Knowledge of and Opinions on HIV Preexposure Prophylaxis Among Front-Line Service Providers at Canadian AIDS Service Organizations

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Abstract

Oral daily tenofovir/emtricitabine (Truvada) is approved in the United States for HIV preexposure prophylaxis (PrEP) but has generated controversy in the media and within HIV-affected communities. We conducted an online survey about PrEP-related knowledge, experience, opinions, and learning needs, and received 160 responses from service providers at Canadian AIDS Service Organizations. Respondents were cautiously optimistic about PrEP and 48.8% believed that PrEP warranted Health Canada approval. In multivariable logistic regression, support for PrEP approval was associated with more years working in HIV (odds ratio=1.89 per decade, 95% CI=1.10, 3.25), low baseline familiarity with PrEP (OR=3.24, 95% CI=1.01, 14.41), and knowing someone who had used PrEP (OR=4.39, 95% CI=1.28,15.08). Participants major concerns about PrEP were similar to those highlighted in other publications, and some issues specific to certain target populations were raised. Several participants (26.2%) had been asked about PrEP in the past year and 10.6% knew of one or more Canadian who had used PrEP. Despite clients' interest, most participants thought that they (60.6%) or their organization (63.1%) did not have enough current knowledge about PrEP, highlighting the need for further education on this novel HIV prevention strategy.

Introduction

PREEXPOSURE PROPHYLAXIS (PrEP) is a controversial new HIV prevention technology involving daily use of oral tenofovir/emtricitabine (TDF/FTC or Truvada) by HIV-negative individuals. PrEP was associated with a 44% reduction in HIV infections among men who have sex with men in the iPrEx trial,¹ a 75% reduction among heterosexual serodiscordant couples in the Partners PrEP trial,² and a 62.2% reduction in heterosexual transmission in the TDF2 trial.³ Although both the FemPrEP trial and the oral tenofovir arm of the ongoing VOICE trial were stopped early due lack of efficacy, these divergent trial results were likely due to suboptimal adherence.^{4,5} The U.S. Food and Drug Administration (FDA) thus approved Truvada PrEP for preventing sexually acquired HIV infection in high-risk individuals,⁶ and the CDC has released interim guidelines for use of PrEP by both men who have sex with men (MSM) and serodiscordant couples (SDCs).^{7,8}

PrEP has sparked considerable debate among AIDS service organizations (ASOs), community-based organizations, and HIV-affected populations. The AIDS Healthcare Foundation, for example, spearheaded an anti-PrEP campaign called "No Magic Pills,"⁹ whereas the AIDS Vaccine Advocacy Coalition has taken an avidly pro-PrEP stance.¹⁰ Indeed, the FDA panel itself was divided on its decision.^{11,12} Although studies among at-risk populations and healthcare providers worldwide have identified substantial interest in PrEP,^{13–21} there is a dearth of information about the opinions of community-based organizations on this controversial subject. These groups are poised to play important roles in PrEP implementation including promotion, counseling, and adherence support and will influence uptake of this intervention in the populations they serve.²² Therefore, it is important to understand their opinions and learning needs regarding PrEP. Prior to FDA approval of Truvada for PrEP, but after iPrEx trial data were published, we surveyed front-line providers from ASOs across Canada to assess their readiness for this prevention method to become more widely available.

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Materials and Methods

A 30-item online survey was administered to front-line service providers of Canadian ASOs using the Fluid Surveys website. Participants were recruited via the website, social media, and newsletters of CATIE (Canadian AIDS Treatment Information Exchange), a major national knowledge exchange organization whose distribution list reaches over 3,500 individuals and organizations including public health units, ASOs, national partners, and community-based organizations. The survey was also advertised on the websites of CATIE's partner organizations including COCQ-SIDA (Coalition des Organismes Communautaires Québécois de Lutte Contre le SIDA), Portail VIH, and the Pacific AIDS Network. Individuals were invited to participate if they self-identified as working for a Canadian organization interested in HIV prevention and treatment and were involved in one or more of the following activities: direct one-on-one counseling of clients regarding HIV, facilitating HIV-focused support/counseling groups, HIV-related phone information or support, preparing educational materials about HIV, delivering HIV education and workshops, or community outreach. Surveys were collected between January 12 and May 11, 2012.

The survey instrument was organized into four sections including demographics, previous knowledge and experience with PrEP, opinions on PrEP and issues surrounding its use, and learning needs. Because no baseline knowledge of PrEP was necessary, objective information about PrEP was provided by citing data from existing clinical trials and statements from relevant literature. The survey was conducted in both French and English. Survey items included a mix of open-ended, multiple choice and Likert scale questions. The survey instrument was pilot tested on four individuals from local ASOs and no financial incentive was provided.

The primary objective was to ascertain the level of support for Health Canada approval for PrEP among respondents, defined as the proportion answering "yes" to the following question: "According to one study among MSM, oral PrEP provided 44% protection against HIV infection overall and 73% protection in participants who used PrEP consistently (i.e., took the medication on a regular schedule and did not miss pills). Other studies show that PrEP provides a similar level of protection among heterosexual men and women. Considering this level of protection, do you believe Health Canada should approve PrEP for use in Canada?"

A secondary objective was to identify respondent characteristics associated with support for PrEP approval using logistic regression analysis. Because the purpose of this analysis was exploratory, a multivariable model was built using backward selection. After removal of variables due to collinearity, individual variables were removed one at a time until all remaining variables made significant partial contributions to predicting this outcome using an $\alpha = 0.05$ significance threshold. Additional secondary objectives were to assess respondents' knowledge and experience with PrEP and to characterize their opinions on various aspects of PrEP rollout.

Statistical analyses were conducted using SAS version 9.0. The study protocol was approved by the Research Ethics Board of the University of Toronto, Canada.

TABLE 1. RESPONDENT DEMOGRAPHICS

Variable	Value ^a
Location	
Maritimes	12.5
Quebec	18.1
Ontario	33.8
Prairies	17.5
British Columbia	14.4
Territories	1.2
Sex	
Male	37.5
Female	60.0
Other (trans, "genderqueer")	1.9
Age	40.5 (30, 49)
Years working in HIV service industry	5 (2, 10)
Daily work involves	
Education and workshops	69.4
Preparing educational materials	66.2
Community Outreach	61.2
One-on-one counseling with clients	57.5
Phone information and support	56.9
Facilitating support/counseling groups	33.1
Administration	27.5
Job titles	
Outreach, advocacy or support	26.9
Coordination of front-line programs	26.9
Education	15.0
Leadership or administration	13.1
Healthcare provider	12.5
Other	4.4
Organization's focus	
People living with HIV/AIDS	13.1
People at risk for HIV	13.1
Both	73.8
Populations served	
Men who have sex with men	91.2
People who use injection drugs	84.4
Women	83.1
At-risk youth	80.0
Sex workers and their clients	72.5
Trans communities	61.9
Immigrants/newcomers	61.2
People from countries where HIV is endemic	58.1
Prison inmates	55.6
Ethnoracial/racialized communities	51.2
Familiarity with PrEP ^b	
Very familiar	19.4
Somewhat familiar	64.4
Not at all familiar	15.6
Have been asked about PrEP in the past year	26.2
Number of occasions	3 (2, 7.25)
Have suggested PrEP in the past year	10.6
Number of occasions	2 (1, 3)
Know anyone in Canada who has used PrEP	10.6
Median number	2 (1, 4)

^aValues shown are median (interquartile range) or frequency in percentage.

^bLevels of familiarity with Preexposure Prophylaxis (PrEP) were defined in the survey as follows: very familiar (e.g., I am aware of the details of recent clinical trials); somewhat familiar (e.g., I am aware of PrEP and the existence of clinical trials but not of their details); not at all familiar (e.g., this is my first time hearing about it).

FIG. 1. Minimum acceptable efficacy for preexposure prophylaxis (PrEP) according to opinion on Health Canada Approval. Frequency histogram showing the distribution of minimum acceptable efficacy reported by participants. Respondents were divided based on whether they answered yes (“yes”) or no or maybe (“no”) to the question. According to one study among men who have sex with men (MSM), oral PrEP provided 44% protection against HIV infection overall and 73% protection in participants who used PrEP consistently (i.e., took the medication on a regular schedule and did not miss pills). Other studies show that PrEP provides a similar level of protection among heterosexual men and women. Considering this level of protection, do you believe Health Canada should approve PrEP for use in Canada?”

Results

Overall, 226 responses were received. As a consequence of our broad strategy for survey dissemination, it was not possible to specify an exact denominator or estimate a response rate. One response, from July 27, 2012, was omitted from analysis since it was received after the prespecified survey period and after FDA approval of Truvada. Of the 225 remaining responses, 160 were complete and were included in the analysis.

Demographics, PrEP knowledge of respondents, and PrEP experience of respondents are summarized in Table 1. Participants had worked in the field of HIV for a median (interquartile range, IQR) of 5 (2, 10) years. Most respondents were female (60.0%), worked for organizations serving both people living with HIV / AIDS and people at risk for HIV (73.8%), and were involved in work activities with the potential to impact client perceptions of PrEP such as education and workshops (69.4%) and community outreach (61.2%). Based on job titles, the majority of respondents (81.3%) held positions as front-line workers or coordinators of service programs. This number includes healthcare workers, who made up 12.5% of the study population. Leadership or administrative roles were held by 13.1% of respondents. The populations most frequently targeted by respondents’ organizations were MSM (91.2%), injection drug users (IDUs, 84.4%), and women (83.1%). Most (64.4%) respondents indicated that they were somewhat familiar with PrEP (“I am aware of PrEP and the

existence of clinical trials but not of their details”) and 15.6% had never heard of PrEP prior to participation in the survey. Some respondents had prior experience with PrEP in their work; 26.2% had been asked about PrEP by at least one client in the past year, 10.6% had suggested PrEP as an HIV prevention method to at least one client in the past year, and 10.6% knew of at least one person in Canada who had used PrEP.

Half (48.8%) of the respondents believed that the efficacy reported in the iPrEx and Partners PrEP trials was enough to warrant approval by Health Canada. When asked, “What is the minimum level of protection you would consider reasonable for PrEP use to be recommended to individuals at high risk of HIV infection?” respondents provided a wide range of minimum acceptable efficacy levels from zero to 100%, with a median (IQR) of 75% (50, 80). Of note, the “zero” response may have been an error, as closer scrutiny of this respondent’s survey suggested they did not support PrEP implementation under any circumstances; the next lowest minimum acceptable efficacy level was 1%, provided by one respondent, followed by 10%, provided by three respondents. There was a strong inverse correlation between the minimum acceptable efficacy level and support for Health Canada approval of PrEP with $OR=0.83$ (0.73, 0.96), $p=0.009$, per 10% increase in this level. This is shown graphically in Fig. 1; the median (IQR) level of efficacy preferred by those not supporting Health Canada approval was 77.5% (50, 85) versus 60% (40, 80) for those supporting it ($p=0.004$, Wilcoxon rank sum test).

TABLE 2. RESPONDENT CHARACTERISTICS ASSOCIATED WITH FAVORING HEALTH CANADA APPROVAL FOR PREEXPOSURE PROPHYLAXIS

Variable	Univariate		Multivariate	
	Odds ratio (95% CI)	p-value	Odds ratio (95% CI)	p-value
Age (per decade)	1.02 (0.77, 1.34)	0.90		
Time working in HIV (per decade)	1.61 (0.97, 2.67)	0.06	1.89 (1.10, 3.25)	0.02
Sex ^a				
Male	1.00			
Female	1.17 (0.62, 2.22)	0.63		
Baseline familiarity with PrEP				
Very familiar	1.00		1.00	
Somewhat familiar	1.87 (0.81, 4.31)	0.14	2.71 (1.09, 6.76)	0.03
Not familiar	2.20 (0.74, 6.50)	0.15	3.24 (1.01, 10.41)	0.048
Language of response				
English	1.00			
French	0.46 (0.18, 1.14)	0.09		
Region of Canada				
Atlantic	1.00			
Quebec	0.37 (0.11, 1.20)	0.10		
Ontario	1.15 (0.41, 3.25)	0.79		
Prairies	0.61 (0.19, 1.95)	0.41		
B.C. and Territories	0.96 (0.30, 3.08)	0.94		
Quebec				
No	1.00			
Yes	0.39 (0.17, 0.93)	0.03		
Clients primarily served				
People at risk for HIV	1.00			
People living with HIV/AIDS	0.68 (0.20, 2.30)	0.54		
Both	0.91 (0.36, 2.30)	0.84		
Ever asked by client about PrEP	1.37 (0.67, 2.77)	0.39		
Knowing someone in Canada who has used PrEP	3.45 (1.06, 11.20)	0.04	4.39 (1.28, 15.08)	0.02

^aTwo F-to-M trans respondents classified here as male.

Respondent characteristics associated with support for PrEP are summarized in Table 2. In the multivariable model, an increased duration of HIV work experience [odds ratio, OR=1.89 per decade, 95% confidence interval (CI)=1.10, 3.25], decreasing levels of baseline familiarity with PrEP (OR=3.24 for no familiarity, 95% CI=1.01, 10.41), and knowing somebody who had used PrEP (OR=4.39, 95% CI=1.28, 15.08) were each independently associated with an increased odds of favoring Health Canada approval.

To further characterize opinions on PrEP, respondents were given a series of statements and asked to rate their level of agreement on a five-point Likert scale (Fig. 2). The statement generating the least agreement (5.0% agreeing or strongly agreeing) was "PrEP is dangerous and should not be pursued further," suggesting that most respondents generally saw some utility for PrEP. In fact, 38.8% agreed/strongly agreed that PrEP "should be made more widely available as soon as possible," 56.9% saw PrEP as an "appropriate use of healthcare resources," and 63.8% believed we had an "ethical obligation to make PrEP available." Respondents were cautious in their optimism, however, and 53.8% agreed/strongly agreed that while PrEP may be useful, it was "not ready to be made widely available," and 55.6% agreed/strongly agreed that PrEP had the "potential to do more harm than good if not carefully implemented." When asked if some of their own HIV-negative clients would benefit from PrEP, 27.5% answered yes, 59.4% answered maybe, and 5.6% answered no.

Front-line providers were asked to highlight clients with whom they had discussed PrEP in the past year. Clients were most commonly MSM, individuals in HIV SDCs, SDCs trying to conceive a child, and drug users. Respondents were also asked to indicate, from a list, which populations they thought would benefit most from PrEP. The most common responses were HIV-negative individuals within an SDC (83.1%), individuals who regularly engage in unprotected sex (71.2%), individuals who exchange sex for money, goods, or housing (70.0%), IDUs or other people who may share needles (67.5%), and individuals who have sex under the influence of drugs (62.5%), although high levels of support were seen for most groups considered.

Respondents were asked to rank how important particular concerns were to them in forming their opinions on PrEP. They were asked to select items from a list generated from previous literature.^{22–27} Concerns ranked first or second most often were the level of protection provided by PrEP (60.6%), the risk for development of antiretroviral drug resistance (41.9%), side effects and their severity (23.1%), and the possibility that PrEP use may increase risk-taking behaviors (22.5%) (Fig. 2). When asked to provide any comments or concerns regarding PrEP, common themes emerged related to safety and side effects, particularly in the context of hepatitis C and pregnancy (mentioned by $n=35$ respondents), adherence to both dosing and monitoring ($n=31$), the possibility of risk compensation ($n=30$), the risk of drug resistance ($n=19$), cost and equitable access ($n=18$), implementation and

FIG. 2. Respondent's opinions regarding PrEP. **(A)** Percentage of respondents who agreed or strongly agreed (dark gray), were neutral (medium gray), or disagreed or strongly disagreed (pale gray) to each of the listed statements. **(B)** Percentage of respondents ranking each listed concerns as first or second most important.

monitoring ($n=16$), concern that PrEP would take focus away from other prevention efforts or trivialize HIV in the media ($n=11$), and the risk for stigmatization of PrEP users ($n=7$). Concern was also raised over use of PrEP in some transient populations ($n=7$), such as IDUs and sex workers.

The majority of respondents believed that they (60.6%) or their organization (63.5%) did not have enough current knowledge about PrEP. They were most interested in receiving more information about PrEP through workshops (71.2%), websites (62.5%), and pamphlets/brochures (60.6%). Very few (6.9%) indicated that they did not need any further information about PrEP. Lastly, we asked respondents what role, if any, they saw their organization playing in PrEP rollout. Most saw a role for themselves in community education and outreach (91.9%), counseling/individual support services to facilitate adherence (68.1%), and facilitating clients' access to PrEP through advocacy (66.2%). Only 3.1% responded that they saw no role for their organization in PrEP implementation.

Discussion

Given the conflicting viewpoints on PrEP among HIV-affected communities and decision-making authorities,^{11,12} we gathered the opinions of front-line service providers from ASOs across Canada in an online survey. Although most respondents expressed opinions that were generally supportive of PrEP, only half expressed support for Health Canada approval.

The reasons for the incomplete endorsement of regulatory approval in our study are likely multifactorial. Study participants raised concerns commonly identified in published literature including safety, adherence, drug resistance, cost, equitable access, stigmatization, medicalization of prevention, and risk compensation.^{22–27} The potential for deemphasizing traditional HIV prevention strategies is an additional important consideration raised by the ASO sector in our study. Overall, our findings of cautious optimism in the ASO sector are in keeping with previous studies of PrEP

opinions among healthcare providers.^{14,15,28} Notably, this study was completed before final results from the FEM-PrEP and VOICE trials were reported, in which oral TDF, oral TDF/FTC, and topical tenofovir gel were found nonefficacious for HIV prevention, likely due to poor adherence. It is difficult to speculate on how respondents' overall opinions may have been shaped by these reports, because preliminary negative results were publicly available at the time of our study (although not explicitly provided in our questionnaire), and because both trials were conducted in heterosexual women in African countries with generalized epidemics.

As expected, we observed an inverse relationship between the minimum acceptable PrEP efficacy level and support for Health Canada approval of PrEP, with an OR=0.83 (95% CI=0.73, 0.96) per 10% increase in this level, confirming that efficacy of the intervention is a critical consideration for regulatory approval. In fact, the level of protection was identified as the most important consideration for the majority (60.6%) of respondents. Though the median desired PrEP efficacy level was 75%, respondents provided the full range of values for this level from 0 to 100% (however, as noted above, the "0" and "1%" responses were provided by one individual each, perhaps due to error or misinterpretation of the question, with the next lowest values being 10%). These findings reflect the diversity of opinion on this controversial topic; some may see value in any intervention that can decrease HIV incidence, while others require complete protection before a new product should gain licensure. Interestingly, support for PrEP approval was independently associated not only with knowing somebody who had used PrEP and years of HIV work experience, but also with a lack of baseline PrEP familiarity. The latter finding contrasts with a study of healthcare providers in the southern United States showing that willingness to prescribe PrEP correlated with increasing PrEP knowledge.¹⁵ Reasons for this difference are unclear and might be better explored using qualitative methods.

It was also notable that respondents did not discriminate a great deal between which populations might be most appropriate for PrEP. Most of the high-risk groups listed were considered appropriate for PrEP use by 55–83% of respondents. However, the efficacy of PrEP in the context of injection drug use has not yet been demonstrated, though a randomized controlled trial is currently underway in Thailand.²⁹

Approximately 25% of respondents had been asked about PrEP by at least one client in the past year, suggesting that there are individuals in Canada with an active interest in using PrEP. In fact, 11% of study participants knew of at least one person in Canada who had used PrEP already. To our knowledge, this is the first published evidence confirming off-label PrEP use in Canada. Yet most respondents believed that they (60.6%) or their organization (63.1%) did not have enough current knowledge about PrEP. A survey lead by the Canadian Public Health Association in 2011 yielded similar results, where PrEP was one of the HIV prevention methods participants knew the least about.³⁰ Clearly, there is a discrepancy between the frequency with which ASOs in Canada are already being consulted about PrEP and their self-reported ability to provide accurate information on the topic to the public. In an era of rapidly emerging research in this field, this is a key finding of our study, highlighting the need

for engaging ASOs with up-to-date information about PrEP and other biomedical HIV prevention technologies. It is also noteworthy that the great majority of respondents saw some role for their organization in PrEP rollout, including education, adherence support, and advocacy. These findings suggest the need for system-wide approaches to integrating ASO support with clinical services in establishing PrEP programs in the future.

Our study has limitations that warrant consideration. We solicited responses through an existing network of ASOs, such that our findings may not be reflective of the entire population of ASO workers in Canada. However, CATIE is the major HIV knowledge translation organization in Canada, and we obtained responses from all regions of the country and in both official languages. Furthermore, because we relied on participant self-report, claims about existing PrEP use in Canada could not be externally substantiated.

Front-line service providers from ASOs are an important primary source of information and counseling for many individuals at risk of acquiring HIV. Although respondents were cautiously optimistic about PrEP, our findings highlight the diversity of opinion on this controversial topic and the need to furnish ASOs with up-to-date PrEP information. Active efforts to engage the ASO sector in meaningful discussions about PrEP will be important to future efforts to make this novel HIV prevention strategy more widely available.

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