKit across Ontario through AIDS Service Organizations which predominantly serve HIV priority populations; i.e., gay, bisexual, and other men who have sex with men (gbMSM); persons who are trans; Indigenous Peoples; African, Caribbean, or Black people (ACB); and people who use drugs (PWUD).

GetaKit functions by having participants register and complete a sexual health self-assessment, which determines eligibility for HIV testing based on current provincial and federal HIV testing guidelines. Those deemed eligible can order a free HIV self-test to be delivered by mail or obtained via curbside pick-up at one of over a dozen locations across Ontario. Participants are requested to report their result to GetaKit and are linked to prevention and HIV care if necessary.

From April 1, 2021 to December 14, 2021, there were 1665 requests for kits, of which 1248 (90%) were eligible. Notably, 990 (80% of eligible requests) were from members or priority populations: 26% were ACB, 67% gbMSM, 2% Indigenous, 10% PWUD, and 10% trans. As well, 26% of participants who belonged to HIV priority groups reported no prior HIV testing. For self-test results, 38% were not reported, 39% were negative, 1% were 'prefer not to report', and 0.5% (n=6) were positive. All participants with positive results underwent confirmatory testing; five were confirmed and 1 was determined to be a false positive self-test.

These results suggest that GetaKit, through its partnership with ASOs and during the COVID pandemic, provides appropriate HIV testing to members of HIV priority populations, to first-time testers, and to persons with undiagnosed HIV.

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4 Promising Practices for Harm Reduction in the Context of Multiple Pandemics: Results of the Manitoba Harm Reduction Network Evaluation

Susan Taylor[1]
[1]*National Collaborating Centre for Infectious Diseases, University of Manitoba, Winnipeg, Canada*

Extensive public health resources have been directed to the COVID-19 pandemic. This focus has saved lives; it has also reduced attention paid to epidemics of sexually transmitted and blood-borne infections (STBBI) and the overdose crisis. Intersections between these crises and the pandemic have manifested as a syndemic, a clustering of health and social conditions that has worsened outcomes for people who use substances (PWUS).

The Manitoba Harm Reduction Network (MHRN) works towards equitable access to harm reduction supplies, reducing the transmission of STBBIs, and systemic social change. In summer 2021, a participatory evaluation of services was conducted with PWUS, MHRN staff, an Elder, and NCCID staff. The evaluation aimed to identify transferrable promising practices for harm reduction in the context of the pandemic.

The evaluation showed that the pandemic resulted in significant increases in houselessness, loss of income and disability/EI benefits, and serious negative mental health effects for PWUS. Shortages of preferred substances, and higher risk substance use, were common. All participants had been affected by overdoses during the pandemic. PWUS were disproportionately impacted by the shift to virtual and teleservices, the lack of walk-in appointments, and redeployment of STBBI nurses. Every participating PWUS reported challenges getting STBBI care; they also reported decreased access to harm reduction services and safe medical care for other conditions during the pandemic.

However, the evaluation also pointed to promising practices that can improve the lives of PWUS and reduce the transmission of STBBI. Incremental promising practices include: peer-led overdose prevention and response initiatives, locker programs for contact-free delivery of supplies, targeted provision of essentials, and provision of telephones to facilitate medical care. Other promising practices are structural in nature, including: increasing the surge capacity of the healthcare system, improving practitioner education about harm reduction, and facilitating the presence of advocates for PWUS.

6 Public Health Challenges, Opportunities and Success In Addressing HIV And Complex Health Issues In Persons Who Use Drugs (PWUD) in Middlesex-London, Ontario

Shaya Dhinsa[1]
[1]*Middlesex London Health Unit, London, Canada*

In June 2016, MLHU issued a public health alert related to rapidly increasing rates of HIV, hepatitis C, invasive Group A Streptococcal (iGAS) disease, and infective endocarditis among people who inject drugs (PWID). Prior to 2014, the Middlesex-London area identified an average of 25 new cases of HIV annually. However, by the end of 2016, the total number of new cases of HIV reported that year had climbed to 61—the highest number of new cases that Middlesex-London has seen in a single year.

In response, local stakeholders and more than fifty provincial and national experts were consulted and a local HIV Leadership Team was established to identify and implement strategies to address the outbreaks. As of December 31, 2018, the number of newly diagnosed cases reported had fallen to 30, representing a 49% decrease from the outbreak peak in 2016. As well, the number of cases reporting injection drug use as a risk factor has decreased from 74% of cases in 2016 to 52% of cases in 2018. Currently, there have been 19 cases reported in 2021.

The key initiatives believed to have contributed to this significant reduction in new cases include:

• enhanced collaboration in client support provided by the agencies involved in HIV care;
• implementation of HIV outreach programs, as well as use of assertive engagement models of care;
• establishment of the Temporary Overdose Prevention Site, now a Consumption and Treatment Services;
• increased access to harm reduction supplies, naloxone training and distribution and HIV testing;
• targeted public awareness campaigns promoting safer injection practices and;
• increasing HIV testing in Emergency Departments

The marked reduction in the annual number of new HIV cases over the past 5 years is a very positive trend and has demonstrated the value of collaboration, education, and evidence-based intervention.

7 Perspectives on HIV Care and Support Services for African, Caribbean and Black Women living with HIV in Winnipeg, Manitoba

Chinyere Njeze[1], Andrew Hatala[1]
[1]*University of Manitoba, Winnipeg, Canada*

Despite growing HIV studies, scholarly investigations, and published data on HIV care and support among African, Caribbean, and Black (ACB) women living with HIV in Winnipeg, Manitoba continues to be scant and literally non-existent. HIV care and support remain seemingly important to meet the increasingly complex needs of people living with HIV and ensure they live long healthy, and independent lives.

This qualitative study informed by critical race theory and feminist methodological design —focused on exploring perspectives on HIV-care and support services for HIV-positive ACB women in Winnipeg, through in-depth semi-structured face-to-face, and telephone interviews with 11 HIV-positive ACB women and 12 service providers. Notably, it seeks to uncover knowledge, attitudes, beliefs, and feelings related to HIV-care and support services in Winnipeg as well as use and perceptions of these services.

An analysis of the interviews draws attention to various intersecting structural, systemic, and interpersonal forces implicated in ACB women's access and experiences of HIV care and support. Key themes emerged related to issues of stigma and discrimination within and outside the ACB community, systemic neglect, limited awareness of HIV-program availability, and determination to achieve set personal goals.

The findings showcase unique experiences of ACB women as racial minorities and reveal underlying factors that impact ACB women's use and experiences of HIV services. Issues of stigma and discrimination, including lack of knowledge on HIV services, can account for a significant decrease in uptake of HIV programs. However, conversely, the determination of ACB women to stay healthy, support their families and achieve set goals can impact HIV-care utilization and support women's day-to-day experiences.

To promote access and health of HIV-positive ACB women, it becomes vital to increase HIV-care services information sharing with ACB women, engage with these women communities and organizations to ascertain major targets for social-structural interventions and policy advocacy.

13 'What other choices might I have made?': Sexual Minority Men, the PrEP Cascade and the Shifting Subjective Dimensions of HIV Risk

Mark Gaspar[1], Alex Wells[2], Mark Hull[3], Darrell H.S. Tan[1,4], Nathan Lachowsky[2], Daniel Grace[1]
[1]University Of Toronto, Toronto, Canada, [2]University of Victoria, Victoria, Canada, [3]University of British Columbia, Vancouver, Canada, [4]St Michael's Hospital, Toronto, Canada

Background: The PrEP Cascade is a framework used for evaluating the implementation of HIV pre-exposure prophylaxis (PrEP) programs. The Cascade is a series of steps patients and providers take to get people on PrEP. In Canada, there has been limited qualitative research on gay, bisexual, and queer men's (GBM) PrEP decision-making through the Cascade.

Methods: In 2020, we interviewed 37 PrEP users and 8 non-PrEP users living in Ontario and British Columbia about their decision-making through the Cascade. Participants were HIV-negative cis and trans GBM. The data were analyzed using thematic analysis.

Results: In addition to responding to COVID-19 lockdown measures, participants choose to start, stop, pause, and re-start PrEP due to various barriers and factors related to shifting pragmatic considerations (logistical effort and financial costs), biomedical considerations (efficacy, side effects, and sexually transmitted infections) and subjective considerations (identity, community politics, and changing sexual preferences). Symbolic and generational attachments to established versions of safer sex (condoms and serosorting) made some participants less likely to try PrEP, especially GBM born in the 80s and early 90s. Some GBM expressed increased social expectations to use PrEP and to have condomless sex and serodifferent sex. Some expressed how their concerns with side-effects were deterrents to them trying PrEP. Several discussed a shift from PrEP use being understood as rare and stigmatized, to becoming a normative expectation in GBM culture.

Discussion and Implications: PrEP has altered sexual practices in diverse ways. Healthcare providers must understand these shifts in order to help GBM make informed choices about PrEP, especially in relation to stopping or pausing PrEP. Our findings support offering PrEP at no-cost and providing individualized sexual health counselling to discuss PrEP use and changing sexual practices. More effective education is needed to communicate the manageability of PrEP side-effects.

42 Evaluating HIV in Motion, a Community of Practice on Living with HIV and Physical Exercise

Francisco Ibanez-carrasco[1,2], **George Da Silva[2]**, Glen Bradford[2], Colleen Price[2], Shaz Islam[2], Larry Baxter[2], Joanne Lindsay[2], Brittany Torres[2], Tizneem Jiancaro[2], Kelly O'Brien[2]
[1]University of Toronto, Dalla Lana School of Public Health, Toronto, Canada, [2]University of Toronto, Department of Physical Therapy, Toronto, Canada

GOAL: We evaluated our experience establishing and sustaining HIV in MOTION (HIM), a Community of Practice (http://bit.ly/HIVinMOTIONsite) that applies a methodology of “Participatory and Integrated Knowledge Mobilization” (PiKMb) (Nguyen et al. 2020; Ungar et al. 2015) and embedded within a community based research program focused on HIV, rehabilitation and physical activity (CIHR CBR funded 2020 -2021 study on community-exercise; tele-coaching study funded by the OHTN 2021-2023).

EVALUATION: we used quantitative measures such as the number of synchronous online participants and analytics from links to our digital library/website; qualitative measures include attendees’ reports of “intent to use the material presented” and reflections from debrief sessions. OUTPUTS: From October 2020 to September 2021, PiKMb activities included five (5) 2-hour online CoP webinars (each involving ≥8 hours of production), each crafted by 6 national “Ambassadors” and coordinators. Our online events highlight lived experience, research and practice in the area. To date, digital output includes 6 podcasts/edited videos and 2 digital community friendly eLearning tools (micro-learnings) on physical activity and HIV.

RESULTS: >200 diverse academic, fitness staff, and persons living with HIV from Canada, UK, US and have joined the synchronous online events. Of 44 respondents to all evaluations, 44 (100%) indicated intent to use the material and 33 (75%) indicated they would use the information to connect with each other regarding related matters.

CONCLUSION: Due to a dearth in this literature, we cannot formally compare our evaluation results to similar CoPs results; however, comparing/contrasting our results with existing PiKMb reports in the literature suggest that HIM helps build capacity and collaborations and mobilize knowledge regarding physical activity, HIV and rehabilitation; PiKMb benefits community based research but it is costly and energy-intensive; slow uptake of digital products by HIV educators, academics, leaders and clinicians suggest that PiKMb’ products might still be underrated and underused.

44 No VACCINE for this -The case of Latinx communities and HIV in Ontario during COVID times, societal barriers, disabled factors, and current challenges - a critical perspective -yet.

Gerardo Betancourt[1], Celeste Bilbao-Joseph[2]
[1]Faculty of Social Work, University of Toronto, Toronto, Canada, [2]CSSP, Toronto, Canada

Background: The Ontario HIV Epidemiology and Surveillance Initiative (OHESI) (Dec. 2021) pointed out the diverse barriers, disablers, and obstacles that individuals, and communities; may have experienced about HIV testing and treatment due to COVID effects. This might be particularly true with marginalized communities in Ontario.

Description: According to the OHESI (2019) estimates report, Latin individuals testing HIV+ were showing a steady increase for the past measured (2017-2019) years in the province of Ontario. Marginalized communities have traditionally been left behind when dealing with HIV testing in Canada. Many social determinants of health: e.g., immigration status, language barriers, poverty, lack of access to free/anonymity to/in health services, among other factors, have impacted Spanish-speaking communities' HIV prevention efforts, even before COVID hit. There is a lack of knowledge on how the current epidemic, vaccinations, and variables, would have affected HIV testing, treatment, and access to services at the core of different communities in the province.

Lessons Learned: COVID took by surprise nations around the world, the leadership of Ontario as a province that provides efficient health services has been up to question. Although global responses to COVID have moved faster (when compared to other pandemics, including HIV), it is necessary for an intersectional, multilevel lenses approach, to map out how COVID has added up sexual health challenges amongst Latinx individuals in Canada.

Conclusion/Next Steps: There is paucity in supporting research, mental health services, and community education that is specialized in Spanish-speaking cultures, immigrants, language, and culturally sensitive Latinx minorities in Ontario.

Policies supporting PrEP/U=U/condoms/self-test with access to Spanish-spoken regular care (acknowledging particularities of Latinx in Canada - such as (lack of) immigration status, language barriers, sexual orientation, and/or gender diverse individuals) is a must to effectively curve new HIV infections and meet Canada’s HIV infections present and future goals.

71 Zone by Zone: A New Model for 2SGBTQ+ Guys who Party n' Play

Jordan Bond-Gorr[1]
[1]*GMSH, Toronto, Canada*

Background: Ontario's Gay Men's Sexual Health Alliance (GMSH) is a community-led provincial hub of learning, capacity building, and resource development for 2SGBTQ+ men's sexual health. Its efforts align with the Ministry of Health priorities across the HIV prevention, treatment, and care cascade.

Methods: The evidence-based connection between 2SGBTQ+ men's party n' play (PnP), also known as ChemSex, and the increased risk for HIV/STBBI transmission has resulted in service providers needing to be informed of the context and relationship with PnP. The knowledge is crucial to reducing HIV-related harms and mental and physical health outcomes. GMSH's Party n Play campaign developed a framework to hold the complex needs and outcomes of 2SGBTQ+ men who PnP. The consultant and community members developed a framework model of the context and relationship of PnP. The model would look at the broader systemic intersections of oppressions and cultural factors contributing to PnP's trajectories.

Results: The Zones of PnP Engagement emerged as a new model after an extensive literature review and community consultation. Zones of PnP Engagement is a landscape of four distinct zones that guys navigate into, out of, and within throughout their PnP journey. The Zones do not re-stigmatize guys who PnP by overly emphasizing risk, danger, and problematic outcomes and shifts to a more neutral, sex-positive, and harm reduction focus that allows for self-discovery & exploration of self. The Zones opens new spaces for intervention for service providers to develop programs and services.

Conclusion: The Zones of PnP Engagement aims to develop tailored, non-abstinence-based responses that will "meet people where they are at". The Zones represent a key pivot in HIV sector's response to PnP. It will benefit multiple stakeholders and reduce PnP users' stigma and discrimination, focusing on strength-based client-centered care.

89 Developing a PrEP Research Agenda Related to Indigenous Peoples in Canada: A Research Planning Exercise

Tyler Sayers[1], Randy Jackson[2], Darrell H. S. Tan[3,4,5]
[1]University of Waterloo, Waterloo , Canada, [2]Feast Centre for Indigenous STBBI Research, McMaster University, Hamilton , Canada , [3]Division of Infectious Diseases, St. Michael's Hospital, Toronto , Canada, [4]MAP Centre for Urban Health Solutions, St. Michael's Hospital, Toronto, Canada, [5]Department of Medicine, University of Toronto, Toronto, Canada

Background: Limited data suggest that PrEP use in Indigenous communities is low although HIV incidence is significantly higher than in non-Indigenous peoples. We sought to identify research priorities related to PrEP and Indigenous peoples in Canada from the perspective of key stakeholders.

Methods: We conducted exploratory interviews with First Nation, Inuit and Métis community leaders identified through the FEAST Centre for Indigenous STBBI Research and its network of engaged community-based, clinical, academic, and policy-maker stakeholders. We used a semi-structured interview guide based on a theoretical framework regarding access to healthcare. Our work was intended as a research planning exercise to determine community priorities.

Results: Ten participants (7 male, 3 female) offered unique perspectives on PrEP from their lived experiences as Indigenous health researchers, cultural facilitators and healthcare providers in ON, BC, QC, MB and NS. Fourteen themes emerged from the interviews, in three groups. Seven themes involved areas of research that have previously been explored in other populations but not exclusively in Indigenous populations, including stigma affecting PrEP usage, optimal methods for knowledge translation about PrEP with Indigenous people, community awareness of HIV status/risk, optimal rollout strategies for PrEP, affordability, wariness of PrEP services, and risks to consider when promoting PrEP. Five themes were specifically associated with Indigenous populations, including community knowledge about PrEP/HIV, access to knowledgeable health care professionals in Indigenous communities, the role of Elders in PrEP-related work, Indigenous community champions for PrEP, and the importance of self-efficacy. Two themes related to topics for which relevant biomedical knowledge exists but may not have been adequately disseminated in Indigenous communities, including effectiveness of PrEP among women and people who inject drugs.

Conclusion: Research and knowledge translation on these themes may improve how PrEP usage can be increased in a culturally sensitive way to Indigenous peoples in Canada.

90 Preventive Health Measures, PrEP, and the Right to Health: A Human Rights Case Study on Access to Pre-Exposure Prophylaxis for Female Sex Workers in South Africa

Steven Winkelman[1,2]
[1]Ontario HIV Treatment Network, Toronto, Canada, [2]Dalla Lana School of Public Health, Toronto, Canada

HIV Pre-exposure prophylaxis (PrEP) is an increasingly important biomedical tool in the prevention of HIV for HIV-negative individuals. However, given the recency of the medication, there is a lack of human rights-based research regarding access to PrEP for members of HIV-vulnerable populations.

A significantly vulnerable population which could benefit from access to PrEP is female sex workers (FSW) in HIV-endemic or hyperendemic countries This research sought to examine the extent to which access to HIV preventive medicines such as PrEP are ensured under article 12.1: the right to the enjoyment of the highest attainable standard of physical and metal health, and article 15.1b: the right to enjoy the benefits of scientific progress and its applications, of the International Covenant on Economic, Social and Cultural Rights.

This research utilised a case study approach to critically examine the rollout of PrEP for FSW in South Africa, drawing on the country's Bill of Rights, national healthcare policies, and de facto PrEP implementation. While PrEP implementation for FSW in South Africa was guided by a human rights framework, this research found 1) PrEP rollout was largely physically and economically inaccessible for sex workers outside of select clinics or trial sites in urban centres; 2) dissemination of PrEP information for female sex workers was weak, reducing the medicine's acceptability; 3) concerns about South Africa's overburdened public healthcare system and continued criminalization of sex work contributed to a weak uptake of PrEP among sex workers.

It is recommended that leaders in HIV-endemic countries implement legal instruments to increase free PrEP access for FSW in both urban and rural healthcare centres, expand PrEP training for healthcare providers, disseminate information through sex worker social networks, utilise generic PrEP alternatives to reduce costs, and take steps to address other social determinants of health such as decriminalizing sex work.

97 Experiences of Discrimination Among People Living with HIV in Ontario

Adanna Obioha[1], Wesley Oakes[1], Apondi J. Odhiambo[2], Sean Hillier[3], Kristen O'Brien[1], Tsegaye Bekele[1], Francisco Ibáñez-Carrasco[2], Abigail Kroch[1,2,4]
[1]Ontario HIV Treatment Network, Toronto, , [2]Dalla Lana School of Public Health, University of Toronto, Toronto, , [3]York University, Toronto, , [4]Public Health Ontario, Toronto

Background: Discrimination is a driver of negative health outcomes. Through the lens of intersectionality, we recognize that people living with HIV have many identities that put them at risk for discrimination and HIV stigma. These experiences can drive transmission of HIV as well as negative outcomes for people living with HIV.

Methods: The OCS is a community-governed longitudinal study of people receiving HIV care at 15 clinics in Ontario. The Experiences of Discrimination tool (Williams et al, 2003) was adapted to include HIV status and for a Canadian context was included in the OCS questionnaire in 2020. Participants were asked about experiences of unfairness in work, healthcare, immigration/law enforcement, education, housing, and community settings. They were asked if they attribute those experiences to various aspects of their identity, including race and HIV status, reported here.

Results: 1,811 participants responded to the discrimination tool in the questionnaire. 44% of respondents reported that they had experienced some type of unfairness. 13% reported they were unfairly fired, with 9% attributing it to their race/ethnicity/ancestry and 14% to their HIV status. 14% were told to go back to where they came from, with 77% of attributing it to their race/ethnicity/ancestry. East/SE Asian (26%), South Asian (31%), Latin American (28%) and Black (18%) respondents reported being told to go back to where they came from due to their race/ethnicity/ancestry. 8% were unfairly refused healthcare, with 7% attributing it to their race/ethnicity/ancestry and 63% to their HIV status.

Conclusions: People living with HIV may experience discrimination due to their race/ethnicity, immigration, sexual orientation, and their HIV status. We find that people living with HIV experience discrimination and unfairness including unfair firing and refusal of healthcare. Discrimination in healthcare due to HIV status was particularly evident, as well as community experiences of discrimination due to race/ethnicity/ancestry.

111 Are gender-neutral admissibility questions the way to go? Acceptability of two qualification scenarios for plasma donations intended for fractionation that include gbMSM

Jessica Caruso[1], **Joanne Otis[1]**, Catherine G. Dussault[1], Justine Benoit[1], Marc Germain[2], Geneviève Myhal[2], Ken Monteith[3], Gabriel Daunais-Laurin[4]
[1]Université du Québec à Montréal, Montréal, Canada, [2]Héma-Québec, Montréal, Canada, [3]COCQ-SIDA, Montréal, Canada, [4]RÉZO, Montréal, Canada

Background: The project aims to document the acceptability and feasibility of plasma donations intended for fractionation for gbMSM. The acceptability of implementation contexts was assessed, including A) adding admissibility questions only to gbMSM (having had more than one sexual partner OR a new sexual partner in the last 3 months), and B) using gender-neutral admissibility questions for all donors (based on FAIR model – having had more than one sexual partner OR a new sexual partner, AND anal sex in the last 3 months).

Method: One-on-one virtual interviews were conducted with 28 gbMSM. Participants were assigned to a group, where only one of the two qualification scenarios was presented to them using single blind. A short questionnaire preceded the interviews.

Results: Participants were aged between 21 and 62 (M=33) and 39% reported ever having donated blood. Acceptability of admissibility questions only for gbMSM was moderate (5,46/10). Although they may represent a small step forward allowing some gbMSM to give, they were seen as a source of discrimination, prejudice, and stigma towards gbMSM, since others are not held accountable for these behaviors. Donations felt partially opened to gbMSM, relieving blood donation agencies from external pressure. Acceptability of gender-neutral admissibility questions was slightly higher (6,40/10). They were seen as more inclusive and equitable. The question about anal sex was perceived as an indirect way of targeting gbMSM and a vector of discrimination and stigma. Participants questioned why the use of condoms isn't considered. Both scenarios were considered poorly inclusive of non-traditional relationship configurations and would still result in the exclusion of many gbMSM. Participants felt frustrated and disappointed, as several wouldn't be eligible to donate.

Conclusion: Despite being more acceptable, gender-neutral admissibility questions can be perceived as prejudicial depending on the behaviours evaluated and the efforts deployed in explaining such a change.

112 Understanding the complexity of intersectional issues in the experience of people living with HIV: a latent class analysis

Ken Monteith[1], Sylvain Beaudry[1], Charlotte Guerlotté[1], **Joanne Otis[2]**, Ludivine Veillette-Bourbeau[2], Maria Nengeh Mensah[2], Hugo Bissonnet[3], Mattie Bombardier[4], Chris Lau[5], Maryse Laroche[6], Joseph Jean-Gilles[7], Roland Nadeau[8], Sylvain Laflamme[9], Zack Marshall[10]
[1]COCQ-SIDA, Montréal, Canada, [2]Université du Québec à Montréal, Montréal, Canada, [3]Le dispensaire (CSA), St-Jérôme, Canada, [4]Centre Action Sida Montréal (CASM), Montréal, Canada, [5]Maison Plein Coeur, Montréal, Canada, [6]Bureau de lutte aux ITSS (BLITSS), Victoriaville, Canada, [7]GAP-VIES, Montréal, Canada, [8]MIELS-Québec, Québec, Canada, [9]BRAS Outaouais, Gatineau, Canada, [10]Université McGill, Montréal, Canada

Context: Using an intersectional framework, this exploratory study aims at understanding the combinations of various social categories likely to produce health inequities among people living with HIV (PLHIV).

Methods: In 2019, under the Stigma index of people living with HIV in Quebec project, 281 PLHIV participated in face-to-face interviews conducted by 9 peer research associates in 8 regions of Quebec. A latent class analysis was performed based on several axes of oppression to identify unobserved subgroups of participants who shared similar social categories. These subgroups were then compared with regards to various psychosocial and health characteristics.

Results: Four classes were identified, each of them characterized by particular combinations of oppressed social categories: C1) people who belong to sexual minorities (43%); C2) women who predominantly belong to racialized minorities (30%); C3) poor people aged 50 and under who belong to sexual minorities and who predominantly engage in sex work (16%), and C4) poor people who predominantly belong to racialized minorities and use drugs (11%). Membership to C1 is associated with lower levels of stigma and higher levels of resilience scores, while membership to C3 and C4 is associated with more unfavourable psychological and social health profiles. Membership to C2 is associated with a lower level of disclosure and higher level of anticipated stigma from the family.

Conclusion: A better understanding of intersectional issues is essential for the implementation of interventions and services contributing to the reduction of health inequities for PLHIV. Despite the small sample size, latent class analysis seems to be a promising approach to identify subgroups based on the intersection of various axes of oppression and the health inequities they produce among PLHIV.

115 Financial and health care planning among older adults living with HIV: Results from the Ontario HIV Treatment Network Cohort Study.

Lucia Light[1], Kelly O'Brien[2], Sharon Walmsley[3], Tsegaye Bekele[1], Adrian Betts[4], Francisco Ibáñez-Carrasco[2], Chad Hammond[6], Abigail Kroch[1,2,5]
[1]Ontario HIVTreatment Network, Toronto, Canada, [2]University of Toronto, Toronto, Canada, [3]University Health Network, Toronto, Canada, [4]AIDS Committee of Durham Region, Oshawa, Canada, [5]Public Health Ontario, Toronto, Canada, [6]University of Saskatchewan, Saskatoon, Canada

Background: With treatment, people living with HIV (PLWH) are living longer. PLWH may have additional needs while they age. We assessed how PLWH are planning financially, for health care and support as they age.

Methods: The OHTN Cohort Study (OCS) is a longitudinal cohort study. In 2020, questions were added to assess how participants were planning for old age. Financial, social and health care planning were described among participants 50 years or older and analyzed using multivariable logistic models, adjusting for combined gender/sexual orientation, time since HIV diagnosis, marital status, income, and age (50-64 vs 65+ years).

Results: 1153 participants responded, with mean age (standard deviation) 59.9 (7.1) years; 70.8% white, 13.5% Black; 16.2% heterosexual women, 14.4% heterosexual men, and 63.1% gay men. Of their future care, 14.7% thought about care preferences, 42.0% have planned for it, 37.4% shared their wishes about it with family/care providers, 41.4% have chosen a Power of Attorney; 28.9% will have enough money in older age; 24.4% can rely on support of family/friends, and 43.3% are concerned about discrimination at long-term care because of their HIV status. Multivariable models showed that participants aged 65+ were less likely to report having chosen a Power of Attorney (Odds Ratio (OR)(95% Confidence Interval (CI): 0.5(0.4,0.7)), having enough money (OR(95%CI): 0.3(0.2,0.4), but had greater concern for discrimination in long-term care due to HIV status (OR(95%CI):1.5(1.1,2.0)) compared with participants 50-64 years old. Gay men were less likely to report having enough money (OR(95%CI)=0.6(0.4,0.97) and relying on support of family/friends (OR(95%CI): 0.6(0.4,0.97) than heterosexual men, but they had greater concerns about discrimination in long-term care due to HIV (OR(95%CI):2.3(1.6,3.5) than heterosexual women.

Conclusion: Older adults living with HIV, especially gay men, can use additional supports for old age planning regarding support, finances, and long-term care.

118 Why and How we Need to Focus on Sub-Sahara African Women Living with HIV and Affected by HIV/AIDS? A Community-Based Population-Specific Approach.

Ngozi Joe-Ikechebelu[1,2], Patience Magagula[3], Mandeep Mucina[4], Charlotte Loppie[1], Catherine Worthington[1], Nathan Lachowsky[1]
[1]School of Public Health & Social Policy, University of Victoria, Victoria, Canada, [2]Faculty of Medicine, Dept. of Community Medicine/Primary Health Care, Chukwuemeka Odumegwu Ojukwu, Amaku-Awka, Nigeria, [3]Afro-Canadian Positive Network of BC, Surrey, Canada, [4]School of Youth and Child Care, University of Victoria, Victoria, Canada

Despite sub-Saharan African women and girls accounting for 63% of new HIV infections globally, there is a dearth of research specific to these migrant women living with HIV in Canada. While Black females in British Columbia represent less than 1% of the general population, they represent 13.3% of new HIV diagnoses among females. From 2011 to 2016, the sub-Saharan African region constituted the highest source of Black immigrants to Canada. Yet, sub-Saharan African women are often aggregated with other Caribbean and Black women, which can conceal their contextual particularities and inequalities. For example, in British Columbia, most newly HIV-diagnosed immigrants were from HIV endemic countries. In this paper, we argue for more research involving sub-Saharan Africa women living with and affected by HIV/AIDS and suggest ways to meaningfully engage this community.

Employing a narrative approach, we present an analysis of nine qualitative, quantitative, or mixed methods community-based HIV studies involving African, Caribbean, and Black (ACB) populations in Canada between 2006 and 2019. Buttressing the need to disaggregate ACB data, we found just two studies specifically involving a sub-Saharan migrant population, while another included some East African countries. Our analysis also highlights the need to ensure and support culturally appropriate approaches to HIV research, particularly those intended to be community-led. We also offer insights to addressing challenges and enhancing opportunities in HIV research with sub-Saharan African women.

Meaningfully engaging sub-Saharan African women and their organizations in community-led research represents a critical opportunity to reduce complex health and social inequalities, support social justice and inform HIV policies and programs for this under-served population.

124 Comfort Discussing Sex with Healthcare Providers, Risky Condomless Anal Sex, and HIV Testing Engagement Among Gay, Bisexual, Two-Spirit and Other Men who have Sex with Men (GB2M)

David J. Brennan[1], David Collict[2], Tsegaye Bekele[3]
[1]Factor-Inwentash Faculty of Social Work (FIFSW), University Of Toronto, Toronto, Canada, [2]Ontario Institute for Studies in Education (OISE), University of Toronto, Toronto, Canada, [3]Ontario HIV Treatment Network (OHTN), Toronto, Canada

Background: Increasing access to HIV testing is important for gay, bisexual, Two-Spirit and other men who have sex with men (GB2M). This analysis sought to examine if comfort with discussing same-sex behaviour with healthcare providers (HCPs) was associated with HIV testing uptake among GB2M.

Methods: GB2M (n=910) were recruited through mobile apps to complete a survey about sexual health and activity. A subset of 79 participants completed a semi-structured interview. HIV-negative participants were queried on HIV testing (last three months), risky condomless anal sex (CAS; last three months), and comfort discussing sex with HCPs. Risky CAS was defined as CAS with HIV-negative partner not on PrEP, HIV-positive partner with detectable viral load, or unknown HIV status partners.

For quantitative data, multivariable logistic regression was used to assess the relationship between comfort discussing sex with HCP and HIV testing. For qualitative data, thematic analysis was used to identify themes associated with comfort discussing sex with HCPs.

Results: Of 910 participants, 206 HIV-negative GB2M who reported risky CAS in the past 3 months were included in analyses. Most were 18-29 years old (65.5 %), White (57.8%), gay (61.7%), single (67.0%), lived in urban centres (91.7%), had university education (51.5%), employed (72.8%), Canadian born (71.4%), and had annual incomes <$40,000 (63.7%). Most perceived themselves at high risk for HIV infection (87.9%) and half (50.5%) felt comfortable discussing sex with HCPs.

Regression analyses indicated GB2M who felt comfortable discussing sex with men with HCPs were more likely to be tested for HIV in the past three months (aOR=2.69; 95% CI: 1.06-6.87; p=0.038) than others. Qualitative data substantiated these findings.

Discussion: HIV testing uptake may be influenced by comfort discussing sex with men with HCPs. The importance of queer competency among HCPs, and non-judgemental healthcare environments may increase GB2M comfortability in discussing sex with men.

127 Access to basic needs services provided by AIDS Service organizations during the COVID-19 pandemic among participants of the Ontario HIV Treatment Network Cohort Study (OCS)

Tsegaye Bekele[1], Pake Newell[1], Carlos Joseph[1], Gilles Charette[2], Kyle Vose[3], Abigail E. Kroch[1,4,5]
[1]The Ontario Hiv Treatment Network, Toronto, Canada, [2]HIV AIDS Regional Services - Kingston, Kingston, Canada, [3]Toronto People with AIDS Foundation, Toronto, Canada, [4]Dalla Lana School of Public Health, University of Toronto, Toronto, Canada, [5]Public Health Ontario, Toronto, Canada

Background: AIDS Service Organizations (ASOs) provide essential services to vulnerable people living with HIV. However, the provision of services has been impacted by measures implemented to curb the COVID-19 pandemic. We examined access to basic needs support services (i.e., food bank, meal delivery, nutritional supplements, help with financial assistance, help with housing, and help getting medications) among people living with HIV.

Methods: The OCS is a community-governed longitudinal study of people receiving HIV care in Ontario. Data for the current study come from OCS participants who completed annual questionnaires before (January 2019 – March 2020) and during (March 2020-October 2021) the COVID-19 pandemic.

Results: A total of 3,181 participants provided data. Of these, 22.1% and 16.2% accessed basic needs services before and during the pandemic, respectively. The three most common services accessed (both pre and during the pandemic) were food bank, help with financial support, and nutritional supplements. Of these top three services, a larger drop (from 12% to 6.3%) was observed in accessing financial support services.

Before the pandemic, a higher percent of younger people (<40 years) than older people (≥40 years) (29.3% vs. 18.5%), women than men (35.1% vs. 28.3%), heterosexual than gay/lesbian/bisexual/queer (27.4% vs. 22.5%), and non-White than White (29.0% vs. 17.0%) participants accessed services. This pattern remained consistent during the pandemic with a higher percent of access among young, women, heterosexual, and non-White participants. However, a more prominent drop was observed in access to services among non-White participants than others.

Conclusions: During the pandemic, 90% of people who needed basic support services have accessed them. Food bank, help with financial support, and nutritional supplements were the top three support services accessed. Further, younger, women, and non-White participants accessed basic needs services than others. Efforts can be targeted to enhance access to services to these specific groups.

130 Understanding Resistance to HIV-Related Stigma Through the Power of Photovoice and Digital Storytelling

Gayle Restall[1], Jacqueline Flett[2], Patricia Ukoli[1], Punam Mehta[1], Elizabeth Hydesmith,[1], Mike Payne[3]
[1]University Of Manitoba, Winnipeg, Canada, [2]Sisters of Fire, Winnipeg, Canada, [3]Nine Circles Community Health Centre, Winnipeg, Canada

Background: The structural and social drivers of HIV-related stigma are a significant public health problem in Canada and globally. HIV stigma and discrimination bear heavily on people's health, well-being, access to resources, and opportunities to flourish. The purpose of this project was to amplify the voices of people living with HIV about their experiences of HIV-related stigma and discrimination in Manitoba.

Methods: The project unfolded in two phases. During the first phase, adults living with HIV were recruited to participate in research informed by photovoice methodology. Participants attended an orientation session during which they were given information on the study purpose and processes as well as guidance on picture taking and journaling. Participants were asked to take pictures that represented experiences of stigma. Participants chose pictures as a catalyst for dialogue during follow-up individual interviews. Interview transcripts were analyzed qualitatively. During the second phase of the study, purposefully selected participants were invited to create a three minute digital story about HIV-related stigma.

Results: Eleven people living with HIV (64% women; mean age = 46 years; mean length of time since diagnosis = 14 years) participated in the photovoice phase of the study. Through pictures and dialogue, they expressed the emotional and social impacts of oppressive structural and interpersonal attitudes and behaviours toward people living with HIV compounded by intersections of additional forms of oppression including racism, sexism, and homophobia. They relayed stories of transitions toward confronting and resisting these oppressions through caring for themselves, people, and pets; reconfiguring social networks; and resisting and disrupting stigmas. A video digital story will be presented to illustrate one participant's message to disrupt stigma.

Conclusion: Photovoice and digital storytelling elicited powerful stories of people's experiences of stigma and discrimination and the ways they confronted stigma through caring, social networks, and resistance.

150 The 2020 GMSH PnP Survey – Peers and Possibilities

Jordan Bond-Gorr[1,2], **Dane Griffiths**[1], Dr. David J Brennan[3], Fabliha Nanzia[3]
[1]GMSH, Toronto, Canada, [2]Person With Lived Experience, Toronto, Canada, [3]University of Faculty of Social Work, Toronto, Canada

Background: Ontario's Gay Men's Sexual Health Alliance (GMSH) is a community-led provincial hub of learning, capacity building, and resource development for 2SGBTQ+ men's sexual health. The GMSH efforts align with the Ministry of Health priorities across the HIV prevention, treatment, and care cascade.

Methods: Research has demonstrated a link between 2SGBTQ men's sexualized drug use,.i.e., “party n play” (PnP), and an increased risk for HIV/STBBI transmission. 2SGBTQ+ PnP users have limited engagement with AIDS Service Organizations, and scant research exists about the needs of 2SGBTQ PnP users for accessing both substance use and HIV/STVBBI harm reduction information and supplies. The GMSH launched the Party n Play survey to collect data from 2SGBTQ PnP users on knowledge of harm reduction best practices, using harm reduction equipment, and exploring how these are currently being acquired in the community. The inclusion criteria were being 18+ years or older, an Ontario resident who used PnP within six months. The survey was promoted via PornHub, Grindr, and social media. There was a draw for a five $100 Visa gift cards as a small honorarium.

Results: Among the 417 respondents who completed the survey, 34% reported they accessed harm reduction supplies via their peers. 37.3% went to peers for harm reduction information, followed by 28% who got information from the internet. 81% of the 516 responses to a question about the topics respondents wanted more information on were substance only topics.

Conclusion: 2SGBTQ PnP users receive substantial HR information and supplies from peers, while indicating a need for safer substance use guidance. We conclude the following
1) Engage people with lived experience to create accessible programming and specifically, to improve access to harm reduction supplies for 2SGBTQ+ men who PnP.
2) Prioritize sharing PnP related harm reduction information to empower 2SGBTQ+ men to PnP safely.

151 Building capacity in quantitative research and data storytelling to enhance knowledge translation: a training curriculum for peer researchers

Jason M. Lo Hog Tian[1,2,3], James Watson[1,2], Megan Deyman[1,2], Billy Tran[1,2,3], Paul Kerber[1,2], Michio Magill[1,2], **Deborah Norris**[1,2], Kim Samson[1,2], Lynne Cioppa[1,2], Michael Murphy[1,2], A. Mcgee[1,2], Monisola Ajiboye[1,2], Lori Chambers[4], Catherine Worthington[5], Sean B. Rourke[1,2,6]
[1]MAP Centre for Urban Health Solutions, Unity Health Toronto, Toronto, Canada, [2]REACH Nexus, Toronto, Canada, [3]Institute of Medical Science, University of Toronto, Toronto, Canada, [4]Factor-Inwentash Faculty of Social Work, University of Toronto, Toronto, Canada, [5]School of Public Health and Social Policy, University of Victoria, Victoria, Canada, [6]Department of Psychiatry, University of Toronto, Toronto, Canada

Many community-based HIV research studies incorporate the principles of greater and meaningful engagement of people living with HIV (GIPA/MEPA) by training them 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. To address these gaps, we developed and evaluated an eight-week training course that aimed to build capacity around the understanding and interpretation of quantitative data and incorporating lived experience to increase the impact of the knowledge transfer and exchange phase of a research study.

Peer researchers (n=8) participated online from British Columbia, Alberta, and Ontario. Lessons learned were implemented throughout the dissemination of research findings from the People Living with HIV Stigma Index study. Focus groups were held with course facilitators and peer researchers to discuss their training experiences, and peer researchers answered a quantitative 16-item pre- and post-training self-assessment survey to evaluate the training. This work was created in collaboration with and includes the perspectives of both the peer researchers involved in the training and the course facilitators.

Peer researchers' self-assessed knowledge and understanding of quantitative research and data storytelling significantly improved (Wilcoxon signed-rank tests; $p<0.05$). Through interactive activities and practice, they gained the confidence to deliver a research presentation which improved their understanding of research findings and helped with discussing results with community partners and study participants. The peer researchers also agreed that integrating lived experience with quantitative data has helped them to make research findings more relatable.

Our training curriculum provides a template for research teams to build capacity in research methods where peer researchers and community members are less often engaged. In doing so, we continue to uphold the principles of GIPA/MEPA and enhance the translation of research knowledge in communities most greatly affected.

153 "Activism is the rent I pay for living on this planet": exploring life stories of people living with HIV and their relationship to major strengths

Madeline Gallard[1], Paul Kerber[1], Kajiko Nanami[1], Darren Lauscher[1], Lonnie Brezina[1], Alfiya Battalova[1], Joanna Mendell[1], Jennifer Demchuk[1], Janice Duddy[1], Sophie Bannar-Martin[2], Catherine Worthington[3]
[1]PAN (Pacific AIDS Network), Vancouver, Canada, [2]Island Health, Victoria, Canada, [3]University of Victoria, Victoria, Canada

Background: People With Lived Experiences' Strengths in the Face of Stigma is a qualitative study that explores people living with HIV's personal strengths and resilience in combatting stigma, and learning more about what makes programs and services work well for people living with HIV. While research focused on stigma can be deficits-based, this study took an intentional strengths-based approach.

Methods: Between September 2020 and May 2021, we interviewed 20 people living with HIV across British Columbia. The interview was conducted by phone and asked questions on topics such as personal strengths, experiences of stigma, visions for the future and ideas for stigma reduction programs and services. We used a mixed inductive/deductive analysis approach to explore our core research questions and also capture the 'roots' of what underlay reported strengths and experiences of confronting stigma.

Results: Though we did not ask participants to share a life story directly, many participants responded to questions about their major strengths by framing them within life experiences – for example, strengths borne out of living through the AIDS epidemic and through their community involvement. While participants may have initially struggled to identify their own strengths, further questions that illuminated their history allowed them to identify their strengths readily. Some participants also noted that they appreciated the strengths-based approach and that it enriched their experience of the interview.

Discussion: These findings suggest that rather than viewing life history and strengths as two separate elements in an individual's life, it is crucial to recognize how individuals may see their strengths as part of a greater picture. These findings also suggest that research teams could evaluate qualitative interview guides with an eye to a strengths-based approach as such an approach may enrich an interview experience for both the research team and the participant.

154 Learning Together: Analysis Through Differing Perspectives in the Making it Work Study

Madeline Gallard[1], Alicia Koback[1], Edi Young[1], Darren Lauscher[1], Furqan Waleed[1], Jennifer Hoy[2], Janice Duddy[1], Joanna Mendell[1], Jennifer Demchuk[1], Catherine Worthington[3], Sherri Pooyak[4]
[1]PAN (Pacific AIDS Network), Vancouver, Canada, [2]Central Interior Native Health Society, Prince George, Canada, [3]University of Victoria, Victoria, Canada, [4]AHA Centre at Communities, Alliances and Networks (CAAN), Fort Qu'Appelle, Canada

Background: Making it Work is an Indigenous-focused, community-based research project that utilizes a realist evaluation approach in British Columbia co-led by the AHA Centre at Communities, Alliances and Networks (CAAN) and PAN. With guidance from people with lived and living experience(s) on the research team, this study explores why community services work well for people, with a particular focus on case management and community development programs and services that use Indigenous service delivery models.

Methods: Building on our Realist Evaluation theory of change in October 2021, we held four focus groups by Zoom with 30 participants (service users and service providers) to learn more about how or why does this work, for whom and in what circumstances? We explored topics such as peer engagement and leadership in services, culture as harm reduction, and co-location of services and organizations. Study team members supported a primary mixed inductive-deductive analysis on the transcripts from the focus groups. Team members also held regular discussions regarding themes and areas to explore more deeply.

Results: We will present findings from our analysis of these focus groups linking major themes back to our initial theory of change model. Presenting the analysis through points of tension or disagreement will allow our study team and others to delve more deeply into why services work for different people living in different places across BC.

Discussion: These findings suggest that our focus groups unveiled points of tension and divergence that will help us to gain more depth in understanding the 'full picture' of our theory of change and by extension, our research questions. These findings also suggest that research teams can use an approach of focus groups and collaborative research teamwork to assess these points of divergence and utilize them in further stages of their research.

157 Empowering Sexual Health: Land-and-Art-Based Programming with Indigenous and Northern Young People in the Northwest Territories

Lesley Gittings[1], Kalonde Malama[1], Carmen Logie[1], Candice Lys[1,2], Shira Taylor[2], Kayley Inuksuk Mackay[2], Amanda Kanbari[2], Samantha Parker[1], Clara McNamee[1], Charlotte Loppie
[1]Factor-Inwentash Faculty of Social Work, University of Toronto, Toronto, Canada, [2]Fostering Open eXpression among Youth (FOXY)/Strength, Masculinities, and Sexual Health (SMASH), Yellowknife, Canada

Background: Indigenous peoples in Canada experience higher HIV prevalence due to historic and continuing systemic inequities, and Indigenous adolescents are among those shouldering the impacts of colonialism and racism. Art-and-land-based HIV-prevention programming has demonstrated promise to be empowering and support wellbeing, yet further evidence is needed on the impact and efficacy of such approaches with Indigenous adolescents.

Method: Fostering Open eXpression among Youth (FOXY)/Strength, Masculinities, and Sexual Health (SMASH) conduct Peer Leader Retreats as part of an action research program promoting healthy relationships, sexual and reproductive health (SRH), and HIV prevention among Northern and Indigenous adolescents in the NWT. Peer Leader Retreats, which include Indigenous teachings, arts-based methods (e.g., mask-making, beading), leadership skill development, and nature-based activities were held between 2017-2019.

We enrolled 286 participants (n=196 women [trans-inclusive], n=84 men [trans-inclusive], n=5 non-binary), aged 12-19 (mean 14.4, SD 1.3). The majority (n=235) were Indigenous. Participants completed a survey before and after the retreat. Focus group discussions (n=24) were conducted with 158 participants (n=69 boys, n=122 girls) post-retreat. We applied thematic analysis to explore retreat experiences described in focus groups, and Wilcoxon signed-rank tests to examine pre/post retreat changes in leadership, empowerment, and self-confidence.

Results: Qualitatively, themes included: (1) improved leadership abilities and role-modelling; (2) social connectedness; and (3) increased feelings of empowerment/confidence. Quantitatively, leadership post-retreat scores were 3.5 points higher than pre-retreat ($P<0.001$). Self-confidence scores were 3 points higher post-retreat ($P<0.001$) Empowerment post-retreat scores were 4 points higher compared to pre-retreat scores ($P<0.001$).

Discussion: Land-and-art-based programming supports the empowerment of Northern and Indigenous adolescents, improving confidence, leadership and social connectedness. Results provide insight into possible empowerment-related pathways to improved HIV and SRH outcomes. Integrated HIV prevention and empowerment programming can apply strengths-based, peer-led, gender-transformative approaches that attend to individual, relational and communal wellbeing and are grounded in Indigenous teachings.

159 Crystal Methamphetamine Use Predicts Bacterial Sexually Transmitted Infections Among Gay, Bisexual, and Other Men Who Have Sex with Men (GBM)

Trevor Hart[1,2], Syed Noor[1,3], Graham Berlin[1], Shayna Skakoon-Sparling[1], Farideh Tavangar[1,4], Darrell Tan[4,5], Daniel Grace[2], Nathan Lachowsky[9,10], Jody Jollimore[10], Jordan Sang[11], Gilles Lambert[7,8], Herak Apelian[6], Abbie Parlette[1], David Moore[11], Joseph Cox[6,7]
[1]X University (Ryerson), Toronto, Canada, [2]University of Toronto, Toronto, Canada, [3]Louisiana State University Shreveport, Shreveport, US, [4]Division of Infectious Diseases, St. Michael's Hospital, Toronto, Canada, [5]Centre for Urban Health Solutions, St. Michael's Hospital, Toronto, Canada, [6]McGill University, Montreal, Canada, [7]Direction régionale de santé publique , Montreal, Canada, [8]Institut national de santé publique du Québec, Montreal, Canada, [9]University of Victoria, Victoria, Canada, [10]Community-Based Research Centre for Gay Men's Health, Vancouver, Canada, [11]BC Centre for Excellence in HIV/AIDS, Vancouver, Canada

Objectives: We examined crystal methamphetamine (CM) use and diagnosed bacterial STIs among GBM. We also examined whether this association is mediated by negative attitudes toward condoms, escape motives, and sexual behaviours.

Methods: Sexually-active GBM, aged ≥16, were recruited through respondent-driven sampling from February 2017-August 2019. We fit a structural mediation model on the association between baseline CM use and bacterial STI diagnosis at 1-year study follow-up. We estimated indirect paths from CM use to bacterial STIs via: 1) escape motives, 2) negative attitudes toward condoms at baseline and 3) sexual behaviours at 1-year study follow-up (condomless anal sex [CAS], number of sex partners, and oral sex), adjusting for demographic variables (age, race, and HIV status).

Results: Among 2,449 GBM, analyses revealed a non-significant direct effect from baseline CM use to STIs at 1-year follow-up in the mediated model (β=.06; 95%CI, -0.06, 0.16; p=.35). There was one significant indirect path from CM use to STI: CM use to negative attitudes toward condoms to CAS to STIs (β=.02; 95%CI, .01, .04; p=.01). The model fit the data well (weighted root mean square residual=.032).

Discussion: CM use seems to predict subsequent bacterial STIs via negative attitudes toward condoms, which, in turn, is associated with CAS. Interventions to reduce STIs among CM-using GBM should attend to the association between CM use and negative attitudes toward condoms. There is a need to better integrate substance use services with STI/sexual health clinics for GBM.

Suporting Document

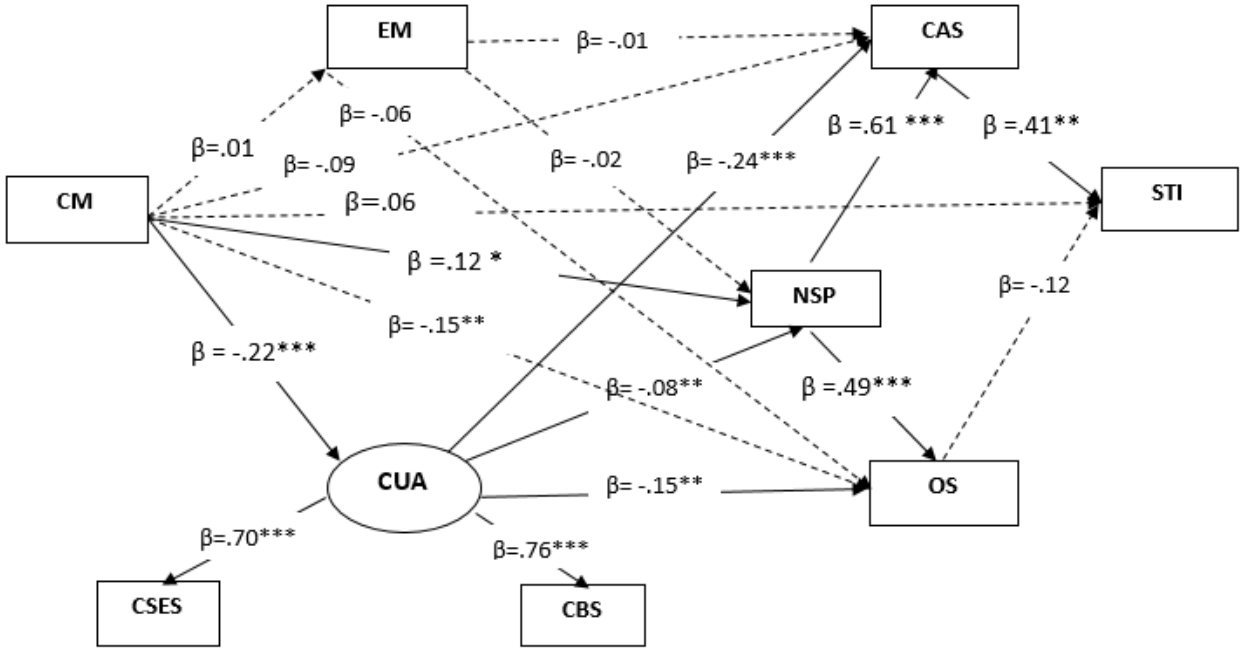

Figure 1. This structural equation model presents associations between crystal methamphetamine (CM) use at baseline and bacterial STIs at 1-year study follow-up, with intermediary associations of condom use attitudes (CUA), escape motive scale (EM) at baseline and condomless anal sex (CAS), number of sex partners (NSP), oral sex (OS) at 1-year study follow-up; Dotted lines represent nonsignificant associations; bold lines represent significant association. β: Standardized coefficient;
*p < 0.05; **p < 0.01; ***p < 0.001.

176 Embedding trans inclusion & integration in the Ontario HIV response: findings from the Trans Interweaving Project

Dane Griffiths[1], Devon MacFarlane[2,3], Joël Xavier[3], Robbie Ahmed[3], Yasmeen Persad[3]
[1]Gay Men's Sexual Health Alliance, Toronto, Canada, [2]Project Lead, Toronto, Canada, [3]Project Team, Toronto, Canada

Background: Ontario's Gay Men's Sexual Health Alliance (GMSH) is a community-led provincial hub of learning, capacity building, and resource development for 2SGBTQ+ men's sexual health. The GMSH's efforts align with Ministry of Health priorities across the HIV prevention, treatment, and care cascade. The Trans Interweaving Project (TIP) is a trans-led priority initiative. The goal of TIP is to examine and explore how the GMSH and Ontario's HIV service organizations could better integrate trans and non-binary people in its programs and services while recognizing the fluidity and diversity of trans experience.

Methods: The TIP team includes a project lead, a three-person project team, and a Community Advisory Committee. Highly collaborative approaches and methodologies were designed and implemented. These included group conversations and sharing circles, informant interviews with cis and trans-HIV sector staff, trans people living with HIV, and a 2-day deliberative dialogue with sector leadership, management, and policymakers.

Results: TIP was a community-based participatory action research project that has produced inclusion indicators for specific segments of the trans community, including Two-Spirit/Indigenous, racialized, Francophone, migrants, and sex workers. Seventy-six individuals participated in groups and interviews, and 47 individuals completed a demographic survey. Participants describe in their own words a vision for participation and engagement in Ontario's HIV sector as service users, staff, volunteers, and community leaders.

Conclusions: Project recommendations have far-reaching implications for the GMSH, community-based organizations in Ontario's HIV sector, and critical stakeholders who serve trans and non-binary people. These include short, medium, and long-term actions to address structural barriers and challenges to participation in the HIV response, implement community mobilization interventions, and the production of HIV and sexual health-related resources, among others.

183 Utilizing a Practical, Culturally Responsive Tool to Support Service Providers to Better Engage Black Gay, Bi, Queer, Same Gender Loving (SGL) Men to Achieve Improved Health Outcomes.

Eric Peters[1], Adam Awad[1], Max Mohenu[1], Phillip Pike[2]
[1]GMSH Gay Men's Sexual Health Alliance, Toronto, Canada, [2] Roaring River Films

Background: While overall HIV seroconversion rates are declining among white gay, bi MSM (gbMSM), rates are increasing among Black gbMSM in Ontario. GMSH, in partnership with Black-CAP and ACCHO, hosted two community dialogues with 40 Black gbMSM from academia, research, arts, culture, and the HIV sector, from which emerged recommendations. One was to develop a storytelling narrative to honor and acknowledge Black gbMSM community wisdom and lived experiences. One to support service providers better understand and respond to Black gbMSM HIV prevention needs in a culturally informed and responsive way.

Method: From the recommendations, GMSH produced Profile and Public Service Announcement (PSA) videos that featured three young Black gbMSM (30 – 37years). Participants were recruited from the community to speak on their shared experiences navigating healthcare systems.

Results: Storytelling is a powerful method to understand Black gbMSM's lived experiences. It creates a medium that amplifies authentic community voices to reach broader audiences. The narratives inform engagement strategies, educate viewers on the intersectionalities of Black gbMSM's identities, race, sexual orientation, and social location for improved service provision.

Conclusions: These PSAs were developed by and for Black gbMSM to bring context to the narrative of their lived experiences in navigating healthcare. The PSAs reveal cultural behaviors and attitudes towards HIV/STBBIs testing, PrEP, sex, sexuality, and navigating assimilation and settlement as a newcomer. Participants' messages provide context and salient factors in Black gbMSM lives, giving background and awareness of how they want to be engaged for inclusive, affirming, and validating health care as Black gbMSM.

198 Understanding COVID-19 vaccine confidence in people living with HIV in Canada: A pan-Canadian survey

Cecilia T. Costiniuk[1], Joel Singer[2,3,4], Yanbo Yang[5], Catharine Chambers[6], Ann Burchell[6,7], Ines Colmegna[8], Sugandhi del Canto[9], Guy-Henri Godin[9], Maluba Habanyama[9], Christian Hui[9,10], Abigail Kroch[11], Enrico Mandarino[9], Shari Margolese[9], Carrie Martin[9], Maureen Oswino[9], Tima Mohammadi[3], Sandra Pelaez[12], Hasina Samji[13], Wei Zhang[3], Curtis Cooper[14], Aslam Anis[2,3,4]
[1]Chronic Viral Illness Service, McGill University Health Centre and Infectious Diseases and Immunity in Global Health Program, Research Institute of the McGill University Health Centre, Montreal, Canada, [2]School of Population and Public Health, University of British Columbia, Vancouver, Canada, [3]Centre for Health Evaluation and Outcome Sciences, St. Paul's Hospital, Vancouver, Canada, [4]Canadian HIV Trials Network, Vancouver, Canada, [5]Faculty of Medicine, McGill University, Montreal, Canada, [6]Dalla Lana School of Public Health, Toronto, Canada, [7]Department of Family and Community Medicine, St Michael's Hospital, Unity Health Toronto, Toronto, Canada, [8]Division of Rheumatology, Department of Medicine, McGill University Health Centre, Montreal, Canada, [9]Community Advisory Committee, Canadian HIV Trials Network, Vancouver, Canada, [10]Yeates School of Graduate Studies, Ryerson University, Toronto, Canada, [11]Ontario HIV Treatment Network, Toronto, Canada, [12]School of Kinesiology and Physical Activity Sciences, Faculty of Medicine, University of Montreal, Montreal, Canada, [13]British Columbia Centre for Disease Control and Faculty of Health Sciences, Simon Fraser University , Burnaby, Canada, [14]The Ottawa Hospital and Ottawa Hospital Research Institute, Ottawa, Canada

Background: While the advent of safe and effective COVID-19 vaccines for the general population has led to mass vaccination roll-outs, certain populations may lack vaccine confidence. Our objective is to determine socio-behavioural, economic, cultural, and clinical correlates of COVID-19 vaccine confidence and uptake in people living with HIV (PLWH) in Canada. A secondary objective is to evaluate the level of COVID-19 and COVID-19 vaccine knowledge in PLWH.

Methods: With community members, we developed a study questionnaire with items from the validated National Advisory Committee on Immunization Acceptability Matrix including: a) perception of vaccine safety and efficacy; b) perception of disease susceptibility and severity; c) access to vaccination; and d) knowledge, attitudes, and trust. PLWH will be recruited via social media and through community-based organizations from January-April 2022 (target recruitment=250). Participants will include vulnerable populations and/or those at higher risk for COVID-19, e.g., men who have sex with men, people who inject drugs, women, persons of African, Caribbean or Black communities, persons from Indigenous communities and persons >65 years old. The primary endpoint will be total scores on the 5-item Likert scale of vaccine confidence. Secondary endpoint will be percentage of correct answers on questions related to COVID-19/COVID-19 vaccine knowledge.

Analysis: Descriptive statistics will be used to summarize results and compare responses between PLWH who have received vs those who have not received COVID-19 vaccine(s). For each participant, scores on the 5-point Likert scale will be added together (reversing for direction, as necessary). Logistic regression models will be used to identify factors associated with COVID-19 vaccine uptake such as age, sex, gender, and responses to the vaccine confidence questions. For knowledge items, score as a percentage of correct responses will be reported. Preliminary results will be presented during the conference.

Conclusions: Findings will guide educational interventions targeted towards specific sub-populations.

200 Usage, Barriers, and Disclosure of Integrative Medicine by People living with HIV on Antiretroviral Therapy

Devan Nambiar[1]
[1]*Gay Men's Sexual Health Alliance, Toronto, Canada*

Background: People living with HIV (PLHIV) have been combining antiretroviral therapy (ARV) with Integrative Medicine (IM) for improving their mental, emotional and physical health and well-being. IM is the coordinated use, intake of a wide range of supplements, herbs, vitamins, and practice of mind-body modalities and exercises with conventional medicine.

Methods: A mixed-method research study describes participants' results (n=19) using IM and ARV. The qualitative questions covered comorbidities, barriers to access, side effects, the recommendation from PLHIV on disclosure and usage of IM.

Results: The finding revealed unique IM usage and practice characteristics amongst PLHIV. 17 PLHIV (89 %) disclosed IM use to physicians, but only 31% (n=6) consulted physicians on the type of IM to use. PLHIV consulted their peers 79% (n=15) on best practices of IM. Over 74% (n=14) took a multivitamin and supplements, 26% (n=5) took supplements only, and 53% (n=10) used herbs. IM practices highly utilized by PLHIV are massage therapy (84%), acupuncture (58%), and yoga (53%). PLHIV consulted staff at AIDS Service Organizations 58% (N=11) along with friends, family, and practitioners of IM. The research demonstrates the validation and impact of peer knowledge sharing among PLHIV (79%) on type of IM for maximum efficacy and managing side effects of ARV. 74% (N=14) strongly agree with the positive effect of IM on their health, quality of life, and having a positive outlook. Participants described IM as effective in decreasing stress and providing a sense of empowerment.

Conclusion: PLHIV utilizes and shares peer-based knowledge on IM with their peers on how to make informed decisions on the efficacy of IM over the long term. Further research is critically required to explore the role of IM in the lives of the PLHIV and the aging PLHIV.

203 Understanding Racism through socio-cultural considerations in health policies: Analysis from Infant feeding guidelines for Black Mothers living with HIV in Two North American Cities

Egbe Etowa[1], J. Craig Phillips[2], Jean Hannan[3], Yvette Ashiri[4], Haoua Inoua[5], Bagnini Kohoun[4], Josephine Etowa[2]
[1]University of Windsor, Ontario, Windsor, Canada, [2]University of Ottawa, Ottawa, Canada, [3]Florida International University, MIAMI, United States, [4]Canadian of African Descent Health Organisation, Ottawa, Canada, [5]AIDS Committee of Ottawa, Ottawa, Canada

Background. Anti-Black racism is recognised as a public health problem in Canada. An understanding of the many pathways through which racism impacts on health and healthcare needs of the Black Canadian population is necessary. This analysis focuses on the association of racism and health policy (i.e infant feeding guidelines) in the context of sociocultural expectations from HIV+ Black mothers.

Methods. This study is based on broader mixed-method community-based participatory research. Ethics approval was obtained from affiliated institutions' REB. Quantitative data included Ottawa (n=89) and Miami-Fl (n= 201). Inclusion criterion was having a baby after being HIV+. By hierarchical binary logistic regression modelling (HBLM), we estimated the relationship between sociocultural factors (aligned to infant feeding guidelines) and racism experiences of the mothers. Effects of socioeconomic variables, HIV related factors, and city of residence were accounted for to reach final model ($X2 = 26.01$, $p < .01$, Accuracy =81.1%).
Results. Sociodemographic include age (Ottawa [M = 36.6 years, SD = 6.4], and Miami-FL [M = 32.4 years, SD = 5.8]; married (Ottawa [33.3%, n=29] and Miami [60.8%, n= 122]); completed university education (Ottawa [58.8%, n=50] and Miami [33.2%, n= 66]); employed (Ottawa [57.3%, n=51] and Miami [32.7%, n=62]); years since being HIV+ (Ottawa [M = 12.7 years, SD = 6.4] and Miami [M = 10.9 years, SD = 7.3]). Odds of racism is reduced when: i) cultural beliefs on infant feeding (OR = .06, p<.01, CI =.01, .38) align with policy, ii) family opinions on infant feeding (OR = .05, p<.01, CI =.01, .4) align with policy. Education, social supports, and vigilance independently reduced the odds of racism.

Discussion and Implication. Congruency of socio-cultural expectations with infant feeding policy reduced the odds of racism among HIV+ Black mothers. Considerations of socio-cultural contexts in health policies are important to address racism and health inequity.

232 GIPA Homefire: IPHA Leadership & Re-Imagining Analysis During COVID-19

Charlene France[1], **Michael Parsons[1]**, Brittany Skov[3], Marni Amirault[1], Doris Peltier[2], Trevor Stratton[1], Tracey Prentice, Renée Masching[1], Randy Jackson[2]
[1]CAAN - Communities, Alliances, & Networks, Fort Qu'Appelle, Canada, [2]McMaster University, Hamilton, Canada, [3]University of Victoria, Victoria, Canada

Background: The GIPA Homefire project brings together Indigenous People Living with HIV/AIDS (IPHAs), community and academic researchers to explore an Indigenous conceptualization of GIPA (Greater Involvement of People living with AIDS). This research team is led by 10 IPHAs and 5 Allies and co-coordinated by an additional IPHA team member and an ally. Our team values IPHA leadership in all aspects of responding to HIV, including when conducting rigorous and meaningful Community-Based Research (CBR). Before COVID-19, we intended to host an in-person, participatory research analysis meeting over several days. Like so many CBR projects, we were forced to change our plans and seek ways to engage virtually.

Methodology: The GIPA Homefire project applies a multi-pronged, mixed-method approach emphasizing Indigenous ways of knowing, decolonizing research methodologies, Two Eyed Seeing, and principles of CBR. Indigenous culture and ceremony play an important role in the success of our project. Finding ways to continue these practices virtually has been arduous, challenging us to find ways to adapt and move forward.

Findings: Many of our IPHA team members became disengaged due to impacts of the pandemic on their daily lives. We have reached out directly to check in with team members and share project updates to support ongoing engagement. To encourage team members to come back to the team as a collective and the important work of research analysis, we held a virtual pipe ceremony. We found that more team members joined online for ceremony and, even in a virtual setting, culture and connection can happen successfully.

Next Steps: Sustaining online engagement in research activities remains challenging. In this presentation, we will share the outcomes of our plans for a more personalized approach to engagement, including lessons learned about how to incorporate ceremony with technologically based approaches to support team contributions.

239 Exploring Arts-based interventions for youth substance use prevention: a scoping review of literature

Jordan Sherstobitoff, Geoffrey Maina, Thea Herzog

Prince Albert has a HIV rate of 56.4 people per 100,000 population this is 8.2x higher than the Canadian average. 67% of newly diagnosed individuals reported injecting drugs. Youth 19 and younger represent 2.7% of newly diagnosed cases in Saskatchewan.

Substance use is a major driver for HIV infections in this region, where the rate of substance use among the youth is 11% higher than the national average for grade 10-12 students. This substance use is reported to start at a very young age which is thought to be due to diverse maladaptive mechanisms to life's stressors, such as poverty or homelessness, ease of availabilty of substances, response to trauma and living in an environement inodiated with substances.

Early substance use prevention for youth in this region can prevent risks for illness such as HIV or delay detrimental effects of substance use on the health. Active youth involvement in substance use prevention is urgently needed to respond to youth alcohol and substance use. Young people must be engaged, empowered in all the phases of the research process including identification of the intervention.

Arts-based interventions are ideal participatory action approaches that can empower young people to be agents in substance use and HIV prevention. Art-based interventions help to promote health, reduce harm, and change behaviors.

This scoping review aims to explore various arts-based substance use prevention interventions for young people. Thematic analysis will be applied to appraise the articles included in the review. The scoping review will provide insight into interventions that can be considered among youth and the community of Prince Albert, Saskatchewan that improve population health and reduce the risk factors of substance use.

The findings will be presented to community stakeholders and will inform the interventions that will be developed to respond to substance use among this population

242 An Environmental Scan of Service Adaptations in Community-Based Harm Reduction Services for Indigenous Peoples in Response to the COVID-19 Pandemic

Savannah Swann[2], **Caterina Kendrick[1]**, Carly Welham[2], Sugandhi del Canto[1], Elaine Hyshka[3], Holly Mathias[3], Valerie Nicholson[4], Emily Carson[5], Dylan Richards[1], Juanita Lawson[6], Jason Mercredi[7], Brian Lester[8], Scott Elliott[2], Margaret Kisikaw Piyesis[1], Patrick McDougall[2], Renée Masching[1]

[1]Communities, Alliances & Networks (CAAN; formerly the Canadian Aboriginal AIDS Network), Fort Qu'Appelle, Canada, [2]Dr. Peter AIDS Foundation, Vancouver, Canada, [3]University of Alberta School of Public Health, Edmonton, Canada, [4]British Columbia Centre for Excellence in HIV/AIDS, Vancouver, Canada, [5]Interagency Coalition on AIDS and Development, Ottawa, Canada, [6]NorWest Community Health Centres, Thunder Bay, Canada, [7]Prairie Harm Reduction, Saskatoon, Canada, [8]Regional HIV/AIDS Connection, London, Canada

BACKGROUND: Indigenous values of relational care and social connections are foundational to harm reduction programming and inform responses to the disproportionate impacts of HIV, the drug poisoning epidemic, and COVID-19 on Indigenous Peoples. Lockdowns, access restrictions and physical distancing requirements to limit the spread of COVID-19 have impeded access to culturally responsive Indigenous harm reduction (IHR) programming. These intersecting pandemics have created an urgent need for frontline organizations to adapt to provide culturally responsive IHR services.

OBJECTIVES: CAAN and the Dr. Peter AIDS Foundation have brought together decades of experience in community-based harm reduction and knowledge translation to identify: 1) how IHR programming for Indigenous Peoples has been impacted by COVID-19, 2) successful adaptations that Indigenous and non-Indigenous frontline organizations have made to provide culturally responsive IHR programming, and 3) resources to address service gaps that impact Indigenous Peoples. The resulting evidence base will support frontline organizations to implement culturally responsive IHR programming.

METHODOLOGY: A rigorous and innovative state-of-the-art literature review, combined with Indigenous Ways of Knowing and Doing, offers a Two-Eyed Seeing (Etuaptmumk) approach to knowledge synthesis. Sharing circles and interviews with key informants (service providers/users of frontline organizations) will further inform a Wise Practices Asset Map of culturally responsive IHR services. This environmental scan is national in scope, informed by sharing circles and interviews in each region (Pacific, Prairies, Central, Atlantic and Northwest Territories).

POTENTIAL IMPLICATIONS: IHR services that support connections to kin, community and culture are vital for meeting the needs of Indigenous people who use harm reduction services, particularly during COVID-19. The results of this 'quick and nimble' environmental scan offer a rapid turnaround of evidence-based wise practices to implement context-specific harm reduction adaptations for Indigenous people during COVID-19. Our project findings will facilitate the data-to-action trajectory of effective community pandemic responses.

264 Living Your Best Life: Understanding What it Means to Live Well with HIV

Puja Ahluwalia[1], Joanne McBane[2], Mina Kazemi[2,3], Kate Murzin[1], **Muluba Habanyama[2,4]**, Tammy C. Yates[1], Jason Brophy[5,6]
[1]Realize, Toronto, Canada, [2]CIHR Canadian HIV Trials Network, Vancouver, Canada, [3]Women's College Research Institute, Toronto, Canada, [4]Canadian Foundation for AIDS Research, Toronto, Canada, [5]CHEO, Ottawa, Canada, [6]University of Ottawa, Ottawa, Canada

Background: Conversation about HIV policy goals beyond viral load suppression is increasing. The need to consider multi-level factors affecting the well-being of structurally marginalized communities, including people living with HIV (PLWHIV), has never been clearer than during the COVID-19 pandemic. This project asked: What does wellness mean to PLWHIV in Canada?

Methods: When COVID-19 hit, Realize and the CAN LhIVE WELL team changed plans for an in-person national dialogue on living well with HIV, entitled Living Your Best Life (LYBL), taking it virtual. Recognizing the need for deliberate action to meaningfully engage PLWHIV virtually, six PLWHIV were hired to facilitate community consultations with specific populations of PLWHIV in advance of the multi-stakeholder dialogue. A semi-structured interview guide was used to explore participants' views on the meaning of living well with HIV.

Notes from the consultations were analyzed thematically and informed the LYBL agenda, with summaries presented during the event. Purposive strategies, including moderated Q&A sessions, facilitated discussions, and synchronous online brainstorming, were also applied to engage LYBL participants on the topic of living well.

Results: COVID-19 was frequently referenced across LYBL, both for its direct impact on the health of PLWHIV and because the pandemic illustrated existing structural inequities that limit wellbeing for PLWHIV. Six themes emerged as central to wellbeing:

1. Culture is a contributor
3. Well-being is unique to everyone
4. Having one's basic needs met is a pre-cursor
4. Conceptualize wellbeing broadly and wholistically
5. Community is an important contributor
6. Multi-level positive healthy actions are needed

Conclusions: COVID-19 has provided policy makers, health practitioners, and researchers with an opportunity to consider wellness more wholistically and engage PLWHIV to formulate responses at the individual, community, and structural levels. Stakeholders should heed the Calls to Action emerging from this successful dialogue, which was re-imagined for COVID-19 times.

267 How's the care out there? A preliminary exploration of the home and community care needs of older adults living with HIV in British Columbia's Fraser Health region

Hesham Ali[1,2], Gary Lising[2], Antonio Marante[3], Claudette Cardinal[3], Patience Magagula[3,4], Sharyle Lyndon[3], Surita Parashar[3,5]
[1]John Ruedy Clinic, St.Paul's Hospital, Vancouver, Canada, [2]Positive Health Services Clinic, Surrey, Canada, [3]BC Centre for Excellence in HIV/AIDS, Vancouver, Canada, [4]Africo-Caribbean Positive Network of BC, Surrey, Canada, [5]Simon Fraser University, Burnaby, Canada

Background: As people living with HIV (PLHIV) grow older, the need for home and community care (HCC) will increase. In British Columbia (BC), publicly-funded HCC includes home support, community nursing, community rehabilitation, assisted living, and long-term care. These services have been designed with consideration of the unique healthcare needs, and support structures of the populations most affected by BC's HIV epidemic, including men who have sex with men; people who use drugs; and Indigenous individuals.

Approach: A team of Peer Research Associates (PRAs – i.e. PLHIV with experience in research and/or Peer Navigation), service providers, and researchers conducted a survey with 8 community-based organizations in Fraser Health Authority (FHA) to identify services accessed by Older Adults Living with HIV (OALHIV – i.e. those age ≥50), and consulted community experts to characterize the issues impacting OALHIV in FHA.

Findings: Transportation support and food support were the services most frequently used by OALHIV. Clients who had immigrated from more traditional cultures appeared to perceive the idea of HCC as alien. HCC promotional materials are mainly in English, and inaccessible to OALHIV whose first language is not English. Interpreter services used to access services often resulted in literal translation, missing cultural nuances. Some clients were hesitant about using interpreters, perhaps due to HIV-related stigma. Peer navigators avoided face-to-face translation services to improve confidentiality and took the extra time and effort to communicate in ways to protect clients' privacy. Finally, many OALHIV live in FHA, yet receive HIV-related and other healthcare services in Vancouver, disrupting care continuity.

Conclusion: FHA encompasses diverse communities that experiences unique challenges and offer distinctive strengths and solutions in terms of accessing or augmenting supports for OALHIV. Through this client-provider-researcher partnership we will strive to translate our findings into changes in policy and programming to better support OALHIV in FHA and beyond.

268 Narratives used in fundraising for harm reduction services at AIDS service, healthcare, and community organizations

Katherine Rudzinski[1], Andre Ceranto[2], Lisa McDonald[2], Alanna Scott[2], Carol Strike[1,3], Dean Valentine[2], Adrian Guta[4], Soo Chan Carusone[2,5]
[1]Dalla Lana School of Public Health, University Of Toronto, Toronto, Canada, [2]Casey House, Toronto, Canada, [3]Li Ka Shing Knowledge Institute, St. Michael's Hospital, Toronto, Canada, [4]School of Social Work, University of Windsor, Windsor, Canada, [5]Department of Health Research Methodology, Evidence, and Impact, McMaster University, Hamilton, Canada

Background: Integrating harm reduction services (HRS) (e.g., supervised consumption services (SCS)) delivery across organizations serving people living with HIV/AIDS and people who use drugs can improve the HIV prevention and treatment cascade. HRS prevent overdose deaths, reduce drug-related harms, facilitate retention in HIV care and increase medication adherence. However, government support of HRS is inconsistent, requiring alternate sources of funding. Literature on fundraising for HIV and HRS is limited. Our study examines narratives used in fundraising for HRS at AIDS service, healthcare, and community organizations across Canada.

Methods: We conducted semi-structured qualitative interviews with fundraisers from organizations that provide SCS or support these services in the community. Interviews focused on the challenges and opportunities of fundraising for programming that addresses a stigmatized and criminalized behavior (drug use), strategies for fundraising, and opportunities for new donors. Data were analysed using thematic analysis.

Results: Participants (N=17) were recruited from Vancouver, Edmonton, Saskatoon, Toronto, Sudbury, and Halifax. When communicating to donors, some fundraisers positioned HRS as a primary client need (overt) whereas others used narratives that blended HRS with other services/client needs (integrated). Narratives varied depending on the size/type/culture of the organization, donor profile, fundraiser autonomy, and political environment. Stigma and criminalization of drug use layered additional challenges onto traditional fundraising issues, but also created new opportunities. Fundraising for a criminalized behaviour required balancing the ethical tensions in sharing client stories and connecting awareness, education, and advocacy with fundraising. Although there were fears of losing donors among a few fundraisers, this was not realized at the organizations that implemented HRS.

Conclusions: Our study demonstrates that although HRS creates some fundraising challenges for AIDS service, healthcare and community organizations, it creates opportunities for engaging new donors. Both integrated and overt fundraising narratives about the need for HRS, can benefit organizations needing supplemental funding.

270 “It’s just all about building relationships”: Care Provider Perspectives on Supporting Care Engagement for People Living with HIV Experiencing HIV Treatment Interruptions

Tatiana Pakhomova[1,2], **Rebeccah Parry[1]**, Tim Wesseling[1], Nicole Dawydiuk[1], Valerie Nicholson[1], Surita Parashar[1,2], David Moore[1,3], Clara Tam[1], Diana Kao[1], Maja Karlsson[4], Deanna Macdonald[4], Robert Hogg[1,2], Rolando Barrios[1,5], Kate Salters[1,2]
[1]BC Centre For Excellence In HIV/AIDS, Vancouver, Canada, [2]Faculty of Health Sciences, Simon Fraser University, Burnaby, Canada, [3]Department of Medicine, Division of Infectious Diseases, University of British Columbia, Vancouver, Canada, [4]Interior Health Authority, Canada, [5]Vancouver Coastal Health, Vancouver, Canada

Background: Advances in HIV care and effective antiretroviral therapy (ART) have led to significant improvements in health and life-expectancy for people living with HIV (PLWH), however, treatment interruptions are common, limiting the full potential of ART. We conducted a strengths-based qualitative study to elucidate the approaches utilized by health care providers (HCP) to overcome barriers to treatment engagement among under-served populations in British Columbia (BC).

Methods: Participants were recruited through regional HIV programs and word of mouth. Purposive sampling ensured inclusion of a wide-range of HIV care providers. An academic and community researcher co-conducted semi-structured telephone interviews with HCPs, exploring approaches used to support PLWH who had experienced treatment disengagement. Participatory analysis and emergent coding, guided by interpretive description, were used to uncover themes.

Results: Across BC’s 5 regional Health Authorities, 19 HCPs were interviewed (November 2020-May 2021), inclusive of 8 public health nurses, 6 social-support staff, 2 peer navigators, and other HCPs working with PLWH. Narratives centered around forming connections and HIV care as a relational practice. Regional resource disparities and the continuation of HIV care as a specialized practice contributed to care fragmentation and increased barriers to services, necessitating ingenuity and creative approaches by HCPs to address care access gaps. Participants underscored the need to foster long-term, trusting relationships with clients, founded on respect, compassion, and non-judgemental approaches. Collaborative relationships with other providers, both formal multidisciplinary team-based care and informal HCP partnerships, emphasized holistic well-being and improved care continuity. Successful engagement approaches supported clients’ overall stability, and were contextually-tailored to address client priorities related to psychosocial and other intersecting health needs.

Conclusion: Preliminary findings identified relationship building, and collaborative care which addresses client priorities, as critical components of successful care engagement. Greater integration of specialized HIV services is needed to strengthen care continuity for PLWH in BC.

274 The Care Collective: Increasing conversations about HIV among African, Caribbean and Black (ACB) women in order to break down HIV stigma and promote routine HIV testing

Wanjiru Munene[1]
[1]*ACCHO, Toronto, Canada*

Background / Objectives: African, Caribbean, and Black (ACB) people make up 4.7% of Ontario's population, yet account for over 25% of first-time HIV diagnoses. Close to 60% of all women newly diagnosed with HIV in Ontario are ACB. Additionally, ACB people are less likely to know their HIV status and to engage in treatment. This overrepresentation of ACB populations, particularly ACB women, highlights gaps in our public health system – gaps underpinned by the Social Determinants of Health, including anti-Black racism and social exclusion.
The Care Collective is a campaign that aims to encourage ACB women to know their HIV status by incorporating regular testing into their self-care practices. Positive Conversations is the latest initiative of The Care Collective, encouraging conversations around HIV to break down stigma – a major driver of HIV infection – and promote HIV testing.

Methods:
- Province-wide online survey for ACB women with about 150 participants.
- Questions focused on HIV awareness, familiarity with HIV, relevance, usage of services and resources.

Key results:
- There is little understanding about the prevalence of HIV among ACB communities, and HIV is not considered to be a top health concern by ACB women.
- HIV carries stigma. Top three words respondents associated with HIV are: disease, death and unprotected sex.
- There is lack of knowledge about living with HIV.
- 75% of respondents are more likely to get tested for HIV if they know someone who has.

Conclusion: Positive Conversations is a ground-breaking initiative that is starting and supporting conversations by and for ACB women. It is building awareness of the rate of HIV among our communities, it encourages HIV testing and it is showing that people living with HIV can and do live long, healthy and beautiful lives – especially if they learn their status early.

276 Culturally Competent Harm Reduction Resources for ACB Populations

Lydia Collins[1]
[1]*ACCHO, Toronto, Canada*

Background / Objectives: It is estimated that 10% of Ontario's population uses substances in harmful ways. Currently, Ontario - like the rest of Canada - is living though an opioid-related crisis, which is compounded by the COVID-19 pandemic. And yet data on substance use among African Caribbean and Black (ACB) communities is limited, leading to few culturally competent services for ACB communities.

The African and Caribbean Council on HIV/AIDS in Ontario's (ACCHO) Harm Reduction Resource for ACB Populations is filling this gap with a substantive resource that ensures harm reduction workers serving ACB communities are well-informed, well-equipped, and empowered to offer the necessary responses.

This resource is grounded in the following:
- ACB communities' harm reduction needs are generally overlooked.
- intersecting aspects of identity (immigrant, LGBTQ+, etc.) impact ACB relationships to substance use in a unique way.
- social determinants of health including race and geographic location have been proven to contribute to ACB interactions with substance use.

Methods:
- Interviews and focus groups with expert harm reduction staff from leading ACB AIDS Service Organization provided:

-background,
-current situation analysis,
-culturally competent and up-to-date information on harm reduction services for ACB communities.

Results:
- Acknowledging racial and cultural biases, stereotypes and attitudes is fundamental in providing quality services.
- Stigma surrounding substance use in ACB communities deters people from seeking harm reduction services.
- ACB trans women, trans men and MSM are often left out of harm reduction responses.
- Digital equity is currently an important consideration, especially for ACB communities and other marginalized populations.

Conclusion: ACCHO's harm reduction resource is an innovative and responsive tool that will ensure that Ontario's ACB populations are not left behind in harm reduction services, particularly at this critical point where harm reduction services are urgently needed to respond to Ontario's overdose crisis.

277 Transcendence from Stigma through Art: Women Living with HIV Show Off

Peggy Frank[1], **Leah Tidey**[1]
[1]*University of Victoria, Victoria, Canada*

Women's stories are important lenses to understanding life with HIV, both in popular culture and academia, but they are often missed or mired in social stigma. In response, a collective of women living with HIV will "Show Off" in an arts-based workshop and public art installation in Victoria, British Columbia, January 2022.

This community-based project adds women's stories of living with HIV to existing and archived data from the "HIV In My Day" project. Co-led by HIV activist/artist, Peggy Frank, and arts-based researcher, Dr. Leah Tidey, participating women explore various art forms as methods of self-expression and knowledge sharing relating to the impact of HIV on their lives.

During the facilitated workshop, approximately eight women will create through movement, painting, sound design, poetry, and/or theatre-based scene creation. Artistic pieces will then be curated into an engaging, interactive art installation open to the public. Both the installation and the workshop build on 21 women's oral histories from the "HIV In My Day" Archive, a collaboration between academic researchers and community partners that has produced a digital archive of 117 oral history interviews conducted in British Columbia with long-term survivors of HIV and their caregivers.

Hearing directly from women living with HIV is the event highlight, whether they share visual art, audio recordings, movement pieces, or a group poem. While our target for the one-day installation is thirty to sixty guests, both the workshop and installation will be video recorded to create an online installation that will be added to the HIV In My Day Archive. We anticipate learning more about strategies to address HIV stigma as well as the strengths and challenges of specific art forms and will create educational tools for women living with HIV that will be shared with stakeholders at conference presentations, online forums, and town hall meetings.

292 A gender-based analysis of the social determinants of HIV knowledge among ACB people in Ontario

Egbe Etowa[1], Wangari Tharao[2], Shamara Baidoobonso[3], Lawrence Mbuagbaw[4], Winston Husbands[9], LaRon Nelson[5], Bagnini Kohoun[6], Sanni Yaya[7], Josephine Etowa[8]
[1]Department of Sociology, Anthropology and Criminology; University of Windsor, Ontario, Windsor, Canada, [2]Women's Health in Women's Hands Community Health Centre, Toronto, Canada, [3]African and Caribbean Council on HIV/AIDS in Ontario, Toronto, Canada, [4]Department of Health Research Methods, Evidence and Impact, McMaster University, Hamilton, Canada, [5]School of Nursing, Yale University, West Haven , USA, [6]Canadians of African Descent Health Organisation, Ottawa, Canada, [7]School of International Development and Global Studies, Faculty of Social Sciences, University of Ottawa, Ottawa, Canada, [8]School of Nursing, Faculty of Health Sciences, University of Ottawa, Ottawa, Canada, [9]Ontario HIV Treatment Network, Toronto, Canada

Background: Gender, race, and class interactions influence health equity and access to health information including HIV knowledge. We explored the effects of the intersection of gender and class (education, employment); gender and other sociodemographic factors (age categories, language groups) on HIV knowledge among the African, Caribbean, and Black (ACB) populations in Ottawa and Toronto. The study will inform gender-specific HIV prevention programming.

Methods: Data were drawn from the 2018-2019 A/C Study survey on HIV transmission and prevention among ACB adults who self-identified as women (n=842) and men (n= 481). We estimated HIV Knowledge using an 18-item HIV Knowledge Questionnaire (scale =18). We used difference-in-difference estimation in hierarchical linear regression modelling to determine interaction effects of gender and class; gender and other sociodemographic factors on HIV Knowledge.

Results: HIV knowledge scores were not statically different (Mean difference = .28, p = .37, 95% CI = -.18, .73) in women and men. However, HIV Knowledge had a positive association with gender when moderated by language (non-English Speaking [β = 2.30, p<.05, 95% CI = .54, 4.05]). City (Toronto [β = 1.23, p<.001, 95% CI = .55, 1.92]), Higher education qualification (β = 1.12, p<.001, 95% CI = .72, 1.52), being employed (β = 0.58, p<.01, 95% CI = .17, .98) and Ever tested for HIV (β = .94, p<.05, 95% CI = .15, 1.73) independently increased HIV Knowledge.

Discussion and Conclusion: HIV prevention programming needs to bridge the knowledge of the non-English speaking populations, and those of ACB men. Tailoring HIV prevention to specific knowledge needs of transnational city residence, persons with lower education, and the unemployed are recommended. HIV testing programs should increase HIV knowledge through concurrent information sessions.

296 How social media can propagate misinformation about COVID-19 and promote stigma, online hate, and trauma: A qualitative analysis of Twitter postings

Joseph Roy Gillis[1], Ashley Lam[1], Ishtiaque Ahmed[1], Maryam Mokhberi[1], Heather Abela[1], Mohamed Al-Refae[1], Zhe Feng[1]
[1]University of Toronto, Toronto, Canada

In addition to the mental and physical health challenges the COVID-19 pandemic has directly introduced, a rise in misinformation related to COVID-19 has emerged, promoting increased expressions of stigma, discrimination, and racism against people of East Asian descent, an understudied group in mental health research.

These negative social media messages have had tangible outcomes for these individuals including an increase in micro-aggressions, threats to safety, and verbal and physical assaults. From a total of over 600 million tweets gathered from Twitter repositories we randomly selected a total of 4,000 tweets using COVID-19 and stigma-related hashtags and systematically analyzed them using thematic coding to identify emergent themes.

Five primary themes that emerged included: (1) blaming and assigning responsibility, (2) reactivated historical stereotypes, (3) criticism of China's oppressive government, (4) political commentaries critical of the Chinese Communist Party, and (5) unspecified direct insults to East Asian community members. Substantial evidence was found for these tweets expressing both group labeling and responsibility: e.g., "Chinese virus" and "bat-eating Chinese".

In addition, we found examples of the communication of peril: "People are dropping like flies in Wuhan". Misinformation towards this virus has the potential to directly interfere with public health policy responses targeted towards the pandemic such as hesitancy towards the vaccines but can also have indirect consequences towards stigmatized and marginalized populations such as individuals of East Asian Descent.

Social media platforms can act as a venue for the widespread dissemination of stigma and stereotypes toward this marginalized group which can promote fear and online hate and intensifies negative stereotypes and discrimination which can translate into violence and hate crimes.

Moreover, increased trauma-related distress and sequelae can emerge following these potentially traumatic events and influence a survivor's sense of self. We discuss some preventative, culturally responsive, and trauma-informed interventions to respond to these outcomes.

298 Building a National Safer Supply Community of Practice

Rebecca Penn[1], Robyn Kalda[2], Alexandra Holtom[3], Fola Ojo[1]
[1]London Intercommunity Health Centre, London, Canada, [2]Alliance for Healthier Communities, Toronto, Canada, [3]Canadian Association of People Who Use Drugs, Dartmouth, Canada

The National Safer Supply Community of Practice (NSS-CoP) is a knowledge exchange initiative tasked with supporting the scale up of medical models of safer supply programs across Canada. These programs provide a model of care for people who use drugs that incorporates harm reduction, primary care, HIV and HCV treatment, and support services that address the social determinants of health.

In this paper, the NSS-CoP team reflects on the processes of building a national interdisciplinary community of practice. We discuss the challenges of bringing together and engaging a diverse group of stakeholders (including pharmacists, clinicians, social care providers, policy makers, researchers, advocates, and people who use drugs) [PWUD]) from different contexts and communities across Canada.

Our members experience different barriers and enablers to providing safer supply. They also have different ideas about how safer supply should be – or could be - implemented. We describe how the NSS-CoP has prioritized creating interdisciplinary spaces to nurture interactions between different kinds of expertise (i.e., clinical, social, lived experience) from different contexts (e.g., urban/rural). As an example, we look at how our informal weekly drop-in meeting has become a vital space for sharing lessons learned, providing different perspectives, offering support, and building relationships between PWUD and clinical and social care providers, and other NSS-CoP members.

We illustrate the ways that in which these interactions are influencing how safer supply is being provided, and what advocacy is undertaken about the future directions of safer supply, e.g., the development of non-medical models, the expansion of pharmaceutical options, and the role of safer supply in transforming relationships between health care providers and PWUD.

299 Safer Supply: Emerging Evidence

Rebecca Penn[1], **Robyn Kalda**
[1]London Intercommunity Health Centre, London, Canada, [2]Alliance for Healthier Communities, Toronto, Canada

Safer supply has gained traction over the course of the past two years as one approach for addressing the drug poisoning crisis. Despite the increase in its uptake as a result of funding for safer supply programs by Health Canada and policy endorsement in BC, there is debate regarding its use, with detractors citing a 'lack of evidence' as their primary reason for their lack of support.

Safer supply involves the prescribing of pharmaceutical grade medications to people who use drugs who are at high risk of overdose. This provides a drug of known quality and potency as an alternative to the illegal drug supply. Safer supply is an innovative approach that is informed by the evidence on heroin-assisted treatment, opioid agonist treatment, and harm reduction. Since funding for programs began in 2020, numerous evaluation studies are underway and preliminary findings are emerging.

This paper presents the emerging evidence about safer supply, including preliminary findings related to health and social outcomes, engagement and retention, and in which direction the evidence is pointing regarding contentious issues such as unsupervised dosing and injection of tablets.

303 Sharing our lessons and knowledge from Weaving our Wisdoms

Jenny Rand[1], Madison Wells[1], Valerie Nicholson[1], Sandy Lambert[1], Knighton Hillstrom[1], Marni Amirault[1], Tracey Prentice[2], Renee Masching[1], Stephanie Nixon[3], **Sherri Pooyak[1]**
[1]CAAN, Dartmouth, Canada, [2]CIHR, Ottawa, Canada, [3]University of Toronto, Toronto, Canada

Background: Weaving our Wisdoms (WoW) is a collaborative initiative that supports Indigenous People living with HIV and AIDS (IPHAs) by fostering connections to land-based teachings delivered by HIV Olders. WoW's HIV Olders are Indigenous People living with HIV or AIDS long term who share their knowledge and wisdom with other IPHAs about living well with HIV. Grounded in an emergent on the land-with the land methodology, WoW focuses on optimizing wellness and "whole"-istic health among IPHAs.

Research Design: Guided by four complimentary approaches to research (community-based research, Indigenous Knowledge, Decolonizing Methods, and Two-Eyed Seeing), WoW employed on the land, with the land methodologies to explore IPHA wellness. Using this approach to explore how IPHAs perceive and understand their health has built the capacity of IPHAs to optimize their own "whole"-istic wellness while reflecting on formal and informal mentorship roles of HIV Olders. This methodology included gathering to spend time together on the land while medicine picking, sharing tipi teachings, hosting sharing circles, engaging in ceremony and feasting. Verbal reflections on these experiences took place at the gathering, and 4-8 weeks after the gathering, where we sought to better understand the impact of on the land, with the land approaches, the role of HIV Olders, the role of peer-to-peer knowledge sharing, and the relevance of sex and gender within on the land, with the land research methodologies. Wisdom catchers took notes during the tipi teachings, sharing circles, and verbal reflections.

Results: Collaborative thematic analysis of the verbal reflections, tipi teachings and sharing circles revealed rich stories surrounding intersections of Indigeneity, Ways of Knowing and Sharing Knowledge, Sex, Sexuality, Gender, and Interconnectedness. WoW also revealed lessons for on the land/with the land approaches, including key considerations for other First Nations, Métis, and Inuit communities.

310 Mâmâwihitowin (Gathering of people): Capacity bridging within HIV research for Indigenous people in Saskatchewan and Manitoba

Dallas Montpetit, **Melissa Morris**, **Waniska Indigenous Centre**, Rebecca Zagozewski, Alexandra King
University of Saskatchewan

Indigenous people and communities in Saskatchewan (SK) and Manitoba (MB) experience marginalization due to ongoing colonization and systemic oppression. This marginalization is seen in health disparities including high rates of HIV, hepatitis C (HCV) and other sexually transmitted and blood-borne infections (STBBI).

Systemic oppression continues to impact Indigenous people's access to healthcare and representation in research. Waniska (a Cree word meaning 'wake up, arise!') is an Indigenous-led and -focused centre for HIV, HCV and STBBI research that reflects the action-oriented nature of Indigenous knowledges.

The goal of waniska is to combat inequities found within HIV/HCV/STBBI research with Indigenous populations in SK and MB. Our work centres Indigenous ways of knowing, meaning-making and doing including etuaptmumk (Two-eyed Seeing) and ethical space through the lenses of trauma-informed and strengths-based approaches towards Indigenous health and wellness. Waniska is innovating research to centre community-based, land- and ceremonial-based approaches that promote wholistic wellness and healing that prioritizes the voices of community, gender diverse people and those with lived experience.

Our research projects are shaped by Community Guiding Circles (CGC) composed of people with lived/living experience, those who are gender diverse, community researchers, Knowledge Holders and Elders.

To support the capacity of CGC members, we are developing mâmâwihitowin, a curriculum of training opportunities around Indigenous research in the areas of HIV, HCV and STBBI. Led by waniska Community Coordinators, mâmâwihitowin will empower community researchers and CGC members to confidently engage in and guide research projects from inception to application.

Through mâmâwihitowin, we aim to ensure that research and programs can access marginalized populations for HIV treatment to ensure equity for those experiencing marginalization in culturally-safe, trauma-informed ways. Mâmâwihitowin and the CGC will ensure that Indigenous communities' priorities for HIV/HCV/STBBI research are actualized in meaningful ways with results that will positively impact their members.

313 Prosecuting HIV-related criminal cases in Canada: A model policy

Richard Elliott[1], **Cecile Kazatchkine[1]**, India Annamanthadoo[1], Sandra Ka Hon Chu
[1]Hiv Legal Network, Toronto, Canada

Background: Canada has been a hotspot of HIV criminalization, primarily via prosecutions for aggravated sexual assault. Prosecutors' and courts' interpretation of the legal requirement to disclose HIV+ status before sex posing a "realistic possibility" of transmission has produced wide application of the law and unjust prosecutions. The "overcriminalization of HIV" has been recognized by civil society, government representatives, international bodies and Parliamentarians.

Activities: Community advocates have campaigned for sound prosecutorial guidelines to limit HIV criminalization, supported by UNAIDS and the Global Commission on HIV and the Law. Canada's substantive criminal law is federal, applicable nation-wide, but the federal prosecution service prosecutes crimes in 3 territories, while provincial Attorneys General and Crown counsel handle prosecutions in 10 provinces. Policy and practice vary significantly across jurisdictions. In 2019, a Parliamentary committee recommended a Canada-wide common prosecutorial directive reflecting important limitations on HIV criminalization urged by civil society and international bodies. In 2021, UNDP published a global Guidance for prosecutors on HIV-related criminal cases. In 2021-22, the HIV Legal Network developed a model policy for prosecutors in the Canadian legal context.

Outcomes: Drawing on the best available science, human rights standards, professional standards for prosecutors, and existing prosecutorial policies or recommendations, the model policy: sets out a general approach to such cases; identifies circumstances in which prosecution is unwarranted, including oral sex and vaginal or anal sex with a condom or when the HIV+ partner has a suppressed or low viral load; considerations regarding the degree of mental culpability that should be required; factors to consider in determining whether a prosecution is in the public interest; and considerations related to pre-trial detention, the conduct of a trial, and sentencing.

Conclusions: The model prosecutorial policy is a resource for further advocacy in the Canadian context to limit unjust prosecutions against people living with HIV.

315 Spiritual Health Care Support

Chantal Mukandoli[1]
[1]*PWA (Toronto People AIDS Foundation), Toronto, Canada*

Background : Spiritual needs are among an individual's essentiel needs in all places and time with physical and spiritual dimensions and mutual affect of these two dimensions , human has spiritual need as well. These needs are an intrinsic need throughout the life, threfore they will remain as a major element of holistic nursing care. One of the greatest challenges for nurses it to satisfy the patient’s spiritual need.

Methods: This is a qualitative study with data were collected 10 women's patients in internal HIV medication and 6 nurses in the perspective wards. Data were generated by open-ended interview and analyzed using rigorousness of findings was confirmed by use of this methode as well as team interpretation, and referring to the text and participants.

Result: Final interpretation of the findings, totaly 6 sub-theme, three themes including formation of mutual relation with patient, encouraging the patient, and providing the neccessary conditions for patients connection with God, and one constitution patern, namerly spiritual need of hospitalized patients.

Conclusion : Spiritual need are those needs whose satisfaction cause the person's spiritual growth and mak the person a social, hopeful individual who always thanks God.. They include the need for communication with other, communication with God and being hopeful. In this study, the three obtained themes are the spiritual needs whose satisfaction is possible in nursing systeme. Considering these spiritual aspect accelentes patients treatment.

Key Words: Spiritual need, communication, patients, phenomenology.

323 We Live and Learn Together: The Social Benefits of an Online Symposium on HIV and Aging Well

Kate Murzin[1], Puja Ahluwalia[1], Mina Kazemi[2,3], Paul Curwin[1,2], Brenda Gagnier[1,2], Jim Kane[1,2], Michael Parsons[1,2,4], Danita Wahpoosewyan[1,2,4,5,6,7], Madeleine Durand[2,8]
[1]Realize, Toronto, Canada, [2]CIHR Canadian HIV Trials Network, Vancouver, Canada, [3]Johns Hopkins School of Nursing, Baltimore, USA, [4]Communities, Alliances & Networks, Fort Qu'Appelle, Canada, [5]Wellness Wheel Medical Outreach Clinic, Regina, Canada, [6]CATIE, Toronto, Canada, [7]AIDS Programs South Saskatchewan, Regina, Canada, [8]Le Centre hospitalier de l'Université de Montréal, Montreal, Canada

Background: Public health responses to COVID-19, though especially important for reducing the risk of serious illness among older adults and those living with comorbidity, including many people living with HIV (PLWHIV), have worsened social isolation for these groups. Previously in-person events and services have been pushed into virtual arenas further exacerbating social isolation and loneliness among aging and older PLWHIV who already experience the same because of stigma, social circles compromised by loss, and financial insecurity.

Method/Process: In October 2021, Realize and the CIHR Canadian HIV Trials Network (CTN) Clinical Care Management Core team co-hosted the 3rd Canadian HIV and Aging symposium. PLWHIV were meaningfully engaged as members of the planning committee and represented more than half of the speaker line-up for the event. An UnConference, hosted in conjunction with the symposium, held space for older PLWHIV to meet and learn from peers through skills-building and self-care workshops. Participant evaluations were collected for both events.

Outcomes: A total of 142 unique participants joined the two events. 84 participant evaluations were completed and the majority of respondents identified as PLWHIV (80%) from Ontario, British Columbia and Alberta. Despite most respondents having living expertise related to HIV, there were modest changes in knowledge (% increase, as measured by a 7-point Likert scale) across the symposium themes: social priorities and service access issues (14%), biomedical and clinical needs (12%), experiences of diverse communities (22%), and the impact of gender (23%). UnConference participants appreciated informal networking activities, and stressed the need for more events that help strengthen community connections.

Conclusions: In the era of COVID, virtual events can still facilitate knowledge exchange, not just dissemination. By centering the lived experiences of PLWHIV, creating opportunities for interaction, and building in informal social activities, a research event increased knowledge and fostered community-building among older