HHS Public Access

Author manuscript

Glob Public Health. Author manuscript; available in PMC 2020 August 01.

Published in final edited form as:

Glob Public Health. 2019 August ; 14(8): 1098–1111. doi:10.1080/17441692.2019.1571090.

Knowledge and willingness to use pre-exposure prophylaxis among men who have sex with men in Northeastern Brazil

Laio Magno[a,b], **Inês Dourado**[b], **Cassandra Sutten Coats**[c], **Daniel Wilhite**[c], **Luís Augusto V. da Silva**[b,d], **Oluwadamilola Oni-Orisan**[c], **Julianna Brown**[c], **Fabiane Soares**[b], **Lígia Kerr**[e], **Yusuf Ransome**[f], **Philip Andrew Chan**[g], and **Amy Nunn**[c]

[a]Universidade do Estado da Bahia, Salvador, Bahia, Brasil

[b]Instituto de Saúde Coletiva/Universidade Federal da Bahia, Salvador, Bahia, Brasil

[c]Brown University School of Public Health, Providence, RI, USA

[d]Instituto de Humanidades, Artes e Ciências, Salvador, Bahia, Brasil

[e]Departamento de Saúde Comunitária, Universidade Federal do Ceará, Fortaleza, Brasil

[f]Social and Behavioral Sciences, Yale School of Public Health, New Haven, CT

[g]Division of Infectious Diseases, The Miriam Hospital, Brown University, Providence, RI, USA

Abstract

Few studies evaluate knowledge and willingness to use pre-exposure prophylaxis (PrEP) among men who have sex with men (MSM) in middle-income countries. Brazil added PrEP to public drug formularies in December 2017, but little is known about local knowledge and attitudes about PrEP among MSM outside metropolitan areas in Southern Brazil. The cross-sectional HIV Surveillance Survey Project in Brazil estimates HIV and STD prevalence among MSM in 12 state capitals. Among 32 participants at the Salvador, Bahia study site, we used qualitative interviews to assess knowledge, willingness, and barriers to PrEP use among MSM; few MSM had previous knowledge of PrEP and were willing to use PrEP. Clinical, behavioral, social, and structural factors influencing participants' knowledge and willingness to take PrEP included concerns about efficacy and side effects, access to culturally congruent services for MSM, and stigma. Some participants reported that learning about PrEP online positively influenced their willingness to use PrEP. Participants' opinions about PrEP's contribution to risk compensation varied. Interventions to provide culturally congruent care and destigmatize PrEP for MSM at high risk for HIV

Corresponding author: Laio Magno, Universidade do Estado da Bahia/Departamento de Ciências da Vida, Campus 1, Salvador, Bahia, Brasil. laiomagnoss@gmail.com.

Authors' contributions: This manuscript has not been submitted or accepted for publication elsewhere. All authors contributed to the concept of the paper and data analysis. LM, ID, CSC, DW, LS, and AN interpreted the results and were responsible writing the final version of the manuscript. FS helped with a draft version of the manuscript. LK and PC revised and contributed to the final version of the manuscript. OO and JB were on-site investigators that collected, coded, and analyzed the data. All authors have read and approved the paper, meet the criteria for authorship as established by the International Committee of Medical Journal Editors, believe that the paper represents honest work, and are able to verify the validity of the results reported.

Declaration of interest: None of the authors has any competing interests (including financial and other relationships) to report. None of the authors has any competing interests (including financial and other relationships) to report. The authors have declared that no competing interests exist.

acquisition, particularly those conducted collaboratively with Brazil's civil society movement, may enhance the public health effort to expand access to PrEP in Brazil.

Keywords

PrEP; men who have sex with men; HIV care continuum; STD/STI; Brazil

Introduction

In 2015, 36.7 million people were living with HIV (United Nations Programme on HIV/AIDS [UNAIDS], 2016a). The HIV epidemic disproportionately affects men who have sex with men (MSM), and in Latin America and the Caribbean, MSM represent 30% of new HIV infections (Beyrer et al., 2012; UNAIDS, 2016b). Brazil accounts for 40% of all new HIV infections in Latin America and has the largest number of people living with HIV in the region (UNAIDS, 2016b). In Brazil, MSM account for approximately 0.6% of the population, though respondent driven sampling surveys in major Brazilian cities showed that HIV prevalence among MSM increased from 14.2% in 2009 to 18% in 2016 (Kerr et al., 2018; Kerr et al., 2013; UNAIDS, 2016a). As of 2016, MSM accounted for 47.3% of AIDS diagnoses among the general population of men in Brazil (Ministério da Saúde no Brasil, 2017a). Despite the disproportionate impact of HIV among MSM, a recent study on HIV risk-related behaviors found that MSM increasingly reported low HIV knowledge, low HIV risk perception, low rates of STD testing and counseling, and high rates of behavior associated with increased risk for HIV (i.e. unprotected receptive anal sex and sex with multiple partners) between 2009 and 2016 (Guimaraes et al., 2018). Additionally, MSM younger than 25 years old reported higher rates of behavior associated with increased HIV risk compared to MSM older than 25 (Guimaraes, et al., 2018).

In recent years, HIV prevention has become increasingly biomedically oriented. Pre-exposure prophylaxis (PrEP) is a once-a-day dose of antiretroviral medication (tenofovir/emtricitabine – TDF/FTC) that is designed to decrease the risk of HIV acquisition for HIV negative people. PrEP's efficacy in reducing HIV acquisition has been demonstrated in clinical trials (Baeten et al., 2012; Grant et al., 2010; Thigpen et al., 2012; Van Damme et al., 2012), demonstration projects (Cohen et al., 2015), and in real-world clinical settings (Chan, Glynn, et al., 2016; Chan, Mena, et al., 2016; Koester and Grant, 2015; Levine et al., 2016; Marcus et al., 2016; Montgomery et al., 2016; Parker et al., 2015).

In 2014, the World Health Organization (WHO) recommended PrEP for select populations at high risk for HIV acquisition, including MSM. WHO broadened their recommendation in 2015 to include all people at "substantial risk" of HIV infection (World Health Organization, 2015). While more than 70,000 people have initiated PrEP in the United States (HIV, 2015; Siegler et al., 2018), access to PrEP remains extremely limited in most low and middle-income countries (Cáceres, Bekker, & Godfrey-Faussett, 2016; Cáceres, Borquez, Klausner, Baggaley, & Beyrer, 2016; Young and McDaid, 2014). PrEP is not yet commercially available or provided to scale in many public clinics and public health settings in developing countries. However, emerging evidence from PrEP demonstration projects have found high

rates of PrEP uptake, retention, and adherence in low and middle-income countries, including Brazil (Grinsztejn et al., 2018; Hoagland, Moreira, et al., 2017), Kenya, and Uganda (Baeten et al., 2016; Haberer et al., 2017).

New HIV prevention technologies, including PrEP, have the potential to dramatically reduce the global HIV disease burden. However, the potential of PrEP to have demonstrable impacts on population-level HIV transmission depends on its optimal deployment in public health settings, which requires addressing many of the complex social, structural and clinical factors that influence access to essential medicines. While these issues have been explored in detail in the US, little is understood about how these complex factors may influence access to and uptake of PrEP in resource-limited settings.

Brazil has been an early adopter of innovative HIV strategies to promote access to essential medicines since the 1990s, delivering universal access to antiretroviral therapy since 1996 through *Sistema Único de Saúde* (SUS), the Brazilian national public health system (Berkman, Garcia, Munoz-Laboy, Paiva, & Parker, 2005; Nunn, 2009; Nunn, Fonseca, Bastos, Gruskin, & Salomon, 2007; Nunn, da Fonseca, Bastos, & Gruskin, 2009). Brazil's policies culminated in precipitous declines in AIDS-related mortality (Teixeira, Vitoria, & Barcarolo, 2004). Brazilian sites also contributed to the international iPrEX study - a randomised clinical trial demonstrating the efficacy of PrEP among MSM (Grant, et al., 2010). PrEP Brasil, a demonstration study carried out in four Brazilian cities -São Paulo, Rio de Janeiro Porto Alegre and Manaus among MSM and transgender women, found keen interest in PrEP (Hoagland, De Boni, et al., 2017; Hoagland, Moreira, et al., 2017) and high PrEP adherence rates after 48 weeks of use (Grinsztejn, et al., 2018).

While Brazil has generally been an early adopter of biomedical prevention and treatment technologies, PrEP implementation in Brazil has been somewhat delayed. In late 2017, the Brazilian Ministry of Health issued clinical guidelines for PrEP use, in part in response to demands from Brazil's vibrant civil society movements (Collucci, 2017). After adopting PrEP guidelines in early 2017, Brazil added PrEP to its public drug formularies in December 2017 (Ministério da Saúde no Brasil, 2017b, 2017c). The implementation of PrEP also sought to respond to the global goals of UNAIDS to reduce HIV transmission significantly by 2020. Beyond implementing biomedical strategies in HIV prevention, it is imperative that policies continue to focus on human rights and vulnerability reduction, as Brazil has historically done throughout the HIV epidemic (Steffner and Parker, 2016).

Until October 2018, PrEP was available at 65 clinics and access will eventually be expanded to other public health clinics (Ministério da Saúde no Brasil, 2018). However, PrEP rollout has been much slower than expected. While PrEP has the potential to reduce HIV transmission in Brazil, little is understood about the feasibility or acceptability of implementing PrEP programs in Brazil's public health system, particularly outside of Brazil's largest metropolitan areas of São Paulo and Rio de Janeiro. Moreover, there is a dearth of information regarding the factors that may influence PrEP uptake in Brazil, particularly regarding social and structural factors.

Salvador is Brazil's fourth largest city, has low per-capita income (Instituto Brasiliero de Geografica e Estatistica, 2016), and has increasing rates of HIV infection among MSM (Observatório Nacional de Políticas de AIDS, 2016; Kerr, et al., 2018). Drawing on a sample from a large HIV Surveillance study, we explored knowledge of and willingness to use PrEP among young MSM in Salvador. We additionally explored social, structural and behavioral factors that may impact acceptability and uptake of PrEP in Brazil's public clinics.

Methods

Sample Setting

Semi-structured interviews were conducted with 32 MSM who participated in the Salvador site of the 12-city Brazilian HIV Surveillance Survey Project. This Survey is a national, biological, and behavioural cross-sectional study estimating HIV and sexually transmitted infection (STI) prevalence among MSM in 12 of Brazil's capitals including Salvador, Bahia. Purposive sampling was used to recruit participants from the Survey to participate in the qualitative interviews; individuals were asked to participate in qualitative interviews based on their age, educational attainment, and race. At the time of recruitment, eligible participants were assigned male at birth and identified as men, reported oral or anal sex with another man in the last 12 months, and were concurrently participating in the HIV Surveillance Survey Project. The selection process was based on the survey responses. Interviews took place in private rooms at the Survey headquarters from July to September 2016. All participants provided written informed consent. The study protocol was approved by the Research Ethics Committee of the Federal University of Ceará (UFC).

Data Collection

We conducted semi-structured interviews exploring knowledge about and willingness to use PrEP in addition to the facilitators and barriers to accessing PrEP care among MSM. Interview guides were informed by current literature and our experience conducting research and serving this population. Interview guides included questions regarding previous knowledge about PrEP, sexual risk behaviours, perceived risk for HIV acquisition, stigma associated with using PrEP, and perceived barriers to accessing PrEP-related medical services. We conducted interviews until achieving saturation, which was determined as the point at which no new concepts emerged.

Analysis

All interviews were conducted in Portuguese, recorded digitally, translated, and professionally transcribed. We used a grounded theory approach to inform data analysis (Glaser and Strauss, 1967). Trained research assistants conducted thematic analysis of the data (Attride-Stirling, 2001; Ryan and Bernard, 2000). We analyzed transcripts and related field notes, and identified deductive codes based on a review of consistent themes that emerged from the literature. Next, we used inductive codes to identify new factors in the transcripts that may not have been highlighted by the existing literature. The content analysis was used to identify categories related to key themes from each interview. Data were reviewed and discussed by authors, and key themes were discussed with the entire study team.

Results

Sociodemographics, knowledge, and willingness to use PrEP

Participants' average age was 26; 25 participants self-identified as Black and seven were unemployed. Participants were overwhelmingly MSM of low socio-economic status; the average monthly wage in Brazilian *Reais* was R$948– approximately $285 USD. The majority (25) had previously undergone HIV testing; six reported previous STIs, and three were diagnosed with HIV during the course of the parent surveillance study (Table 1). Fewer than one-third of participants knew about PrEP before the study. Among those who had previously heard of PrEP, the main sources of this knowledge came from the internet, newspapers, online "hookup" apps, and friends. Less than half of MSM reported being willing to use PrEP (Table 1).

Interview results

Several important themes emerged in interviews. Clinical, social and structural barriers affected participants' willingness to use PrEP. Clinical barriers to PrEP use included doubts about PrEP's efficacy and perceived side effects. Many participants' low self-perceived HIV acquisition risk also contributed to limited willingness to use PrEP. Structural barriers included limited access to culturally congruent health services for MSM. Social barriers entailed fear of disclosure of participants' homosexual orientation, fear of being perceived as HIV-positive, fear of discrimination, and fear of being perceived as sexually promiscuous. Internet resources about PrEP and participants reduced fear associated with having sex, positively impacted many participants' willingness to use PrEP. Participants reported different opinions about whether PrEP may contribute to risk compensation. These themes are discussed in detail below.

Clinical barriers to PrEP use

PrEP Knowledge: Doubts about PrEP's efficacy—Despite PrEP's proven efficacy in reducing HIV transmission, many participants expressed doubt about its efficacy. One participant mentioned he would not use PrEP, noting "condoms are safer." He expressed a common doubt about PrEP's effectiveness: "I want to know if HIV transmission is 100% guaranteed, because if it isn't, then there's always going to be a gap, and people are going to get infected in the same way." (37 years old, black, divorced, HIV-negative).

Perceived side effects—Some participants also expressed concerns about potential side effects: "I just decided that I would not use PrEP… I think other people will probably do the same after knowing about side effects." (28 years old, white, single, HIV-negative).

Other participants noted they would agree to use PrEP on a trial basis and would continue to use it depending on their experiences with side effects:

> The side effects are very concerning. I would only use PrEP for prevention, but the reality is that I am conscious of what I do. I am not going to take something that's harmful because of side effects … But I would try it out. In the event that they [side effects] don't happen, I would continue. (27 years old, black, stable union status, HIV-negative)

However, some interviewees claimed that they would take PrEP in spite of any perceived side effects. One participant noted: “I would be scared of the side effects, but I think it is certainly worth taking the medicine.” (20 years old, white, single, HIV-negative).

Perceived HIV acquisition risk—Many participants did not perceive themselves at risk of HIV acquisition; this influenced participants’ interest and willingness to take PrEP. For example, when asked to rate his own risk of HIV infection, one participant noted:

> I think that the people that really are at risk are sex workers... people that are exposed to those risks. Am I completely at-risk? No, because I am an aware person. Of course, I slip up. But I think that I don’t run the risks like those people. (24 years old, *pardo* – brown skin color –, HIV-negative).

Several participants did not perceive themselves in risk of HIV acquisition because they were engaged in monogamous partnerships, citing this as a primary reason they were not interested in taking PrEP.

> I would not be interested in PrEP because I don’t see the need... maybe also due to the side effects. But also because I have a stable partner. We don’t use a condom for all of our sexual relations, but I only have relations with him, and he with me. At least that is what I think… (24 years old, black, single, HIV-negative)

Structural barriers

Lack of convenient access to PrEP services—Patients also noted that transportation and waiting times often hinder their access to public health clinics. Long wait times at Brazil’s publicly funded health centers, limited access to public transportation, and long distances from less affluent neighborhoods to publicly funded health clinics were reported as significant barriers to seeking PrEP:

> Looking for medication depends on where you live ... You have to figure out the CEDAP [center for HIV care] operating hours, which has its schedules. Then you have the issue of transportation. It would be complicated. (30 years old, black, single, HIV-positive).

Social barriers

Limited availability of culturally competent health care for MSM—While some participants were pleased about PrEP’s availability in SUS, there was a common fear of soliciting PrEP through publicly funded health clinics because of fear of discrimination related to sexual orientation:

> Public policy in Brazil for the LGBT community is very precarious. In the health centre where I went, no one wanted to attend to me when I came with my husband. No one would agree to see me. I gave up on using SUS because every time that you say that you are gay or if you appear that you are gay---my God! The treatment of the LGBT population is horrible. I don’t want to be treated like a dog. I got tired of it. (25 years old, white, single, HIV-negative).

> I had a problem and I going to HIV/AIDS Reference Health Centre. There I saw people saying that I also felt trapped there, understood? I felt an indifference about who was paying attention to me, he always referred to syphilis as something that killed me, that would kill me, his ends with people not looking for this service... (19 years old, *pardo* – brown skin color –, HIV-negative)

Fear of disclosure of sexual orientation—Many participants noted that storage and daily use of PrEP might lead to inadvertent disclosure of their sexual orientation to friends and loved ones. One participant noted:

> It would really be embarrassing. Not for me, I would even take it [PrEP]. But my mom has a very different way of thinking than I do on some issues … because she does not even know that I am a homosexual. So, for her it would be very complicated. (25 years old, single, black, HIV-negative).

Fear of being perceived as HIV-positive—Several participants' conveyed concern that others might confuse PrEP with antiretroviral therapy (ART) and assume they were HIV-positive. One participant commented:

> Prejudice still very much exists about people with AIDS. People are going to associate the cocktail, as we call PrEP here, with people that have AIDS, not people that want to protect themselves! So, I would not be afraid of taking PrEP, but of the discrimination that might follow. (22 years old, black, single, HIV-negative status).

Several participants reflected on the current unstable political climate in Brazil and its impact on stigma associated with being gay:

> Conservative politicians, linked to evangelical churches and their political parties, are attempting to make HIV a vile disease. In Brazil, there is an attempt to demonize HIV and to associate with it a behavior of immorality, a sinful disease, a fatal disease. Conservative politicians are promoting policies to make HIV a "disease of fags." (40 years old, black, single, did not take the HIV test).

Fear of being perceived as sexually promiscuous—Others expressed concern that they may not only be identified as having a health problem, but as engaging in promiscuous sexual behaviour:

> I think that if I used it and talked openly about it, especially given I'm gay, people would probably say that 'he probably has some problem because he is taking that.' Or 'If he takes that, he probably doesn't use a condom with anyone, and likely goes out hooking up with everyone.' (28 years old, white, single, HIV-negative).

Facilitators of PrEP Use

Internet and mobile applications as a source of PrEP education—The public services of SUS were not reported as first-choice sites of MSM to look for information about PrEP. The internet and television were cited as more effective in the dissemination of information about PrEP. Some participants with prior knowledge about PrEP indicated they

received information about PrEP on websites and hookup apps. Internet and mobile phone apps were often described as preferred sources of PrEP information:

> I know that there is the Health Centre, but I would not go there in order to look for information. I would do research on the internet because arriving and getting information through SUS services is so complicated...I would only go if I were desperate. (25 years old, pardo – brown skin color –, single, HIV-negative).

Reduced fear associated with having sex—Participants interested in taking PrEP frequently reported that the primary reasons for their enthusiasm about PrEP was protecting their health and being able to relax during sex. One participant summarized these common sentiments:

> I think that it would be a way of taking care of my body. And having taken care of your own body, you can prevent STIs and live more "at ease." Many times, we have sexual relations, and we don't know the person, or whether the person has some STI (23 years old, indigenous, single, HIV-negative).

Risk Compensation and Cultural Beliefs about Condom Use

Cultural issues, Condom Use and Risk Compensation—Participants frequently expressed interest in combining PrEP with other HIV prevention options. Most interviewees noted that they would continue to use condoms, even if they were to take PrEP:

> Yes, fear would decrease. But it would not stop me from using condoms. And then eventually if, by chance, because sometimes our desire gets the best of us, you are having sex without a condom...Then you would be more certain that you would not acquire it [HIV] in cases like that. But even so, I think that the use of the two would be the ideal. Both condoms and PrEP … Other STIs exist that are acquired by not using condoms. (25 years old, single, indigenous, HIV-negative status).

A few participants noted they would prefer to use condoms over PrEP, believing that condoms were more effective than PrEP. One participant remarked:

> I think that for the time being, condom is safer. Because you suffer from fewer side effects. I also think that a condom is a thing that already is in my culture. If I had to have sex with another person I would certainly use a condom, and I would never think about using PrEP. Culturally, I think that the condom is more acceptable, and I would feel safer using a condom itself. I think that PrEP and taking medications to prevent HIV is big fabrication of the pharmaceutical industry. I think that the possibility of a cure, and an interest in reaching that cure, is just a big marketing initiative. (40 years old, black, single, no HIV test).

Discussion

This is among the first studies to explore knowledge about and willingness to use PrEP among MSM in Brazil. Knowledge about PrEP was relatively low among this population of MSM in Northeastern Brazil, and participants cited clinical, social and structural barriers to accessing PrEP in Brazil's public health centers. However, many participants expressed

interest in learning more about and using PrEP. Facilitators of PrEP use willingness included technological factors such as internet and app-based educational resources, as well as reduced fear associated with sex. These findings are timely considering Brazil's recent expansion of PrEP access through SUS.

Knowledge about PrEP among MSM in our study was higher than in a recent meta-analysis carried out in low and middle income countries (29.7%) (Yi et al., 2017). However, knowledge among MSM in our study was lower than among MSM in the *PrEPBrasil* demonstration study (61.3%) (Hoagland, De Boni, et al., 2017) and another recent study conducted in the more developed region of Southern Brazil (57.9%) (Beyrer, et al., 2012; Grinsztejn, et al., 2018). Knowledge about PrEP was also lower than developed countries such as the USA (Eaton et al., 2017) and Portugal (Rocha et al., 2014). Moreover, only 44% of participants in this Northeastern Brazilian city affirmed that they would be willing to use PrEP; this compares to 82.1% found in the *PrEPBrasil* demonstration study (Grinsztejn, et al., 2018; Hoagland, De Boni, et al., 2017). Relatively low rates of acceptability and knowledge about PrEP in a city with high rates of HIV infection among MSM in Brazil is noteworthy. These findings also a contrast with results from PrEP acceptability studies conducted in Southern Brazil, highlighting important geographic variability and wide disparities in PrEP knowledge and acceptability in Brazil (Grinsztejn, et al., 2018; Hoagland, De Boni, et al., 2017). Moreover, our findings highlight how knowledge about PrEP in "real-world" settings in less developed geographic areas of Brazil may differ from knowledge and outcomes associated with clinical trials conducted in more developed Southeastern Brazil. Results from clinical trials nevertheless underscore the viability of PrEP programs in public clinics in resource-limited settings. However, these comparisons must be taken with caution in light of their different methods, samples, and designs. Nevertheless, taken together, the findings from our study and other Brazilian PrEP studies suggest that PrEP expansion in Brazil is viable. For this expansion to succeed, these results also suggest that additional efforts are needed to raise awareness and destigmatize PrEP, particularly outside of Southern Brazil. This might be best achieved by working with the gay activist communities who are working to destigmatize PrEP and to promote more widespread access to PrEP in Brazil's public clinics.

New frameworks defining the PrEP continuum outline discreet public health benchmarks for measuring PrEP awareness, uptake, adherence, and retention in PrEP care (Nunn et al., 2017). These frameworks underscore the importance of upstream interventions to promote PrEP awareness and uptake in order to enhance desirable downstream outcomes that reduce HIV transmission, including retention in PrEP care and adherence to PrEP medication regimens (Nunn, et al., 2017). Brazil has a long track record in successfully implementing HIV prevention and treatment interventions through SUS (Berkman, et al., 2005; Nunn, 2009; Nunn, et al., 2007; Nunn et al., 2009). Brazil recently adopted PrEP guidelines and began offering PrEP in select clinics nationwide, including in Salvador (Ministério da Saúde no Brasil, 2017b, 2018). Brazil is the first country in Latin America, and among the first middle-income countries in the world, to adopt and promote PrEP use in its public clinics. However, our results highlight limited PrEP awareness and several barriers to PrEP uptake. The Brazilian Department of Surveillance, Prevention and Control of Sexually Transmitted Infections, HIV/AIDS and Viral Hepatitis promotes the training of health professionals from

HIV/AIDS care and prevention reference centers, supports state and municipal health management, and develops PrEP outreach materials and protocols. However, the size and complexity of Brazil poses a unique and sizable challenge to implementing these activities across the country due to differences in sociocultural and economic demographics. Therefore, these findings suggest that as Brazil expands access to PrEP in its public clinics, an initial focus may need to be on enhancing PrEP knowledge and willingness in order to have downstream effects on the PrEP continuum regarding uptake, adherence, and retention.

Knowledge about PrEP is one factor associated with increased willingness to take PrEP in other middle- and low-income countries (Yi, et al., 2017). Our results corroborate findings that educational sessions alone about PrEP do not always substantially encourage PrEP uptake (Chan, Glynn, et al., 2016). Educational strategies to raise awareness may need to be more targeted to address specific barriers contributing to low levels of PrEP acceptability, such as doubts about efficacy, side effects, perceived risk, and access to PrEP care services.

Brazil has a long history of activism related to HIV treatment access (Berkman, et al., 2005; Nunn, 2009; Nunn, et al., 2007). Public awareness about the original HIV epidemic in Brazil helped propel the activist movement to destigmatize HIV and normalize HIV treatment. This culminated in public policy to promote HIV treatment in the 1990s and 2000s in Brazil, and Brazil's policies had ripple effects around the globe (Berkman, et al., 2005; Nunn, Fonseca, & Gruskin, 2009; Nunn, et al., 2009). However, HIV-related activism has declined in Brazil in recent years, in part because of limited government support for NGOs that previously received financial aid from the National AIDS Program of Brazil. Moreover, Brazil's recent political and economic tightening of austerity measures greatly impacts funding for health services, which may ultimately slow PrEP rollout and subsequent PrEP uptake (Doniec, Dall'Alba, & King, 2016, 2018). The growing wave of religious conservatism in Brazilian society and in Congress has blocked further progress in the provision of preventive education at schools; this may also undermine implementation and scale of PrEP programs (Malta and Beyrer, 2013). Additionally, the recent election of Jair Bolsonaro (October of 2018), the rightwing extremist, as the new President of Brazil (Londoño and Darlington, 2018a, 2018b), represents a threat to public policies in the field of HIV/AIDS and human rights approach to health. In a statement in a parliamentary interview in 2010, the congressman said that "you should use a condom if you want to use it and if you get it, it's your problem" because "people get sick because they live 'worldly lives' and then want to use public money" (Bolsonaro, 2010). His election represents the advance of racist, homophobic, and misogynistic ideas in Brazilian society in the late 2010s (Brum, 2018).

Given many of the participants' concerns were related to stigma associated with being gay or being perceived as promiscuous, there may be an important role for the gay activist community to help raise awareness, promote PrEP education, and help expand access to PrEP in Brazil's public clinics. The stigma related to HIV/AIDS seems to directly impact that possibility of acquisition, storage and use of PrEP. This was mainly due to the fear of association with being gay or contracting HIV (Van Der Elst et al, 2013). These phenomena can be termed a courtesy stigma that is a stigma "by association" (Pescosolido and Martin, 2015). Stigma with PrEP is commonplace in many settings but has decreased over time in

many settings in which it became more commonly used and also as a result of social marketing campaigns.

Many participants noted that concerns about PrEP's efficacy undermined their willingness to use PrEP; this is a common finding in other countries as well (Golub, Gamarel, Rendina, Surace, & Lelutiu-Weinberger, 2013; Koechlin et al., 2017; Young, Flowers, & McDaid, 2014). Understanding of PrEP's efficacy has been associated with PrEP's acceptability and uptake elsewhere (Peng et al., 2017). As Brazil expands PrEP services in its public clinics, educational messages that incorporate personal testimony from PrEP users, and from gay men and transgender women in particular, may be an important technique to relay information about PrEP efficacy and to motivate users' PrEP uptake and adherence (Brooks et al., 2011).

Multiple studies cite concern about side effects as a reason for unwillingness to use PrEP among MSM (Brooks, et al., 2011; Liu et al., 2014; Yi, et al., 2017). However, some participants described interest in trying PrEP, which is promising given that side effects often diminish after initial weeks of PrEP use (Van der Elst et al., 2013). Exercises of decisional balance commonly used in motivational interviewing might help guide PrEP candidates through the consideration of PrEP (Apodaca and Longabaugh, 2009; Prochaska et al., 1994) and may be useful in promoting PrEP uptake. Additionally, elevating the voices of activists around access to PrEP in Brazil may help normalize PrEP use, debunk myths about side effects, and could help overcome stigma associated with PrEP use.

Low perceived HIV acquisition risk among participants was also a clinical barrier to PrEP uptake. In this study, as in others (Eaton, et al., 2017), participants distanced themselves from population groups they believed to be at higher risk for HIV acquisition. The *PrEPBrasil* demonstration study and studies in the U.S. have found that many individuals who are clinically indicated for PrEP, but who decline PrEP, also have low self-perceived HIV risk (Chan, Glynn, et al., 2016; Hoagland, Moreira, et al., 2017; Liu, et al., 2014). Some participants in our study who reported having stable partners were also less inclined to use PrEP than those who did not, a trend reflected in other studies (Eaton, et al., 2017). Low self-perceived HIV risk in this population underscores the need for interventions and social marketing campaigns to raise HIV risk awareness to help enhance PrEP uptake.

Perhaps most importantly, participants also cited important structural factors as deterrents to PrEP uptake. MSM in Brazil face structural obstacles, including substandard HIV care, long wait times, and urban mobility costs in Brazil (Hoffmann et al., 2015); these challenges are also common in high-income countries (Millett et al., 2012). Nearly all participants cited concerns about lack of culturally competent care for MSM in publicly funded health centers at the time of the study, as well as concerns about disclosing their sexual orientation to their providers. Taken together, these findings underscore the need to train health care providers in providing culturally competent care to enhance PrEP uptake in public health centres in Brazil. There is also a need to create supportive environments for MSM who may present for PrEP, or for MSM who present for other services who could conceivably be linked to PrEP services. The cost of PrEP has presented challenges for scaling up PrEP in the US (Brooks, et al., 2011; Yi, et al., 2017); however, this was not a problem reported by participants in our

study, likely because the Brazilian public health system has historically provided reliable access to HIV medicines free of cost to patients (Nunn, et al., 2007).

Since many participants reported learning about PrEP online, there may be public health opportunities associated with digital social marketing campaigns to raise PrEP awareness and promote PrEP uptake. A recent study in Thailand found that an online HIV education and counselling website successfully connected many MSM and TGW to PrEP resources and care and contributed to an increase in PrEP uptake (Anand et al., 2017).

Our study is subject to several limitations. We collected data before PrEP was available in Brazil's publicly funded health clinics and now awareness can enhance by the implementation of this health policy; attitudes and awareness about PrEP will likely evolve as PrEP services are offered in Salvador and elsewhere in Brazil. While having sex with another man was a requirement for participation, unprotected anal intercourse was not a criterion for participating in our study; our results may therefore not reflect attitudes about the populations at highest risk for HIV acquisition in Brazil. We do not have data to compare the perception between those who previously knew about PrEP and those who did not. Our results do not search for generalizability as this is a qualitative study based on a purposive sample of MSM. Despite these limitations, the results of our study have practical implications for the future implementation of PrEP programs in Brazil and other low and middle-income countries that plan to expand PrEP services.

Conclusion

Our results suggest that as Brazil begins to expand access to PrEP through the public sector, uptake in Northeastern Brazil may be somewhat slow due to limited knowledge and willingness to use PrEP; these findings likely have implications for other parts of Brazil as well. Our findings suggest that enhancing progression through the PrEP continuum in Brazil may first need to start with raising PrEP awareness and knowledge about its efficacy and side effects. PrEP uptake might also be buttressed by efforts to provide important educational information to individuals at high risk for HIV acquisition. Social marketing campaigns, particularly campaigns focused on reaching MSM online, and those that elevate the voices of the gay community, may raise awareness about PrEP and reduce social stigma associated with PrEP. Training PrEP providers in how to provide culturally competent care to MSM may also enhance PrEP uptake in Brazil. These "upstream" efforts to enhance outcomes in the PrEP care continuum will enhance "downstream" outcomes such as retention in PrEP care and ultimately, will promote the expansion of PrEP programs in Brazil.

Brazil has successfully expanded access to medications for HIV treatment over the last 25 years; Brazil's policies paved the way for other developing countries to expand access to HIV treatment, prompting for sea changes in global public health policy. Brazil also has the public health opportunity to lead the way in expanding access to PrEP; recent clinical trials demonstrate that scaling PrEP in Brazil is feasible. Achieving this laudable goal may require reinvigorating the activist community to help raise awareness and promote acceptability of PrEP among young MSM.

Acknowledgments:

The authors would like to express their gratitude to the participants of the study, to the local team that carried out the fieldwork in Salvador- Lucilia Nascimento, Ailton Jesus da Silva, Filipe Matheus Duarte, Fernanda Encarnação, Munyra Araújo and all collaborating NGO- Gay Group of Bahia (GGB) and Grupo de Apoio à Prevenção à Aids da Bahia (GAPA-Bahia). We are also grateful for the support of Brazilian Department of Surveillance, Prevention and Control of Sexually Transmitted Infections, HIV/AIDS and Viral Hepatitis of the Secretariat for Health Surveillance of the Ministry of Health; and the Brazil Community Health Fellowships Program as part of Brown University's Brazil Initiative.

Funding: Financial support for this study was provided by Brazilian Ministry of Health, through its Secretariat for Health Surveillance and its Department of Prevention, Surveillance and Control of Sexually Transmitted Infections, HIV/AIDS and Viral Hepatitis through grant number LN7901-BR. Additional funding was provided by the National Institute of Mental Health through grant numbers R25MH083620 and T37MD008655. This study received financial support from the Brown University Brazil Initiative. No funding bodies had any role in study design, data collection and analysis, decision to publish, or preparation of the manuscript.

List of abbreviations

AIDS	Acquired Immune Deficiency Syndrome
DSAVH/MoH	Department of STI/AIDS and Viral Hepatitis/Ministry of Health
HIV	Human Immunodeficiency Virus
MSM	Men who have sex with men
PrEP	Pre-exposure prophylaxis
STI	Sexually transmitted infections
SUS	Brazilian National Health System
TGW	Transgender women

References

Anand T, Nitpolprasert C, Trachunthong D, Kerr SJ, Janyam S, Linjongrat D, … Phanuphak N (2017). A novel Online-to-Offline (O2O) model for pre-exposure prophylaxis and HIV testing scale up. J Intl AIDS Soc, 20(1), p 21326.

Apodaca TR, & Longabaugh R (2009). Mechanisms of change in Motivational Interviewing: A review and preliminary evaluation of the evidence. Addiction, 104(5), pp. 705–715. [PubMed: 19413785]

Attride-Stirling J (2001). Thematic networks: an analytic tool for qualitative research. Qualitative Research, 1(2), pp. 385–405.

Baeten J, Donnell D, Ndase P, Mugo N, Campbell J, Wangisi J, … Celum C (2012). Antiretroviral prophylaxsis for HIV prevention in heterosexual men and women. N Eng J Med, 367(5), pp. 399–410.

Baeten JM, Heffron R, Kidoguchi L, Mugo NR, Katabira E, Bukusi EA, … Celum C (2016). Integrated Delivery of Antiretroviral Treatment and Pre-exposure Prophylaxis to HIV-1–Serodiscordant Couples: A Prospective Implementation Study in Kenya and Uganda. PLoS Med, 13(8), p e1002099. [PubMed: 27552090]

Berkman A, Garcia J, Munoz-Laboy M, Paiva V, & Parker R (2005). A Critical Analysis of the Brazilian Response to HIV/AIDS: Lessons Learned for Controlling and Mitigating the Epidemic in Developing Countries. American Journal of Public Health, 95(7), pp. 1162–1172. [PubMed: 15933232]

Beyrer C, Baral SD, Griensven F, Goodreau SM, Chariyalertsak S, Wirtz AL, & Brookmeyer R (2012). Global epidemiology of HIV infection in men who have sex with men. Lancet, 380(9839), pp. 367–377. [PubMed: 22819660]

Bolsonaro C (Producer). (2010). Bolsonaro no CQC (Pegar Aids Por Vadiagem Não é Problema do Estado). [Interview] Retrieved from https://www.youtube.com/watch?v=eLoypRiD35E

Brooks R, Kaplan R, Lieber E, Landovitz R, Lee S, & Leibowitz A (2011). Motivators, concerns, and barriers to adoption of preexposure prophylaxis for HIV prevention among gay and bisexual men in HIV-serodiscordant male relationships. AIDS Care, 23(9), pp. 1136–1145. [PubMed: 21476147]

Brum E (2018, 10 6). How a homophobic, misogynist, racist 'thing' could be Brazil's next president. The Guardian. Retrieved from https://www.theguardian.com/commentisfree/2018/oct/06/homophobic-mismogynist-racist-brazil-jair-bolsonaro

Cáceres C, Bekker L, & Godfrey-Faussett P (2016). No one left behind: how are we doing in the roll-out of PrEP as part of combination HIV prevention? J Int AIDS Soc, 19(Suppl 6), p 21364. [PubMed: 27760690]

Cáceres C, Borquez A, Klausner J, Baggaley R, & Beyrer C (2016). Implementation of pre-exposure prophylaxis for human immunodeficiency virus infection: progress and emerging issues in research and policy. J Intl AIDS Soc, 19(Suppl 6), p 21108.

Chan P, Glynn TR, Oldenburg CE, Montgomery MC, Robinette AE, Almonte A, …, Nunn AS (2016). Implementation of Preexposure Prophylaxis for Human Immunodeficiency Virus Prevention Among Men Who Have Sex With Men at a New England Sexually Transmitted Diseases Clinic. Sex Transm Dis, 43(11), pp. 717–723. [PubMed: 27893604]

Chan P, Mena L, Patel R, Oldenburg C, Beauchamps L, Perez-Brumer A, …, Nunn A (2016). Retention in care outcomes for HIV pre-exposure prophylaxis implementation programmes among men who have sex with men in three US cities. J Intl AIDS Soc, 19(1), p 20903.

Cohen S, Vittinghoff E, Bacon O, Doblecki-Lewis S, Postle B, Feaster D, …, Liu A (2015). High interest in preexposure prophylaxis among men who have sex with men at risk for HIV infection: baseline data from the US PrEP demonstration project. J Acquir Immune Defic Syndr, 68(4), pp. 439–448. [PubMed: 25501614]

Collucci C (2017). Governo adota no SUS pílula que previne HIV em grupos de risco. Retrieved from https://www1.folha.uol.com.br/equilibrioesaude/2017/05/1887148-governo-adota-no-sus-pilula-que-previne-hiv-em-grupos-de-risco.shtml

Doniec K, Dall'Alba R, & King L (2016). Austerity threatens universal health coverage in Brazil. Lancet, 388(10047), pp. 867–868. doi:10.1016/s0140-6736(16)31428-3 [PubMed: 27597461]

Doniec K, Dall'Alba R, & King L (2018). Brazil's health catastrophe in the making. Lancet, 392(10149), pp. 731–732. doi:10.1016/s0140-6736(18)30853-5 [PubMed: 30037732]

Eaton L, Kalichman S, Price D, Finneran S, Allen A, & Maksut J (2017). Stigma and Conspiracy Beliefs Related to Pre-exposure Prophylaxis (PrEP) and Interest in Using PrEP Among Black and White Men and Transgender Women Who Have Sex with Men. AIDS Behav, 21(5), pp. 1236–1246. [PubMed: 28108878]

Glaser B, & Strauss A (1967). The discovery of grounded theory: Strategies for qualitative research Chicago: Aldine.

Golub S, Gamarel K, Rendina H, Surace A, & Lelutiu-Weinberger C (2013). From efficacy to effectiveness: facilitators and barriers to PrEP acceptability and motivations for adherence among MSM and transgender women in New York City. AIDS Patient Care and STDs, 27(4), pp. 248–254. [PubMed: 23565928]

Grant RM, Lama JR, Anderson PL, McMahan V, Liu AY, Vargas L, …, Glidden DV (2010). Preexposure chemoprophylaxis for HIV prevention in men who have sex with men. N Engl J Med, 363(27), pp. 2587–2599. doi:10.1056/NEJMoa1011205 [PubMed: 21091279]

Grinsztejn B, Hoagland B, Moreira RI, Kallas EG, Madruga JV, Goulart S, …, Veloso VG (2018). Retention, engagement, and adherence to pre-exposure prophylaxis for men who have sex with men and transgender women in PrEP Brasil: 48 week results of a demonstration study. Lancet HIV, 5(3), pp. 136–145.

Guimaraes MDC, Kendall C, Magno L, Rocha GM, Knauth DR, Leal AF, …, Kerr L (2018). Comparing HIV risk-related behaviors between 2 RDS national samples of MSM in Brazil, 2009

and 2016. Medicine (Baltimore), 97(1S Suppl 1), pp. S62–s68. doi:10.1097/md.0000000000009079 [PubMed: 29912816]

Haberer JE, Kidoguchi L, Heffron R, Mugo N, Bukusi E, Katabira E, …, Baeten JM (2017). Alignment of adherence and risk for HIV acquisition in a demonstration project of pre-exposure prophylaxis among HIV serodiscordant couples in Kenya and Uganda: a prospective analysis of prevention-effective adherence. J Intl AIDS Soc, 20(1), p 21842.

Hoagland B, De Boni R, Moreira R, Madruga J, Kallas E, Goulart S, … ., Veloso VG (2017). Awareness and Willingness to Use Pre-exposure Prophylaxis (PrEP) Among Men Who Have Sex with Men and Transgender Women in Brazil. AIDS Behav, 21(5), pp. 1278–1287. [PubMed: 27531461]

Hoagland B, Moreira R, De Boni R, Kallas E, Madruga J, Vasconcelos R, …, Grinsztejn B (2017). High pre-exposure prophylaxis uptake and early adherence among men who have sex with men and transgender women at risk for HIV Infection: the PrEP Brasil demonstration project. J Int AIDS Soc, 20(1), pp. 1–14.

Hoffmann M, MacCarthy S, Batson A, Crawford-Roberts A, Rasanathan J, Nunn A, …, Dourado I (2015). Barriers along the care cascade of HIV-infected men in a large urban center of Brazil. AIDS Care, 28(1), pp. 57–62. [PubMed: 26291264]

Instituto Brasiliero de Geografica e Estatistica. (2016). Cidades: Salvador. Retrieved from https://cidades.ibge.gov.br/xtras/perfil.php?codmun=292740.

Jansen MPM (2015). PrEP: why are we waiting? The Lancet HIV, 2(10), p e401. [PubMed: 26423641]

Kerr L, Kendall C, Guimarães MDC, Mota RMS, Veras MA, Dourado I, …, Johnston LG (2018). HIV prevalence among men who have sex with men in Brazil: results of the 2nd national survey using respondent-driven sampling. Medicine, 97(1S Suppl 1), S9–S15. [PubMed: 29794604]

Kerr LR, Mota RS, Kendall C, Pinho A. d. A., Mello MB, Guimarães MDC, …, Rutherford G (2013). HIV among MSM in a large middle-income country. AIDS, 27(3), pp. 427–435. [PubMed: 23291540]

Koechlin F, Fonner V, Dalglish S, O'Reilly K, Baggaley R, Grant R, …, Kennedy C (2017). Values and Preferences on the Use of Oral Pre-exposure Prophylaxis (PrEP) for HIV Prevention Among Multiple Populations: A Systematic Review of the Literature. AIDS Behav, 21(5), pp. 1325–1335. [PubMed: 27900502]

Koester KA, & Grant RM (2015). Keeping our eyes on the prize: no new HIV infections with increased use of HIV pre-exposure prophylaxsis. Clin Infect Dis., 61(10), pp. 1604–1605. [PubMed: 26334051]

Levine K, Maloney KM, Zaslow S, Krakower DS, Grasso C, John BH, …, Boswell SH (2016) Increasing HIV suppression, PrEP use, and STDs in Boston MSM accessing primary care (abstract ID 890). Paper presented at the 2016 Conference on Retroviruses and Opportunistic Infections (CROI), Boston, MA.

Liu A, Cohen S, Follansbee S, Cohan D, Weber S, Sachdev D, & Buchbinder S (2014). Early Experiences Implementing Pre-exposure Prophylaxis (PrEP) for HIV Prevention in San Francisco. PLoS Med, 11(3), p e1001613. [PubMed: 24595035]

Londoño E, & Darlington S (2018a, 10 5, 2018). Far-Right Candidate Jair Bolsonaro Widens Lead in Brazil's Presidential Race. The New York Times. Retrieved from https://www.nytimes.com/2018/10/05/world/americas/brazil-presidential-race-bolsonaro.html

Londoño E, & Darlington S (2018b, 10 28, 2018). Jair Bolsonaro Wins Brazil's Presidency, in a Shift to the Far Right. The New York Times. Retrieved from https://www.nytimes.com/2018/10/28/world/americas/jair-bolsonaro-brazil-election.html

Malta M, & Beyrer C (2013). The HIV epidemic and human rights violations in Brazil. J Int AIDS Soc, 16, p 18817. doi:10.7448/ias.16.1.18817 [PubMed: 24225350]

Marcus J, Volk J, Pinder J, Liu A, Bacon O, Hare C, & Cohen S (2016). Successful Implementation of HIV Preexposure Prophylaxis: Lessons Learned From Three Clinical Settings. Springer, 13(2), pp. 116–124.

Millett G, Peterson J, Flores S, Hart T, Jeffries W. t., Wilson P, …, Remis R (2012). Comparisons of disparities and risks of HIV infection in black and other men who have sex with men in Canada, UK, and USA: a meta-analysis. Lancet, 380(9839), pp. 341–348. [PubMed: 22819656]

Ministério da Saúde no Brasil. (2017a). Boletim Epidemiológico HIV Aids 2017. Retrieved from http://www.aids.gov.br/pt-br/pub/2017/boletim-epidemiologico-hivaids-2017

Ministério da Saúde no Brasil. (2017b). Protocolo Clínico e Diretrizes Terapêuticas para Profilaxia Pré-Exposição (PrEP) de Risco à Infecção pelo HIV. http://www.aids.gov.br/es/node/64510

Ministério da Saúde no Brasil. (2017c). SUS amplia oferta do tratamento para aids com medicamento inovador para pacientes com HIV e Aids. Retrieved from http://www.brasil.gov.br/saude/2017/09/sus-amplia-oferta-de-medicamento-inovador-para-pacientes-com-hiv-e-aids.

Ministério da Saúde no Brasil. (2018). Serviços de Saúde - PrEP. Retrieved from http://www.aids.gov.br/pt-br/acesso_a_informacao/servicos-de-saude/prep.

Montgomery M, Oldenburg C, Nunn A, Mena L, Anderson P, Liegler T, …, Chan P (2016). Adherence to Pre-Exposure Prophylaxis for HIV Prevention in a Clinical Setting. PLoS One, 11(6), p e0157742. [PubMed: 27333000]

Nunn A (2009). The Politics and History of AIDS Treatment in Brazil New York: Springer International.

Nunn A, Brinkley-Rubinstein L, Oldenburg C, Mayer K, Mimiaga M, Patel R, & Chan P (2017). Defining the HIV pre-exposure prophylaxis care continuum. AIDS, 31(5), pp. 731–734. [PubMed: 28060019]

Nunn A, Fonseca E, Bastos F, Gruskin S, & Salomon J (2007). Evolution of antiretroviral drug costs in Brazil in the context of free and universal access to AIDS treatment. PLoS Med, 4(11), p e305. [PubMed: 18001145]

Nunn A, Fonseca ED, & Gruskin S (2009). Changing global essential medicines norms to improve access to AIDS treatment: lessons from Brazil. Glob Public Health, 4(2), pp. 131–149. [PubMed: 19333805]

Nunn AS, da Fonseca EM, Bastos FI, & Gruskin S (2009). AIDS treatment in Brazil: impacts and challenges. Health Affairs (Millwood), 28(4), pp. 1103–1113. doi:28/4/1103 [pii] 10.1377/hlthaff.28.4.1103

Observatório Nacional de Políticas de AIDS. (2016). Myth vs. Reality: Evaluating the Brazilian Response to HIV in 2016. From http://gapwatch.org/wp-content/uploads/2016/07/Myth-vs-Reality_BRAZIL-HIV_2006.pdf.

Parker S, Chan P, Oldenburg C, Hoffmann M, Poceta J, Harvey J, …, Nunn A (2015). Patient Experiences of Men Who Have Sex with Men Using Pre-Exposure Prophylaxis to Prevent HIV Infection. AIDS Patient Care STDS, 29(12), pp. 639–642. [PubMed: 26669791]

Peng P, Su S, Fairley C, Chu M, Jiang S, Zhuang X, & Zhang L (2017). A Global Estimate of the Acceptability of Pre-exposure Prophylaxis for HIV Among Men Who have Sex with Men: A Systematic Review and Meta-analysis. AIDS Behav, 22(4), pp. 1–12.

Prochaska J, Velicer W, Rossi J, Goldstein M, Marcus B, Rakowski W, …, Rosenbloom D (1994). Stages of change and decisional balance for 12 problem behaviors. Health Psychol, 13(1), pp. 39–46. [PubMed: 8168470]

Rocha L, Campos M, Brito J, Fuertes R, Rojas J, Pinto N, …, Esteves J (2014). Acceptability of PrEP among HIV negative Portuguese men who have sex with men that attended 2014 Lisbon pride fair. J Int AIDS Soc, 17(Suppl 3), p 19734. [PubMed: 25397480]

Ryan GW, & Bernard HR (2000). Data management and analysis methods In Denzin NK & Lincoln YS (Eds.), Handbook of Qualitative Research (2 ed., pp. 769–802). Thousand Oaks, CA: Sage Publications, Inc.

Siegler A, Mouhanna F, RM G, Weiss K, Pembleton E, …, Sullivan PS (2018). The prevalence of PrEP use and the PrEP-to-need ratio in the fourth quarter of 2017, United States. Annals of epidemiology. Advance online publication. Retrieved from 10.1016/j.annepidem.2018.06.005

Steffner F, & Parker R (2016). A neoliberalização da prevenção do HIV e a resposta brasileira à AIDS In Corrêa S (Ed.), Mito vs Realidade: sobre a respostabrasileira à epidemia de HIV e AIDS em 2016 (pp. 24–32). Rio de Janeiro: Associação Brasileira Interdisciplinar de AIDS.

Teixeira P, Vitoria MA, & Barcarolo J (2004). Antiretroviral Treatment in Resource-poor Settings: the Brazilian Experience. AIDS, 18(Supp 3), pp. S5–7. [PubMed: 15322477]

Thigpen M, Kebaabetswe P, Paxton L, Smith D, Rose C, TM S, …, Brooks JT (2012). Antiretroviral Preexposure Prophylaxsis for Heterosexual HIV Transmission in Botswanna. N Engl J Med,

367(5), pp. 423–434. Retrieved from http://www.nejm.org/doi/full/10.1056/NEJMoa1110711#t=article [PubMed: 22784038]

United Nations Programme on HIV/AIDS. (2016a). HIV and AIDS estimates (2016). Retrieved from http://www.unaids.org/en/regionscountries/countries/brazil.

United Nations Programme on HIV/AIDS. (2016b). Prevention Gap Report. Geneva, Switzerland: http://www.unaids.org/sites/default/files/media_asset/global-AIDS-update-2016_en.pdf

Van Damme L, Corneli A, Ahmed K, Agot K, Lombaard J, Kapiga S, … ., Taylor D (2012). Preexposure prophylaxis for HIV infection among African women. N Engl J Med, 367(5), pp. 411–422. [PubMed: 22784040]

Van der Elst E, Mbogua J, Operario D, Mutua G, Kuo C, Mugo P, …, Sanders E (2013). High acceptability of HIV pre-exposure prophylaxis but challenges in adherence and use: qualitative insights from a phase I trial of intermittent and daily PrEP in at-risk populations in Kenya. AIDS Behav, 17(6), pp. 2162–2172. [PubMed: 23080358]

World Health Organization. (2015). Policy Brief: WHO expands recommendation on oral pre-exposure prophylaxsis of HIV infection (PrEP). Retrieved from http://apps.who.int/iris/bitstream/10665/197906/1/WHO_HIV_2015.48_eng.pdf?ua=1.

Yi S, Tuot S, Mwai G, Ngin C, Chhim K, Pal K, …, Mburu G (2017). Awareness and willingness to use HIV pre-exposure prophylaxis among men who have sex with men in low- and middle-income countries: a systematic review and meta-analysis. J Int AIDS Soc, 20(1), p 21580. [PubMed: 28691439]

Young I, Flowers P, & McDaid LM (2014). Barriers to uptake and use of pre-exposure prophylaxis (PrEP) among communities most affected by HIV in the UK: findings from a qualitative study in Scotland. BMJ Open, 4(11), p e005717.

Young I, & McDaid L (2014). How acceptable are antiretrovirals for the prevention of sexually transmitted HIV?: A review of research on the acceptability of oral pre-exposure prophylaxis and treatment as prevention. AIDS Behav, 18(2), pp. 195–216. [PubMed: 23897125]

Table 1.

Socio-demographic characteristics of MSM, Salvador-Bahia, Brazil.

Variables	Number	Percentage
Age (mean)	26	
Salary (mean)	$285 USD (R$948)	
Race		
White	5	15.6
Black	25	78.1
Indigenous	2	6.3
Marital status		
Single	27	84.3
Married	2	6.3
Unmarried but in relationship with a man	2	6.3
Unmarried but in relationship with a woman	1	3.1
Employment		
Employed full time	2	6.3
Temporarily employed/short term work	1	3.1
Independently employed	5	15.6
Unemployed	7	21.9
Informal sector	17	53.1
History of STI		
Yes	6	18.8
No	26	81.2
History of an HIV test		
Yes	25	78.1
No	7	21.9
HIV test results in surveillance survey		
Positive	3	9.4
Negative	29	90.6
Knowledge about PrEP before the study		
Yes	10	31.3
No	22	68.8
Willingness to use PrEP		
Yes	15	46.9
No	17	53.1
Would stop using condoms if using PrEP		
Yes	7	21.9
No	25	78.1