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# Discussing reproductive goals with healthcare providers among women living with HIV in Canada: the role of provider gender and patient comfort

Lashanda Skerritt,<sup>a</sup> Alexandra de Pokomandy,<sup>b</sup> Nadia O'Brien,<sup>c</sup> Nadia Sourial,<sup>d</sup> Ann N Burchell,<sup>e</sup> Gillian Bartlett,<sup>f</sup> Tibor Schuster,<sup>g</sup> Danielle Rouleau,<sup>h</sup> Karène Proulx-Boucher,<sup>i</sup> Neora Pick,<sup>j</sup> Deborah Money,<sup>k</sup> Rebecca Gormley,<sup>l</sup> Allison Carter,<sup>m</sup> Mark H Yudin,<sup>n</sup> Mona Loutfy,<sup>o</sup> Angela Kaida,<sup>p</sup> CHIWOS Research Team\*

a PhD Candidate, Department of Family Medicine, McGill University, Montreal, QC, Canada

b Associate Professor, Department of Family Medicine, McGill University, Montreal QC, Canada; Clinician-Scientist, Chronic Viral Illness Service, McGill University Health Centre, Montreal, QC, Canada

c PhD Candidate, Department of Family Medicine, McGill University, Montreal, QC, Canada; Chronic Viral Illness Service, McGill University Health Centre, Montreal, QC, Canada

d Assistant Research Professor, Department of Family and Emergency Medicine, University of Montreal, Montreal, QC, Canada

e Associate Professor, Department of Family and Community Medicine and Centre for Research on Inner City Health, Li Ka Shing Knowledge Institute, St. Michael's Hospital, Unity Health Toronto, Toronto, ON, Canada; Department of Family and Community Medicine, University of Toronto, Toronto, ON, Canada

f Professor, Department of Family Medicine, McGill University, Montreal, QC, Canada

g Assistant Professor, Department of Family Medicine, McGill University, Montreal, QC, Canada

h Associate Professor, Department of Microbiology, Infection and Immunology, University of Montreal, Montreal, QC, Canada

i Research Coordinator, Chronic Viral Illness Service, McGill University Health Centre, Montreal, QC, Canada

j Medical Director, Oak Tree Clinic, BC Women's Hospital, Vancouver, BC, Canada; Clinical Professor, Division of Infectious Diseases, Department of Medicine, University of British Columbia, Vancouver, BC, Canada

k Professor, Department of Obstetrics and Gynecology, University of British Columbia, Vancouver, BC, Canada; Clinician-Scientist, Women's Health Research Institute, Vancouver, BC, Canada

l Research Coordinator, Faculty of Health Sciences, Simon Fraser University, Burnaby, BC, Canada; British Columbia Centre for Excellence in HIV/AIDS, Vancouver, BC, Canada

m Research Fellow, Faculty of Medicine, Kirby Institute, University of New South Wales, Sydney, NSW, Australia

n Associate Professor, Department of Obstetrics and Gynecology, University of Toronto, Toronto, ON, Canada

o Professor, Faculty of Medicine, University of Toronto, Toronto, Canada; Clinician-Scientist, Women's College Research Institute, Women's College Hospital, Toronto, ON, Canada

p Associate Professor and Canada Research Chair in Global Perspectives in HIV and Sexual and Reproductive Health, Faculty of Health Sciences, Simon Fraser University, Burnaby, BC, Canada. Correspondence: kangela@sfu.ca

**Abstract:** Antiretroviral therapy effectively prevents sexual and vertical transmission of HIV. Yet, some women living with HIV report having unmet needs for reproductive health care. This study measured the prevalence of women discussing reproductive goals with any current healthcare provider and assessed the effect of the current HIV care provider's gender on such discussions and whether comfort was a mediator. We analysed baseline and 18-month survey data from 533 women living with HIV enrolled in the Canadian HIV Women's Sexual and Reproductive Health Cohort Study (CHIWOS) (2013–2017), a community-based

\*The names of additional CHIWOS research team members are listed in Acknowledgements below.

*participatory study, restricting the analysis to participants aged 16–45 years. We used causal mediation analysis to estimate direct and indirect effects of the gender of one's HIV care provider on reproductive discussions, incorporating mediating and interaction effects of women having any provider with whom they felt comfortable discussing reproductive goals. Between the baseline and 18-month follow-up surveys, 34.3% (183/533) of women discussed their reproductive goals with a healthcare provider. Having a woman HIV care provider was associated with a 1.18 excess relative risk (ERR) of discussion (95%CI: 0.15, 2.20). The mediating effect of comfort was primarily explained by the fact that those participants with women providers felt more comfortable discussing their reproductive goals compared to participants with men providers, accounting for 66% (95%CI: 32%, 99%) of the total effect. Findings support that HIV provider gender affects women's comfort and whether they discuss reproductive goals, which must be acknowledged and addressed in care delivery.* DOI: 10.1080/26410397.2021.1932702

**Keywords:** CHIROS, women, HIV, family planning services, pre-conception care, reproductive health, patient comfort

## **Introduction**

Due to advances in HIV treatment and medical care, people are living longer, healthier lives with HIV compared to the early years of the epidemic.<sup>1</sup> Several studies have also established that there is effectively no risk of HIV transmission through sex without a condom when a person living with HIV is on antiretroviral therapy (ART) and has a consistently suppressed viral load.<sup>2–4</sup> Additionally, with appropriate treatment and care, women living with HIV can become pregnant and have children with a very low risk of perinatal HIV transmission (0.4% in Canada).<sup>5–7</sup>

These advances have resulted in changes to the reproductive desires, behaviours, and outcomes of women living with HIV.<sup>8–12</sup> Updates to treatment guidelines, including recommendations for safer conception and contraception, have emerged to support the sexual and reproductive health and rights of people living with or affected by HIV.<sup>13</sup> In one Canadian province (Ontario), an estimated 63% of women of reproductive age living with HIV intended to give birth in the future.<sup>14</sup> These reproductive intentions translate to more pregnancies compared to the earlier years of the HIV epidemic.<sup>10,12</sup>

Despite these trends, women living with HIV report having unmet needs for reproductive health care.<sup>15–17</sup> In a Canadian cohort of women living with HIV, 25% reported becoming pregnant after HIV diagnosis, with 60.8% of these pregnancies being unintended.<sup>18</sup> The World Health Organization (WHO) recommends “dual protection” (long-acting, reversible contraception plus condoms) for women living with HIV to prevent sexual and perinatal transmission of HIV.<sup>19</sup> Less than 20% of

women living with HIV in Canada practise WHO-defined dual protection, and 40% practised an expanded definition of dual protection (long-acting, reversible contraception plus either condoms or a suppressed HIV viral load).<sup>17</sup> The range of contraceptive methods used by women living with HIV is also more limited compared to women in the general Canadian population.<sup>17</sup> Among women living with HIV, studies suggest that awareness about safer conception methods<sup>20,21</sup> and the prevalence of receiving pre-conception counselling are low.<sup>21</sup>

The Canadian HIV Pregnancy Planning Guidelines,<sup>22</sup> the WHO consolidated guideline on sexual and reproductive health and rights of women living with HIV,<sup>23</sup> and community-driven guidelines<sup>24</sup> offer guidance about reproductive counselling and support for women living with HIV. They recommend that healthcare providers initiate discussions about reproductive goals on a regular basis, asking about women's preferred number, spacing, and timing of biological children, or whether women prefer to avoid pregnancy altogether. Nevertheless, existing data suggest that such discussions are not routine; a retrospective study of women of reproductive age living with HIV in Ontario found that 51% reported ever discussing pregnancy planning with a healthcare provider since HIV diagnosis.<sup>21</sup>

A systematic review conducted in 2011 found that the practice of discussing reproductive goals may vary with healthcare provider characteristics such as training, sex, gender, age, and cultural differences affecting provider approaches to sexual health-related discussions with patients.<sup>25</sup> More women HIV care providers in the United States reported assessing the reproductive

intentions of their female patients compared to men HIV care providers (57% [95% CI: 48–65%] vs 40% [95% CI: 31–50%]).<sup>26</sup> As reproductive discussions can be initiated by either the healthcare provider or the patient, we hypothesise that such differences may be explained by gender differences in providers prioritising reproductive counselling, and/or by women living with HIV feeling more comfortable initiating reproductive discussions with women healthcare providers. To inform strategies to support discussions between women living with HIV and their healthcare providers about their reproductive goals, the objectives of this study were to (1) estimate the prevalence of women discussing reproductive goals with any current healthcare provider, (2) assess the effect of their current HIV care provider's gender on discussing reproductive goals, and (3) determine the role of patient comfort as a mediator of the effect of provider gender on reproductive discussions.

## Methods

### Study design

We analysed baseline and 18-month follow-up survey data from The Canadian HIV Women's Sexual and Reproductive Health Cohort Study (CHIWOS), a multi-site longitudinal study following 1422 women living with HIV in three Canadian provinces (British Columbia, Ontario, and Quebec). The methodological approach, described in greater detail elsewhere,<sup>27</sup> followed the tenets of community-based participatory research. The study was approved by the Research Ethics Boards (REBs) at Women's College Hospital (Ontario), Simon Fraser University (BC), University of British Columbia/ Providence Health (BC), McGill University Health Centre (Quebec) and the independent REBs of other study sites. All participants provided written informed consent prior to enrolment.

### Study sample and recruitment

Eligible participants identified as women (cis- and trans-inclusive), were 16 years of age or older, had been diagnosed with HIV, and were living in one of the three study provinces at the time of recruitment. Recruitment occurred between 2013 and 2015 through HIV clinics, AIDS service organisations, online and "word-of-mouth" peer networks.<sup>28</sup> A non-random, purposive sampling approach was used to reflect the geographic distribution of women living with HIV in each study province, and to recruit more trans women and

women less engaged in health care and HIV research. This allowed the analysis of health care access and outcomes for these specific vulnerable populations.

### Inclusion and exclusion criteria

For this analysis, we restricted the sample to cis- and trans-women who completed both the baseline and 18-month follow-up surveys and who were of reproductive age (16–45 years) at baseline. We further excluded women who reported at baseline that they had not accessed HIV medical care in the past year, as they were missing information about the gender of their HIV care provider. We also excluded those who reported at the 18-month visit that discussing reproductive goals was "not applicable" to them because they were unable to conceive and those who preferred not to answer the question ( $n = 3$ ).

### Data collection

Data collection occurred via peer research associate-administered web-based surveys conducted in-person, by phone or by skype.<sup>29</sup> Surveys were administered in English or French using the online software FluidSurveys™. Baseline surveys were administered between 2013 and 2015. The 18-month follow-up survey was completed between 2015 and 2017.

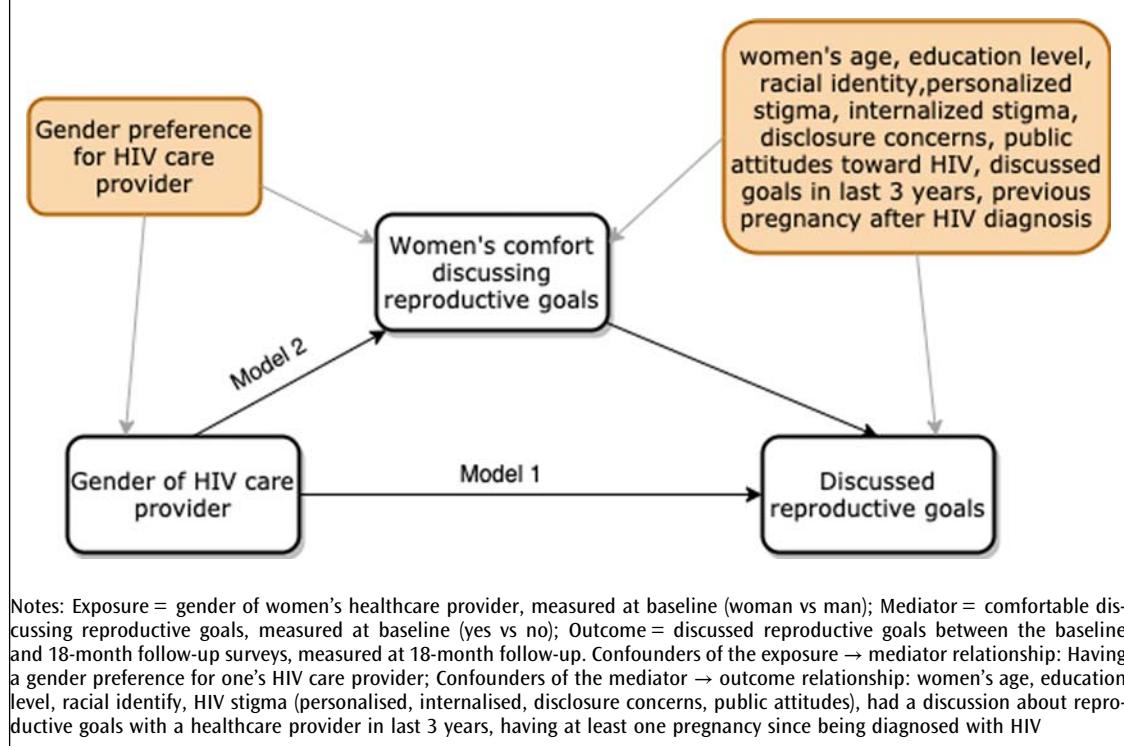
### Measures

A mediation diagram of the relationship between gender of the HIV care provider (exposure) and discussions (outcome) was constructed based on evidence from the literature and input from HIV care providers (Figure 1). The mediator and confounders of the exposure-outcome relationship were identified from the diagram. We hypothesised that women's comfort discussing reproductive goals is a mediator (variable in the causal pathway) between provider gender and discussions.

### *Outcome: discussing reproductive goals*

The outcome was measured at the 18-month study visit, based on participants' responses to the question, "*Since your last CHIWOS interview, have you discussed your reproductive goals with a healthcare provider?*" "Reproductive goals" were defined as women's preferred number, spacing, and timing of biological children or not wanting children. Responses were dichotomised into "yes" and "no". We collapsed the responses "no" and "don't

**Figure 1. Mediation diagram for the hypothesised effect of HIV care provider gender on discussing reproductive goals**



know" ( $n = 1$ ) as not remembering reproductive discussions was considered equivalent to not having the discussion in terms of information retained from the exchange with a healthcare provider.

**Exposure: gender of primary HIV care provider**  
The exposure was the gender of the primary HIV care provider (healthcare provider who primarily prescribes HIV medicines, follows CD4 count, viral load, etc.), which was identified from participants' response to the baseline question "What is the gender of your primary HIV care provider?" Response options were "woman", "man", "trans person", "don't know", and "prefer not to answer".

#### **Mediator: women's comfort discussing reproductive goals**

We considered women's comfort discussing their reproductive goals with a healthcare provider as a mediator (Figure 1) and measured comfort at baseline. Participants were asked, "Do you currently have a healthcare provider with whom you feel

comfortable talking to about your reproductive goals?" Responses were dichotomised into "yes" and "no", combining "no", "don't know" ( $n = 9$ ) and "prefer not to answer" ( $n = 2$ ). We assumed that women preferring not to answer the question about comfort discussing reproductive goals in a peer-administered survey likely indicated a lack of comfort discussing reproductive goals with a healthcare provider.

#### **Confounders**

We measured confounders of the exposure (gender of the HIV care provider)-mediator (women's comfort discussing their reproductive goals with their healthcare provider) relationship. Women indicated their preference for the gender of their HIV care provider: "I prefer my HIV doctor to be a woman", "I prefer my HIV doctor to be a man / no preference or other". As patients in Canada can choose their HIV healthcare provider, this was done to account for women potentially

seeking out women HIV care providers due to gender preference and comfort.

We measured confounders of the mediator (comfort)-outcome (discussions) relationship: women's age (10-year intervals), education level (lower than high school, high school or higher), and race/ethnicity (Indigenous, African/Caribbean/Black, or white), HIV-related stigma, having discussed reproductive goals with a healthcare provider in the three years preceding the baseline survey, and reporting a pregnancy since HIV diagnosis. HIV-related stigma was included in the model to account for its effect on women's comfort in discussing their reproductive goals and its effect on reproductive discussions. We used the validated shortened HIV Stigma Scale (HSS)<sup>30</sup> to measure four HIV-related stigma dimensions: (i) personalised stigma measures experiences of enacted stigma through rejection and isolation; (ii) concerns disclosing HIV status; (iii) negative self-image measures internalised stigma; and (iv) public attitudes measures perceived stigma. HIV-related stigma dimensions were dichotomised to high and low stigma with the sample median as the cut-off. Previous discussions were included in the model to adjust for decreased likelihood of subsequent reproductive discussion if one had occurred recently. All confounders were measured at baseline.

### Statistical analysis

Guided by the mediation diagram (Figure 1), we used two multivariable logistic regression models to estimate odds ratios (and 95% confidence intervals): Model 1, a confounder-adjusted model, was fitted to the data to quantify the association of the exposure (provider gender), mediator (comfort), and their interaction on the outcome (discussions). Including an interaction term allowed us to identify whether strategies to intervene on comfort may have a larger impact on women who receive care from providers of one gender over another. Model 2 is a confounder-adjusted model estimating the association between the exposure and mediator.

To complement the mediation analysis using the logistic regression models, we used the med4-way package<sup>31</sup> in Stata version 15.1 (StataCorp, 2017) to quantify the decomposed effect of HIV care provider gender on reproductive discussions, considering mediation (variable in the pathway between exposure and outcome) and interaction (effect of exposure on outcome varying across

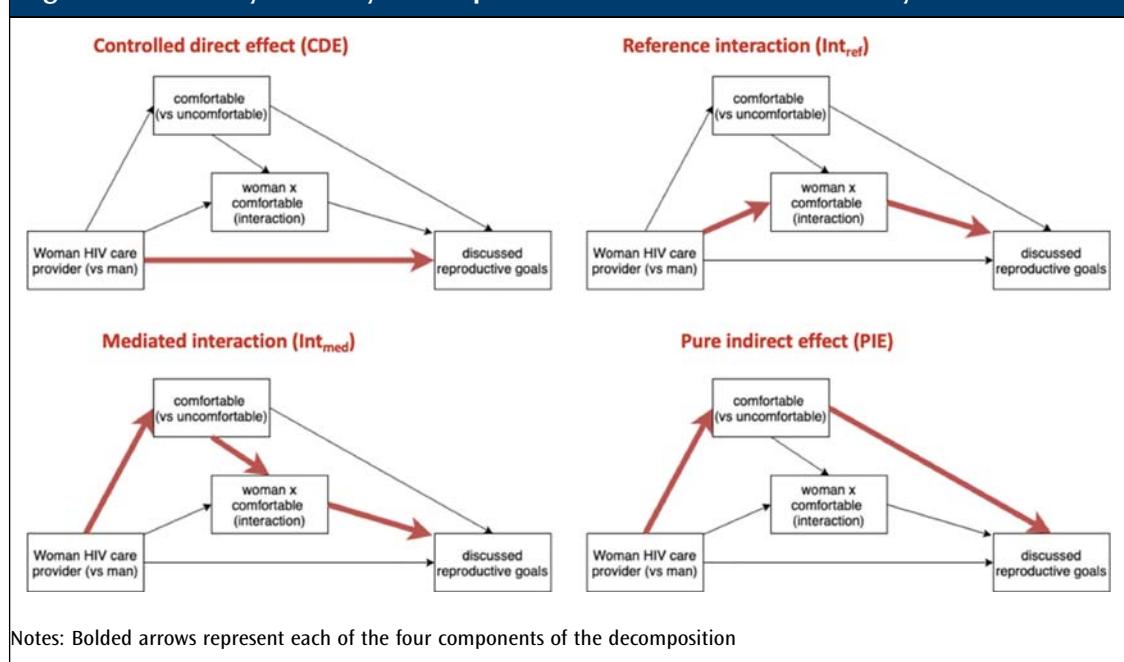
another variable) effects. The med4way package uses parametric regression models to calculate contrasts in decomposed effects.<sup>31</sup> For a binary mediator and outcome, two logistic regression models were fitted: a model for the outcome as a function of the exposure, the mediator, their interaction and confounders and a second model for the mediator as a function of the exposure and confounders. This approach to mediation analysis allowed us to decompose the total effect, while considering interaction effects between the exposure and mediator and nonlinearity in our model. We applied methods described by VanderWeele<sup>32</sup> to decompose the effect into four distinct components: the effect due to mediation only (pure indirect effect), the effect due to interaction only (reference interaction), the effect due to mediation and interaction (mediated interaction), and the effect due to neither mediation nor interaction (controlled direct effect). Our model assumes a counterfactual framework.<sup>32</sup> The four components of the decomposition are illustrated (Figure 2). Estimates are reported as excess relative risk: Excess Relative Risk (ERR) = Risk Ratio (RR) – 1.

## Results

### Sample characteristics

A total of 1422 women living with HIV completed the baseline CHIROS survey and 1252 completed the 18-month follow-up survey for a retention rate of 88%. For the present analysis, we excluded participants over the age of 45 years ( $n = 571$ ), participants who did not access HIV medical care in the previous year ( $n = 59$ ), participants who responded that discussing reproductive goals was not relevant to them as they could not have children ( $n = 154$ ) or who preferred not to answer the question about reproductive discussions ( $n = 3$ ), and participants who were lost to follow-up at the 18-month visit ( $n = 102$ ), yielding a final analytic sample of 533 participants (37.5% of the enrolled cohort).

Table 1 shows the baseline characteristics of the 533 included participants. Women had a median age of 35 [IQR: 31.40] and identified as Indigenous (21.0%), African, Caribbean or Black (36.4%), white (37.3%), and mixed or other race (5.3%). Most participants (85.2%) identified as heterosexual, were taking ART (78.2%), and reported an undetectable HIV viral load (75.2%). Regarding healthcare provider gender, 40.2% received HIV

**Figure 2. Summary of 4-way decomposition in causal mediation analysis**

care from a woman provider and 59.9% from a man. Women's reported reproductive intentions included not intending to become pregnant in the future (41.3%), intending to become pregnant (28.5%), and being unsure (20.6%).

### Reproductive discussions

At baseline, approximately half (46.7%) of women had discussed their reproductive goals with a healthcare provider since being diagnosed with HIV. Subsequently, at the 18-month follow-up survey, 34.3% (183/533) of women reported having discussed their reproductive goals with a healthcare provider since baseline. A quarter of women reported discussing their reproductive goals at both timepoints (136/533), while 21.5% (115/533) reported discussions at baseline only, 7.3% (39/533) at follow-up only, and 37.3% (200/533) at neither baseline nor follow-up. About a quarter (25.9%) of women who had a man as a primary HIV provider discussed their reproductive goals between their baseline and 18-month visits, compared to 46.3% of those who had a woman provider ( $p < 0.001$ ). Among women whose primary HIV provider was a man, 36.4% reported having a healthcare provider with whom they felt comfortable discussing their reproductive

goals, while 70.6% of women with a woman primary HIV provider reported that they had a provider with whom they felt comfortable discussing their reproductive goals ( $p < 0.0001$ ).

**Table 2** presents the confounder-adjusted logistic regression Model 1, with outcome being discussing reproductive goals between the baseline and 18-month follow-up study visits. Having a woman HIV care provider was not associated with discussing reproductive goals when the model was adjusted for comfort and other covariates ( $aOR = 0.72$ ; 95%CI: 0.33, 1.57). Comfort was associated with higher odds of discussing reproductive goals ( $aOR = 2.24$ ; 95%CI: 1.30, 3.87). Among women who reported feeling comfortable, having a woman provider was not associated with reproductive discussions ( $aOR = 0.92$ ; 95%CI: 0.37, 2.29). Among women who reported not feeling comfortable discussing their reproductive goals with a current provider, having a woman provider was associated with lower odds of such discussions ( $aOR = 0.16$ ; 95%CI: 0.05, 0.47). In Model 2, we analysed factors associated with our hypothesised mediator comfort discussing reproductive goals (**Table 3**). We observed that women whose primary HIV care provider was a woman had 4.18 times higher odds (95%CI: 2.70, 6.49) of reporting feeling

**Table 1. Baseline characteristics of participants in the analytical sample (n=533)**

Characteristic		Median [IQR] or n (%)
Province of residence	British Columbia Ontario Quebec	114 (21.39) 307 (57.60) 112 (21.01)
Age at baseline (years)		35 [31, 40]
Racial and/or ethnic background	Indigenous African, Caribbean, Black White Mixed / Other	112 (21.01) 194 (36.40) 199 (37.34) 28 (5.25)
Sex assigned at birth	Male/ Other Female	5 (0.94) 531 (99.06)
Gender identity	Woman Transwoman Other	525 (98.50) 4 (0.75) 4 (0.75)
Sexual orientation	Heterosexual/ Straight LGBTQ/DK/PNTA	454 (85.18) 79 (14.82)
Highest level of formal education	Lower than high school/DK/PNTA High school or higher	69 (12.95) 464 (87.05)
Household annual income (CAD)	<\$20,000 \$20,000-\$40,000 >40,000 DK/PNTA	302 (56.66) 112 (21.01) 100 (18.76) 19 (3.56)
Incarceration history	Never Ever/ DK/PNTA	385 (72.23) 148 (27.77)
What is your current legal status in Canada	Canadian Citizen Landed Immigrant/Permanent Resident Refugee Other/DK/PNTA	397 (74.48) 80 (15.01) 39 (7.32) 17 (3.19)
Relationship status	Married/Relationship/Common-law Single Separated/Divorced/Widowed	198 (37.15) 280 (52.53) 55 (10.32)
Gender of current HIV provider	Woman Man	214 (40.15) 319 (59.85)
Ever discussed reproductive goals with a healthcare provider since HIV diagnosis	No/DK Yes Unable/don't want children PNTA	235 (44.09) 249 (46.72) 46 (8.63) 2 (0.38)
Intention to become pregnant in future	No Yes DK PNTA/Missing	220 (41.28) 152 (28.52) 110 (20.64) 51 (9.57)

(Continued)

**Table 1. Continued**

Characteristic		Median [IQR] or n (%)
Number of children	0 1 to 2 3 to 4 5 or more	233 (43.71) 199 (37.34) 80 (15.01) 21 (3.94)
Pregnancy after HIV diagnosis	Yes No	69 (12.95) 464 (87.05)
Country of birth	Canadian born Foreign born/ DK/PNTA	315 (59.10) 218 (40.90)
Current ART use	Currently on ART Not currently/ DK/ PNTA	417 (78.24) 116 (21.77)
Most recent viral load results	Undetectable (below 50 copies/mL) Detectable (over 50 copies/mL) DK/PNTA	401 (75.23) 95 (17.82) 37 (6.94)
Most recent CD4 count	<200 cells/mm <sup>3</sup> 200-500 cells/mm <sup>3</sup> >500 cells/mm <sup>3</sup> DK/PNTA	22 (4.13) 132 (24.77) 288 (54.03) 91 (17.07)
LGBTQ, Lesbian, Gay, Bisexual Transgender, Two-Spirit, Queer; DK/PNTA, don't know, prefer not to answer; ART, antiretroviral therapy		

comfortable discussing their reproductive goals with a current care provider after adjusting for covariates.

Table 4 presents the total effect of primary HIV care provider gender on discussions decomposed into a controlled direct effect (if everyone was uncomfortable, how much would gender of HIV care provider affect discussions), reference interaction effect (effect of having a woman provider modified by comfort and in the absence of mediation), the mediated interaction (effect of comfort on discussions, where the effect of comfort varies when the provider is woman vs man), and the pure mediated effect (effect of woman provider on discussions due to mediation through comfort only). The total effect of having a woman primary HIV care provider, when the mediator is set to its natural value, corresponded to a 1.18 (95%CI: 0.15, 2.20) excess relative risk (ERR) of reproductive discussion. When fixing the mediator, the controlled direct effect of provider gender is attenuated to -0.18 ERR (95%CI: -0.58, 0.22). The reference interaction between the effects of having a woman provider and

comfort was associated with a 0.59 ERR (95%CI: -0.02, 1.19) of reproductive discussion. The mediated interaction was associated with a 0.49 ERR (95%CI: -0.03, 1.02) of reproductive discussion. The pure indirect effect of provider gender through comfort was associated with a 0.28 ERR (95%CI: 0.06, 0.50) of reproductive discussion. Mediation accounted for 66% (95%CI: 32%, 99%) of the total effect of healthcare provider gender on reproductive discussions.

## Discussion

Among women of reproductive age living with HIV in the cohort, at baseline, 46.7% had discussed their reproductive goals with a healthcare provider since being diagnosed with HIV. Subsequently, 34.3% discussed their reproductive goals over the 18-month observation period. This finding supports previous studies reporting that women living with HIV experience gaps in reproductive health care.<sup>15,16,21,26,33,34</sup> Also consistent with previously published research,<sup>15,26</sup> women who received HIV care from a woman HIV provider were more

**Table 2. Multivariate logistic regression results for Model 1 (outcome: discussed reproductive goals with a healthcare provider between baseline and 18-month follow-up)**

Variable	aOR (95%CI)	p-value
Woman HIV care provider (ref. man)	0.72 (0.33, 1.57)	0.415
Comfortable*	0.92 (0.37, 2.29)	.859
Not comfortable*	0.16 (0.05, 0.47)	0.001
Comfortable (ref. not comfortable)	2.24 (1.30, 3.87)	0.004
Education (ref. lower than HS)	1.35 (0.73, 2.50)	0.339
Personalised stigma (ref. low)	0.62 (0.39, 0.98)	0.043
Negative self-image (ref. low)	0.87 (0.55, 1.38)	0.547
Disclosure concerns (ref. low)	1.04 (0.63, 1.75)	0.861
Public attitudes (ref. low)	1.30 (0.83, 2.03)	0.252
Prefer woman provider (ref. man/ no preference)	1.38 (0.81, 2.35)	0.231
Age <sup>a</sup>	0.76 (0.56, 1.02)	0.071
Indigenous (ref. white/ACB)	0.72 (0.40, 1.29)	0.262
ACB (ref. white/Indigenous)	0.98 (0.61, 1.57)	0.923
Previous discussion within last 3 years (ref. no)	2.13 (1.56, 2.92)	<0.001
Pregnancy after HIV diagnosis (ref. no)	1.47 (0.84, 2.60)	0.180

\*measure of interaction between HIV care provider gender and comfort discussing reproductive goals.

<sup>a</sup>coded at intervals of 10 years.

Note: ACB, African, Caribbean, and/or Black.

likely to have discussed their reproductive goals with a healthcare provider. In our analyses, this included discussions with the primary HIV care provider or any other healthcare provider through referral or other means. We were able to deconstruct the effect of HIV care provider gender, revealing that the effect of HIV care provider gender on reproductive discussions operates principally through an indirect pathway mediated by women's comfort discussing their reproductive goals.

The estimated controlled direct effect was not significant, implying that, hypothetically, if all women had equal comfort discussing their reproductive goals, there would be no association between the gender of women's providers and

whether or not reproductive discussions occurred. That more discussions were reported by women whose provider was also a woman can be primarily explained by differences in women's comfort. Given the intersecting challenges associated with sexuality, reproduction, motherhood, trauma, HIV-related stigma,<sup>35</sup> as well as racism and other forms of oppression that many women living with HIV face, women may feel more comfortable discussing these topics with an HIV care provider who is a woman<sup>36</sup> or asking that provider for a referral to another provider with whom they are more comfortable.

The substantive pathway through women's comfort highlights a point of interest for future interventions aimed at increasing reproductive

**Table 3. Multivariate logistic regression results for Model 2 (mediator modelled as the outcome: comfort discussing reproductive goals with current healthcare provider)**

Variable	aOR (95%CI)	p-value
Woman HIV care provider (ref. man)	4.18 (2.70, 6.49)	<0.001
Education (ref. lower than HS)	1.17 (0.67, 2.06)	0.579
Personalised stigma (ref. low)	1.15 (0.74, 1.80)	0.535
Negative self-image (ref. low)	0.68 (0.43, 1.07)	0.093
Disclosure concerns (ref. low)	0.63 (0.38, 1.04)	0.069
Public attitudes (ref. low)	1.17 (0.77, 1.78)	0.470
Prefer woman provider (ref. man/ no preference)	0.74 (0.44, 1.24)	0.249
Age <sup>a</sup>	0.91 (0.69, 1.21)	0.532
Indigenous (ref. white/ ACB)	0.79 (0.47, 1.31)	0.359
ACB (ref. white/Indigenous)	2.20 (1.40, 3.47)	<0.001
Previous discussion within last 3 years (ref. no)	1.34 (1.00, 1.80)	0.048
Pregnancy after HIV diagnosis (ref. no)	1.59 (0.89, 2.85)	0.116

<sup>a</sup>coded at intervals of 10 years.  
Notes: ACB, African, Caribbean, and/or Black.

**Table 4. Mediation and interaction of comfort and effect of gender of healthcare provider on reproductive discussions (4-way decomposition)**

Component	Interpretation	Excess relative risk <sup>a</sup> (95%CI)	p-value	Proportion attributable (95%CI)
Total effect	Effect of provider gender on discussions	1.18 (0.15, 2.20)	0.024	100%
Controlled direct effect	Effect of provider gender due to neither mediation nor interaction	-0.18 (-0.58, 0.22)	0.367	-15% (-55%, 24%)
Reference interaction	Effect of provider gender due to interaction only	0.59 (-0.02, 1.19)	0.058	50% (19%, 81%)
Mediated interaction	Effect of provider gender due to mediation and interaction	0.49 (-0.03, 1.02)	0.065	42% (18%, 66%)
Pure indirect effect	Effect of provider gender due to mediation only	0.28 (0.06, 0.50)	0.012	24% (-5%, 52%)
Total % mediated		-	-	66% (32%, 99%)

<sup>a</sup>adjusted for education, personalised HIV-related stigma, negative self-image related to HIV stigma, disclosure concerns, public attitudes towards HIV, preferring a woman HIV care provider, age, race/ethnicity, specialty of HIV care provider, previous discussions, previous pregnancy since HIV diagnosis.

discussions between women and their healthcare providers. Promising strategies include integrating women's reproductive health care in the delivery of HIV care<sup>16,37,38</sup> and increasing women's comfort discussing their reproductive goals. An integrated model of HIV care where allied healthcare providers are easily accessible<sup>37</sup> would facilitate reproductive discussions. A pre-post retrospective comparison of attendance at family planning clinics in Nigeria found that attendance at these clinics increased after the implementation of training for providers and formalised referrals between family planning and HIV clinics.<sup>39</sup> In general, HIV care providers of all genders should be capable of providing reproductive health care and counselling to women living with HIV. However, women's comfort discussing their reproductive goals may vary with the gender of their provider and social and cultural experiences.<sup>40,41</sup> Targeted training for care providers who identify as men may also help to educate them about initiating these discussions while addressing the comfort needs of women living with HIV.

Strategies to support women's comfort may include promoting self-efficacy,<sup>42</sup> creating a safe and supportive clinic environment, and signalling that reproductive discussions are welcome. Providers should also be aware of provider-patient and gendered power relations that exist in clinical encounters and approach these discussions accordingly.<sup>43</sup> The introduction of signs in clinic offices, waiting rooms or online<sup>44</sup> with information about pregnancy planning and contraceptives can help to signal that care providers at the clinic support the sexual and reproductive health and rights of women living with HIV. Annual reproductive discussions should also be part of routine HIV care to help normalise these discussions, potentially increasing comfort for both patients and providers.<sup>25</sup>

This study is not without limitations. First, recall bias and social desirability bias may have led to misreporting of reproductive discussions in the past three years, gender preference for HIV care provider, and comfort discussing reproductive goals. Second, women who reported that they were unable to have children were excluded from the analysis, and information on why they were unable to have children is unknown. Hence, reproductive health counselling may still be relevant. Third, participants lost to follow-up, who represent a more marginalised population, were excluded from our analysis which may

have led to an overestimation of the proportion who discussed their reproductive goals between baseline and follow-up. This also limits the generalisability of our findings. Fourth, we did not account for changes in healthcare provider over the study period. Our analysis measured reproductive discussions with any healthcare provider as opposed to with the primary HIV care provider; hence, we cannot conclude whether the effect of having a woman HIV care provider contributes to discussions with that provider or facilitating discussions with other healthcare providers involved in women's health care. We were, however, able to account for women living with HIV accessing health care in various settings by measuring reproductive discussions that occurred with any healthcare provider. Additionally, we did not measure participant and healthcare provider knowledge about reproductive health care for women living with HIV and safer conception strategies. Healthcare provider specialty or training may have influenced the initiation of reproductive discussions, however, reliable data on provider specialty was not available for inclusion in our model.<sup>45</sup> We measured healthcare provider gender and women's comfort discussing reproductive goals at the same time point; consequently, the direction of association cannot be inferred. Reproductive discussions may still be relevant for women who reported being unable to conceive, leading to an overestimation of the proportion of women living with HIV who discussed their reproductive goals with a healthcare provider. Estimations of excess relative risk may be biased by the rare outcome assumption leading to an underestimation of the indirect effect.<sup>46</sup> Finally, there may be unmeasured confounders that were not considered in our model, including post-exposure confounders of the mediator-outcome relationship. We included previous reproductive discussions as a confounder in our model; however, previous discussions may be a post-exposure confounder of the mediator-outcome relationship, which may have led to model bias.

Previous studies have described gaps in the delivery of reproductive health care for women living with HIV. In this study, we empirically assessed the relationships between healthcare provider gender, patient comfort, and discussing reproductive goals. Through the application of components of the causal framework, the longitudinal design of our study, and measured

confounders, we are able to estimate the causal mechanism between healthcare provider gender and reproductive discussions. We highlight a potential avenue for interventions aimed at the delivery of reproductive health care. Further research is needed to better understand the concept of comfort and strategies that promote comfort discussing reproductive goals among women living with HIV. These strategies are needed to support the family planning, preconception, contraceptive, abortion, and sexual health needs of this population.

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*YCHIROS Research Team: Rahma Abdul-Noor (Women's College Research Institute), Aranka Anema (Harvard Medical School), Jonathan Angel (Ottawa Hospital Research Institute), Dada Mamvula Bakombo (McGill University Health Centre), Fatimatou Barry (Women's College Research Institute), Greta Bauer (University of Western Ontario), Kerrigan Beaver (Women's College Research Institute), Marc Boucher (CHU Ste-Justine), Isabelle Boucoiran (CHU Ste-Justine), Jason Brophy (Children's Hospital of Eastern Ontario), Lori Brotto (University of British Columbia), Ann N. Burchell (St. Michael's Hospital), Claudette Cardinal (Simon Fraser University), Allison Carter (Kirby Institute), Lynne Cioppa (Women's College Research Institute), Tracey Conway (Women's College Research Institute), José Côté (Centre Hospitalier de l'Université de Montréal), Jasmine Cotnam (Canadian Aboriginal AIDS Network), Cori d'Ambrumenil (AIDS Vancouver Island), Janice Dayle, (McGill University Health Centre), Erin Ding (British Columbia Centre for Excellence in HIV/AIDS), Danièle Dubuc, (McGill University Health Centre), Janice Duddy (Pacific AIDS Network), Mylène Fernet (Université du Québec à Montréal), Annette Fraleigh (Women's College Research Institute), Peggy Frank (Simon Fraser University), Brenda Gagnier (Women's College Research Institute),*

*Marilou Gagnon (University of Victoria), Jacqueline Gahagan (Dalhousie University), Claudine Gasin-girwa (Women's College Research Institute), Nada Gataric (British Columbia Centre for Excellence in HIV/AIDS), Rebecca Gormley (British Columbia Centre for Excellence in HIV/AIDS), Saara Greene (McMaster University), Danielle Groleau (McGill University), Charlotte Guerlotte (COCQ-SIDA), Trevor Hart (Ryerson University), Catherine Hankins (McGill University), Emily Heer (Alberta Health Services), Robert S. Hogg (Simon Fraser University), Terry Howard (Glasshouse Consultants), Shazia Islam (Women's College Research Institute), Joseph Jean-Gilles (GAP-VIES), Hermione Jefferis (AIDS Vancouver Island), Evin Jones (Pacific AIDS Network), Charu Kaushic (McMaster University), Mina Kazemi (Women's College Research Institute), Mary Kestler (Oak Tree Clinic BCWH) Maxime Kiboyogo (McGill University Health Centre), Marina Klein (McGill University Health Centre), Nadine Kronfli (McGill University Health Center), Gladys Kwaramba (Women's College Research Institute), Gary Lacasse (Canadian AIDS Society), Ashley Lacombe-Duncan (University of Michigan), Melanie Lee (Simon Fraser University), Rebecca Lee (CIHR Canadian HIV Trials Network), Jenny Li (British Columbia Centre for Excellence in HIV/AIDS), Viviane Lima (British Columbia Centre for Excellence in HIV/AIDS), Elisa Lloyd-Smith (Vancouver General Hospital), Carmen Logie (University of Toronto), Evelyn Maan (Oak Tree Clinic), Valérie Martel-Lafrenière (Centre Hospitalier de l'Université de Montréal), Carrie Martin (Canadian Aboriginal AIDS Network), Renee Masching (Canadian Aboriginal AIDS Network), Lyne Massie (Université du Québec à Montréal), Melissa Medjuck (formerly of the Positive Women's Network), Brigitte Ménard, (McGill University Health Centre), Cari L. Miller (formerly of Simon Fraser University), Judy Mitchell (Positive Living North), Gerardo Mondragon (British Columbia Centre for Excellence), Deborah Money (Faculty of Medicine at UBC), Ken Monteith (COCQ-SIDA), Marvelous Muchenje (Women's Health in Women's Hands CHC), Florida Mukandamutsa (CASM), Mary Ndung'u (African Partnership Against AIDS), Valerie Nicholson (Simon Fraser University), Kelly O'Brien (University of Toronto), Nadia O'Brien (McGill University Health Centre and McGill University), Gina Ogilvie (University of British Columbia), Susanna Ogunnaike-Cooke (Public Health Agency of Canada), Joanne Otis (Université du Québec à Montréal), Rebeccah Parry (Simon Fraser University), Sophie Patterson*

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College Research Institute), Anne Wagner (Ryerson University), Sharon Walmsley (University Health Network), Clara Wang (British Columbia Centre for Excellence in HIV/AIDS), Kath Webster (Simon Fraser University), Wendy Wobeser (Queen's University), Denise Wozniak (Positive Living Society of British Columbia), Mark H. Yudin (St. Michael's Hospital), Wendy Zhang (British Columbia Centre for Excellence in HIV/AIDS), Julia Zhu (British Columbia Centre for Excellence in HIV/AIDS). All other CHIROS Research Team Members who wish to remain anonymous.

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## Résumé

Le traitement antirétroviral prévient efficacement la transmission sexuelle et verticale du VIH. Pourtant, certaines femmes vivant avec le VIH affirment avoir des besoins insatisfaits de soins de santé reproductrice. Cette étude a mesuré la prévalence de femmes parlant de leurs objectifs reproductifs avec un prestataire de soins de santé en activité; elle a aussi évalué l'effet du genre du prestataire actuel de soins du VIH sur ces discussions et s'est demandé si le sentiment d'aise était un médiateur. Nous avons analysé les données d'une enquête initiale et de suivi après 18 mois auprès de 533 femmes séropositives recrutées dans l'étude sur la santé sexuelle et reproductive des femmes vivant avec le VIH au Canada (CHIWOS) (2013–2017), une étude participative communautaire, en restreignant l'analyse aux participantes âgées de 16 à 45 ans. Nous avons utilisé l'analyse de médiation causale pour estimer les effets directs et indirects du genre du prestataire de soins du VIH sur les discussions reproductive, en intégrant la médiation et

## Resumen

La terapia antirretroviral previene eficazmente la transmisión sexual y vertical del VIH. Sin embargo, algunas mujeres que viven con VIH informan tener necesidades insatisfechas de servicios de salud reproductiva. Este estudio midió la prevalencia de mujeres que discuten sus objetivos reproductivos con un prestador de servicios de salud, evaluó el efecto del género del prestador de servicios de VIH en esas conversaciones y determinó si la comodidad era un mediador. Analizamos los datos de la línea de base y de una encuesta administrada a los 18 meses a 533 mujeres que viven con VIH inscritas en el Estudio de Cohorte sobre Salud Sexual y Reproductiva de Mujeres Canadienses con VIH (CHIWOS, por sus siglas en inglés) (2013–2017), estudio participativo comunitario, y restringimos el análisis a participantes de 16 a 45 años. Utilizamos análisis de mediación causal para calcular los efectos directos e indirectos del género del prestador de servicios de VIH en las conversaciones sobre salud reproductiva, incorporando los efectos de mediación

les effets de l'interaction de la possibilité pour les femmes de compter sur un prestataire avec qui elles se sentaient à l'aise pour discuter de leurs objectifs reproductifs. Entre l'enquête initiale et l'enquête de suivi après 18 mois, 34,3% (183/533) des femmes avaient évoqué leurs objectifs reproductifs avec un prestataire de soins de santé. Un agent féminin de soins du VIH était associé avec un excès de risque relatif de 1.18 de discussion (IC95%: 0.15, 2.20). L'effet médiateur du confort s'expliquait principalement par le fait que les participantes ayant un prestataire de soins féminin étaient plus à l'aise pour aborder leurs objectifs reproductifs que les participantes traitées par des prestataires masculins, représentant 66% (IC95%: 32%, 99%) de l'effet total. Les conclusions montrent que le genre des prestataires de soins du VIH influe sur le sentiment d'aise des femmes et sur le fait qu'elles parlent ou non de leurs objectifs reproductifs, ce qui doit être pris en compte dans la prestation des soins.

e interacción en las mujeres que tenían a un prestador de servicios con quien se sentían cómodas discutiendo sus objetivos reproductivos. Entre la línea de base y la encuesta de seguimiento administrada a los 18 meses, el 34.3% (183/533) de las mujeres discutieron sus objetivos reproductivos con un prestador de servicios de salud. Tener a una mujer como prestadora de servicios de VIH estaba asociado con un exceso de riesgo relativo de 1.18 (ERR) de discusión (IC de 95%: 0.15, 2.20). El efecto mediador de comodidad fue explicado principalmente por el hecho de que las participantes con prestadoras de servicios se sentían más cómodas discutiendo sus metas reproductivas comparadas con las participantes con prestadores de servicios, a lo cual se le atribuye el 66% (IC de 95%: 32%, 99%) del efecto total. Los hallazgos corroboran que el género de quienes prestan servicios de VIH afecta la comodidad de las mujeres y el hecho de que discutan o no sus objetivos reproductivos, lo cual se debe reconocer y abordar en la prestación de servicios.