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Barriers and facilitators to scaling up access to HIV pre-exposure prophylaxis among key populations: A qualitative study of the incentive-based PrEP Seguro program in Mexico

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Abstract

Introduction: Daily oral pre-exposure prophylaxis (PrEP) is highly safe and effective for HIV prevention, yet barriers to PrEP access and adherence persist among key populations. In Mexico, incentive-based pilot programs have been effective in improving PrEP adherence among male sex workers. Understanding the experiences of providers and program implementers is critical to integrating PrEP adherence programs as part of standard care in Mexico and similar settings.

Methods: We conducted 17 in-depth informational interviews with care providers and staff responsible for administering PrEP to key populations (men who have sex with men, male sex workers, transgender women) in Mexico City. Interviews explored successes and challenges surrounding current PrEP implementation, as well as adaptations that could facilitate national scale-up of PrEP programs in Mexico. Informant transcripts were analyzed using a hybrid inductive-deductive thematic analysis approach utilizing CFIR constructs for the initial codebook while allowing for inductive findings.

Results: Three key themes emerged from informant interviews as important for promoting PrEP programs in Mexico: 1) increasing individual PrEP access, 2) strengthening quality of care, and 3) improving organizational and structural support.

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Declaration of competing interest

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Conclusions: PrEP in Mexico is currently only available in a few clinics with high patient populations, and siloed HIV services, stigma, and a lack of inter-organizational collaboration remain persistent barriers to PrEP uptake. Promoting government collaboration and increasing financial support for community-based organizations is needed to expand PrEP access. Tailored, destigmatizing information about PrEP services needs to be diffused among both staff and patients to strengthen care quality.

Keywords

HIV prevention; PrEP; Sex workers; Men who have sex with men; LMIC; Key populations

1. Introduction

The use of antiretroviral therapy to prevent new HIV infections among HIV-negative individuals in key populations is safe and highly effective with sufficient adherence (Anderson et al., 2012; Bavinton et al., 2021; Salinas-Rodríguez et al., 2022). However, significant barriers to accessing and adhering to pre-exposure prophylaxis (PrEP) persist, especially among some of the most susceptible populations in low- and middle-income countries (LMICs) (Galárraga et al., 2014). HIV is widespread among key populations in Mexico with incident rates among male sex workers (MSWs) of 5.23 per 100 person-years (Ganley et al., 2021). MSWs in Mexico City are 126 times more likely to be living with HIV than the general adult population (Edeza et al., 2020), yet only 10 percent of known HIV-negative MSWs in Mexico City are currently accessing PrEP for HIV prevention (Kadiamada-Ibarra et al., 2021). This disparity between new HIV cases and enrollments in preventative treatment highlights the urgent need to promote PrEP uptake among key populations in Mexico.

Low utilization of PrEP among MSWs is due largely to limited PrEP knowledge, HIV-related stigma when seeking care, and structural and socioeconomic barriers (Kadiamada-Ibarra et al., 2021). The ImPrEP México demonstration project, launched in 2018, is the largest PrEP implementation study in Latin America to this day and the first to provide free, same-day PrEP to men who have sex with other men (MSM) and transgender women (TGW) in Mexico City, Guadalajara, and Puerto Vallarta (Veloso et al., 2023). While ImPrEP México has shown good levels of early PrEP continuation among intervention participants within 120 days following initiation (Veloso et al., 2019), there is a paucity of evidence surrounding the medium-to longer-term impacts of PrEP adherence programs on HIV outcomes among Mexico's most susceptible populations.

The PrEP Seguro randomized pilot trial (ClinicalTrials.gov Identifier: NCT03674983; NIH/NIMH Award #R34MH114664, PI: Galárraga) was conducted to promote PrEP adherence by testing the extent to which user-centered conditional economic incentives (CEIs) can increase adherence to free PrEP among MSWs in Mexico City. All PrEP Seguro trial study protocols and materials were approved by the Brown University ethics committee (IRB Authorization Agreement #18–70) and Instituto Nacional de Salud Pública (INSP) in Mexico (Protocol P33–18) (Salinas-Rodríguez et al., 2022). The trial procedures consisted of 100 MSWs being randomized to either a standard of care group, which received

information, prescription, and free PrEP, or a CEI group, which received incentives contingent on their adherence to PrEP in addition to the standard of care group benefits. Both groups were assessed for their adherence via scalp hair analysis as well as secondary outcomes including clinic attendance, medication possession ratio, number of partners, condom use, and incident STIs (Galárraga, 2018). The increase in adherence was found to be 26 to 33 percent in the incentive group, indicating a significantly greater increase in adherence among the intervention CEI group than the control group, and the intervention was highly cost-effective (Galárraga et al., 2023). Increasing the future policy relevance of this pilot study depends on timely information on the implementation needs and capacity of care providers in Mexico. Thus, the present research elicits perspectives from key informants related to successes of program implementation and challenges to be addressed prior to scale-up to ensure that this information is readily available to inform future national scale-up of PrEP services in Mexico.

The objective of this research is to understand providers' views of the impact of the PrEP Seguro randomized pilot trial on PrEP adherence among MSWs in Mexico City, the current barriers and facilitators to PrEP access among other key populations, the potential for scaling up PrEP to the national level, and challenges that need to be addressed prior to scale-up.

2. Methods

This study employed a qualitative approach. Research was conducted immediately following the end of the PrEP Seguro study in June 2022. Details of the PrEP Seguro methodology (Galárraga, 2018), as well as major findings from Aim 1 of the study (a discrete choice experiment) (Salinas-Rodríguez et al., 2022), are available elsewhere.

2.1. Qualitative data collection

In-depth informational interviews were conducted with 17 clinical personnel and administrative staff (7 counselors, 4 doctors, and 6 administrators; 12 men and 5 women) from five sites involved in implementing PrEP (Clínica Especializada Condesa (10), Clínica Especializada Condesa Iztapalapa (1), Inspira Cambio (4), CHECCOS (1), and La Unidad Trans (1)). Clínica Especializada Condesa, founded in 2000, and Clínica Especializada Condesa Iztapalapa, founded in 2015 in response to the growing demand for services, are two Mexico City clinics that make up the largest center specializing in HIV in Mexico. The Condesa clinics provide preventative treatment, detection, and comprehensive care for HIV, AIDS, and other sexual and mental health services (Gudiño Solorio, 2021). Key informants were chosen largely through snowball sampling while also incorporating purposive sampling to ensure that perspectives of different roles within PrEP administration were appropriately included. Informants were selected based on their experience with and involvement in PrEP administration and/or the execution of the PrEP Seguro project and informants were recruited until saturation of topics was reached. Interviews were conducted on PrEP administration and not about key informants themselves. Thus, Brown University's Institutional Review Board (IRB) determined this project did not meet criteria for human subjects research and a consent waiver was not required. All identified key informants

were sent a letter that explained the research objectives and rationale and invited them to participate in an interview (Appendix A). Key informants were not compensated and all participation was voluntary. A semi-structured interview guide specific to this study was developed to explore the following themes (Appendix B): impact of incentives in the PrEP Seguro pilot program in terms of recruiting and following MSWs and remaining adherent to PrEP, barriers and facilitators to PrEP access among other key populations, challenges to PrEP implementation, and context (e.g., target implementation sites, type of government support required, supply chain demands) in which PrEP as well as a similar incentives program could be scaled up nationally. The key informants discussed two distinct populations. First, male sex workers (MSWs) who were PrEP Seguro participants with these basic eligibility criteria: male at birth and self-identifies as male at the time of enrollment; at least 18 years of age; has tested negative for HIV in the past month. [See complete eligibility criteria listed in ClinicalTrials.gov] (Galárraga, 2018). Second, key informants referred to transgender women (TGW), meaning males at birth who self-identified as females at the time of using PrEP services at the clinic. The Consolidated Framework for Implementation Research (CFIR) was used to structure the interview guide to ensure that all aspects relevant to implementation of the intervention would be captured (Damschroder et al., 2009).

Interviews were conducted in person at a mutually agreed upon time and location convenient to both the informant and the researcher. Key informants who were not available in person participated in a web-based interview. All interviews were conducted in Spanish and audio recorded. All interviews were conducted by the first author who is a white bilingual cisgender woman originally from the United States with significant experience working with Spanish-speaking low-income populations. The corresponding author has been conducting HIV research in Mexico since 2006 and is fully bilingual. Brown University has been collaborating with Clínica Especializada Condesa since 2010.

2.2. Data analysis

In-depth interviews were transcribed using the audio recordings, checked for accuracy and quality, de-identified, and stored digitally in a secure format as a password-protected, encrypted file. NVivo 20.5.1.940, a qualitative data analysis and research software, was utilized to analyze key factors from the key informant interviews related to challenges and successes of the PrEP Seguro program and future channels for scaling up PrEP in Mexico. A hybrid inductive-deductive approach was followed for analysis of qualitative data such that CFIR was used as a starting point to deductively create the interview guide but allowed for themes to emerge from the data inductively throughout the analysis (Fereday & Muir-Cochrane, 2006). After an initial reading of the transcripts, an a priori codebook was developed using CFIR constructs and with input from the co-author team. The codebook was developed in English; however, the formal coding occurred in Spanish led by the bilingual first author. Data was then coded beginning with “open coding” of the interview data (i.e., summarizing primary broad categories), then “axial coding” (i.e., clustering similar themes together), and finally “selective coding” (i.e., identifying the most common and important core themes) to explain the data comprehensively. During coding, if data emerged that did not fit the codebook codes, emergent codes were added and previously coded transcripts were re-reviewed. All codes were then analyzed using thematic analysis

through iterative comparisons. Initial themes were constructed and presented to the wider research team, resulting in additional queries and data checks to ensure themes accurately represented the data. Quotes with potential for inclusion in the manuscript were translated to English.

3. Results

Key informant interviews were conducted with 17 key stakeholders. The roles/occupations of these informants included counselors, doctors, and administrative staff. Three main themes arose from the data as being important for future PrEP implementation and scale-up: 1) making care more accessible, 2) improving the quality of care, and 3) improving organizational and structural support.

3.1. Making care more accessible

Informants highlighted the need to make PrEP and other related services more accessible. Though they referred to PrEP users as mainly responding positively to PrEP services, many barriers to receiving care persist. Common informant suggestions to reduce these barriers included utilizing incentives to attract more hard-to-reach populations, reframing clinics as not just HIV clinics by promoting their other services, demedicalizing PrEP so that no prescription is required, decentralizing care by expanding to other cities, and collaborating with NGOs.

3.1.1. PrEP Seguro: economic incentives for PrEP adherence among PrEP Seguro trial participants—

Regarding the PrEP Seguro trial, some informants believed that the incentives administered during the trial were somewhat irrelevant in the more highly educated and relatively wealthier (online escort) MSW population of PrEP Seguro trial participants, and that the biggest incentive was simply access to free PrEP to be able to feel protected, or that lubricants, condoms, dental services, and mental health services could serve as an incentive in this population. These informants believed that incentives in MSWs did not influence adherence to PrEP as much as hoped and that the highest concentration values for adherence were not achieved. Other informants claimed that while the economic aspect was still beneficial, it attracted a less diverse population of MSWs than intended by the study. Informants affirmed that incentives would result in larger improvements in adherence in harder-to-reach populations not included as PrEP Seguro trial participants, especially TGW and people experiencing homelessness (Table 1). Otherwise, without incentives, “the population that knows about [PrEP] is little” and tends to include MSM “who [have] higher education than high school” (PID10). Informants stressed that incentives need to be population-specific, so trial studies like PrEP Seguro should be done to determine “the profile of incentive that is the most attractive” (PID 12). There were concerns of PrEP Seguro trial participants adapting to the incentives, so several informants noted the importance of maintaining incentives and educating patients to make them feel in charge of their sexual health.

3.1.2. Beyond the PrEP Seguro trial: PrEP users’ response—

Informants perceived the response to PrEP of individuals seeking PrEP outside of the PrEP Seguro

trial, referred to in the present study as PrEP users, as extremely positive with PrEP users feeling grateful to be included in PrEP as it allowed them "to feel safer or doubly protected" (PID1). Many can "begin to enjoy their sexual life" with one doctor claiming that they "tell you since [they] started taking PrEP [their] life has changed" (PID11). Informants reported that PrEP users almost always had no side effects. They referred to how PrEP users - especially those who previously attended other clinics (e.g., clinics designated for individuals with the government-funded insurance given to employees in the formal sector in Mexico) and described stigmatizing experiences there - praised the flexibility of the clinics at which the interviews were conducted, the personalized, judgment-free treatment they received, the shorter waiting times, and the many other services they were able to receive with PrEP, including detection and treatment of STIs, vaccinations, condoms, and lubricants. The few PrEP user complaints that informants mentioned lay in the frequency of testing either being too frequent or infrequent, care at the Condesa clinics being limited to Mexico City residents, receiving fewer months of PrEP at a time than desired, lacking information on PrEP or the process of taking it, questionnaires being too long, or fatigue from keeping up with a daily pill.

3.1.3. HIV stigma among PrEP users and providers—HIV stigma among PrEP users and providers was stated as a large barrier to access. Informants referred to how some doctors, especially at other (formal sector insurance government) clinics, have asked "what is [PrEP], what are you talking about?" and "do you already have HIV, is that why you are taking this medication?" (PID15) or made discriminatory comments, judged patients for not using condoms, or refused to attend patients altogether. Additionally, many PrEP users do not want "to go to a clinic that is a specialist in caring for people with HIV" as they worry "that someone will see [them], will recognize [them], and think that [they] live with HIV" (PID1). Reducing wait times was also mentioned to help reduce this anxiety of being seen at the clinic. Other informants emphasized the need to:

> "Stop seeing or only naming La Clínica Condesa as the clinic specialized in the care of patients or people with HIV. Rather reinforce that the clinic also has other services, right, like those of prevention […] you do not only go for an issue of living with HIV."
>
> (PID1)

One suggestion to try to reframe clinics as not just HIV clinics was utilizing social media campaigns to promote their other services. For instance, La Unidad Trans has "distanced [itself] from the Condesa clinics and the large social burden they have" (PID16) being seen as HIV clinics by focusing on hormonal therapy, psychological and psychiatric services, and general health promotion. They have also reduced barriers to access by having transgender individuals make up half their staff so that "users feel identified with La Unidad, they start to make it their own, then they start to seek more services" (PID16). Informants stressed the importance of efforts to hire more workers from the target populations, keeping in mind the discriminatory obstacles they face in completing their education.

3.1.4. Demedicalizing treatment—A common sentiment among informants was the need to demedicalize PrEP to make it more accessible among PrEP users. One

doctor claimed that “the biggest impediment to giving a medication like PrEP, which is antiretroviral, is the medical prescription” (PID11). A counselor supported this, suggesting “a change in legislation, both local and federal” to characterize PrEP “not as a drug, but as a mechanism, a prevention strategy, just like condoms” (PID9). Therefore, patients would not need to pass through the doctor’s office and pharmacy in addition to the counselors, preventing patients from waiting “three, four hours in the waiting room to receive a consultation where they [are given] nothing more than the prescription” (PID11). Moving away from medicine also “makes people feel much more comfortable when they are receiving care” (PID16).

3.1.5. Decentralizing care and increasing inter-organizational collaboration

—Informants also discussed diversifying access to PrEP and reducing oversaturation by decentralizing care. As of December 2022, only six sites were giving PrEP in Mexico City (Cifras, 2022) and far fewer or none in other parts of the country, causing PrEP users to commute four to five hours and “even change information to say they are residents to be able to access [PrEP] because it is not possible in their states” (PID1). Since MSWs follow specific travel paths, one doctor claimed that “it is important to make a map of these cities […] and to try to have at least one site that can implement PrEP at these points” (PID12). With the population of PrEP users being so mobile, informants advocated for a shared national database among implementation sites to create a network of collaborators to refer PrEP users, access previous medical information, give telemedicine services, and carry out prescriptions from afar. Without this network, PrEP users “are going to lose the medication, they are going to use the continuity” or, worse, “we can lose those users” (PID12) altogether.

Beyond expanding access to other cities, several informants indicated that the best places for PrEP are NGOs “because their administrative structures are simpler” so personnel “have more time and more sensitivity to be able to give [PrEP users] all the information” (PID11). These organizations “can be a little closer to people” (PID11) than the government because they “already [know] the population and the population already trusts them” (PID4), with the staff often belonging to the key populations themselves, and “that’s all the difference from being on this side with the government logo” (PID4) or from being seen at a clinic that specializes in HIV. Moreover, informants stated it is crucial to coordinate with NGOs to be able to offer population-specific services, because, as one administrator explained, “where it is functioning is at Unidad Trans where the staff is trans, and the site is exclusively for trans people […] they need specific services” (PID6).

3.2. Improving quality of care of PrEP users

Informants emphasized the importance of improving the quality of care by approaching PrEP users with more empathy, enhancing knowledge and training among staff, increasing the continuity of personnel, and promoting information among patients.

3.2.1. Empathy of providers

—Empathy was noted to be crucial to increasing quality of care because as one administrator explained these key populations have been marginalized and “live in very violent contexts” (PID4). They have a lot of fear, because “governments have done clean-ups, right? Social clean-ups, of sex workers, of people living

on the street, of people consuming" so "what reason would they have for trusting us? […] working with a lot of empathy, awareness makes them trust us and then they come alone" (PID4). Informants noted that this distrust results in difficulties attracting poorer, less-educated users, so it is also important to be flexible with appointment times and identification requirements for populations who may not have ever received an identification due to discrimination.

3.2.2. Trained personnel—Informants highlighted the widespread stigma in HIV care that reduces the quality of care. One doctor mentioned:

> "Most health professionals do not have much interest in this issue, sexually transmitted HIV infections. Or, in the worst cases, they have certain stigmas against the main population that uses PrEP: MSM and TGW. So apart from the training in the implementation of PrEP, this problem of the lack of training on gender must also be solved."
>
> (PID11)

Informants urged the need to sensitize staff to gender identity and diversity, treatment options and protocols for different populations, PrEP selection criteria, to not stigmatize infections or forms of prevention, and to carry out substance use harm reduction in response to the rise in substance use. One doctor emphasized this lack of training, claiming that "everything I learned or everything that I can say that I know up to now is due to my own concern or my own interest" (PID16). Informants mentioned that this training would also help make services "not as medicalized, [because the staff] understands vulnerability processes, social stigma and discrimination social processes, human rights" (PID2).

A severe lack of population-specific protocols was also noted. One doctor described this frustration, stating "I can't pick up a book on pediatrics […] on gynecology or even endocrinology that talks exclusively about the trans population because they don't exist" and some services cannot be offered as their effectiveness "[has] not been proven in trans people […] because we just don't have studies" (PID16). Informants indicated that future steps to improve the quality of care should involve implementation sites conducting more pilot studies targeted toward understudied populations.

3.2.3. Lack of information among PrEP users—Similarly, informants indicated a large gap in information among PrEP users, reducing their ability to utilize the services offered. Informants referred to patients' false conceptions of what a true HIV risk is, what it means to be undetectable with HIV, or that taking PrEP is safe. Informants referenced many users who are "about to be included [in PrEP] and they don't really know what it is and what it works for" (PID1). Beyond supplying patients with PrEP, informants mentioned that attending a clinic also provides PrEP users a crucial channel to learn more about HIV and other infections, aspects of their sexual health, violence-related legal services, and other organizations or support groups which they can then pass along to others; however, it was repeatedly noted that "most of the information on PrEP is usually very medicalized […] a very small amount of information is accessible to users" (PID9). One doctor highlighted this, stating "you don't really strictly need a doctor to tell them […] 'take this pill.'

Rather you need a person who can give them information in a simple way and in a way that they can use for themselves" (PID11). Informants emphasized that targeting this lack of information among patients is crucial for PrEP users to be able to best utilize the comprehensive services offered, thus improving the quality of care they receive.

3.2.4. Personnel shortages—There was a strong consensus among informants that the main limiting factor in improving the quality of care is a lack of personnel which is "not growing at the same rate that the demand of the population is growing" (PID10). Most informants believed that physical space to put more personnel was not an issue because either there was enough space or rather the solution required improving contracts to reduce unexpected personnel shortages or utilizing an increased staff to expand hours within the available spaces. They explained how expanding hours of service would increase accessibility to populations, particularly sex workers, who may struggle to attend the current hours due to work or travel reasons as well as help to reduce oversaturation of PrEP users. One informant from Inspira claimed they "only offer [PrEP] services two days a week and one weekend day" (PID15), but with more personnel they could offer it every day. Informants claimed that the main contributing factor to shortages was precarious contracts. One doctor emphasized this issue:

> "Many of the staff here […] are contract staff that come from the federal level. And these contracts in recent years have been very irregular. They have not been continuous […] They work some months, rest others. They came 15 days, right now they are resting again, and we don't know when they are going to return."
>
> (PID12)

An administrator reported that "from January to [June they] didn't have staff, nor contracts, nor salaries, and [they] had 680 users in follow-up" (PID 14). Moreover, sites tend to lose personnel when there is a break in contracts because "they move to other places or they go to other clinics" and with them, clinics lose "all their training, all their knowledge" (PID12). Informants noted that the staff shortages resulting from unstable contracts increase wait times and reduce the focus a provider can place on each patient, thus decreasing quality.

Several informants also suggested having someone contracted specifically to manage the diffusion of information as "there is not a safe place or a good source that has all of the information available about what PrEP is" (PID2) and most of the current information is very medicalized. Informants highlighted that this role should involve creating a website that compiles all information on PrEP together in an accessible manner, running social media accounts, making posters or QR codes for patients to scan and view while in line, and promoting other services to help reframe these clinics as not just HIV clinics.

3.3. Improving organizational and structural support

The third theme underlined by informants as crucial to address prior to scale-up was organizational and structural support. This encompassed minor issues with the supply chain as well as a greater need for national involvement and international support.

3.3.1. Supply chain—Most informants agreed that there were no major problems with the supply chain or with the financing of supplies, claiming “we do not have a problem with supplies, more so with contracts” (PID13) and “the only problem that I see is the lack of human resource” (PID2). That said, a few respondents did mention occasional difficulties obtaining sufficient 4th generation tests, hepatitis B tests and vaccines, syphilis tests and treatment, anal swab tests, STI antibiotics, supplies for substance use harm reduction kits, or psychiatric medications for substance users, and lubricants or medications arriving with close expiration dates.

3.3.2. National support & guidelines—The federal government’s role in PrEP was noted to be severely lacking in terms of financial support for preventative care, opportunities for dialogue, knowledge and sensitivity, and diffusion of information. Regarding financial support, key informants explained the importance of the federal government dedicating a portion of its budget toward prevention strategies, particularly toward regular personnel contracts, as treatments are “much more expensive for the government” (PID1) than prevention; however, currently, there is a “complete lack of dialogue and of collaboration and of interest” on “the topic of prevention” (PID6). Therefore, informants emphasized the need for studies to collect concrete data on the cost-benefit of preventative care to help convince the government that clinics “will save, not only in terms of diagnosis, […but] in terms of care and in terms of hospitalizations” (PID17).

Apart from Mexico City, the financial and collaborative support of local governments was noted to be low in most of Mexico. Nevertheless, informants highlighted that this support must come from the federal level to establish national PrEP and reduce the current over-centralization and saturation in Mexico City. Informants also suggested collecting and sharing more data with the government in order to create much-needed national guidelines for specific populations other than MSM on both supplying and using PrEP and designating a portion of the budget toward having a staff position in charge of creating these national protocols. Currently, there are “no national guidelines and I think they can be created with the experience that [Clínica Condesa has] from PrEP” (PID12).

3.3.3. International involvement—Informants agreed that international support is always going to be important because “we have resources from the federal government, but they are limited” and often not designated toward prevention whereas resources from “international agencies are a little more flexible to be able to promote prevention” (PID2). Specific areas mentioned in which international support would be especially crucial included supporting continuous personnel contracts, funding to create a singular platform compiling accessible PrEP information for a diversity of populations, and implementing future pilot incentive programs with hard-to-reach populations.

4. Discussion

This study used a qualitative approach with in-depth informational interviews among clinical providers and administrative staff to evaluate the challenges and successes of PrEP implementation and the barriers to be addressed prior to national scale-up. Findings from

these interviews indicate three main issues: making care more accessible, improving the quality of care, and enhancing organizational and institutional support.

The most successful components of PrEP accessibility highlighted by informants included the PrEP users' experiences with PrEP itself and at these clinics. Factors that informants stated need to be scaled up to increase access were utilizing population-specific incentives, being more flexible with appointments and inclusion criteria with hard-to-reach populations and going directly to the places they live and socialize to recruit them, hiring staff from the key populations themselves, involving NGOs who have more trust from and knowledge of these populations, removing the PrEP prescription requirement, expanding care to cities across Mexico, and having population-specific sites. Regarding improving the quality of care, common themes mentioned by informants were having an accessible platform with demedicalized information, training personnel to care for a diversity of populations, and conducting population-specific research to establish more informed care standards. Although there were few issues with the supply chain, areas of improvement regarding organizational and institutional support included increasing governmental and international financial support and collaboration to establish a larger prevention budget, continuous contracts, and population-specific national care guides.

One commonly discussed theme to increase accessibility was incentives. Many informants believed that these incentives were irrelevant to increasing adherence in the more educated and relatively wealthier MSWs population and therefore must be targeted toward more susceptible populations. Despite the informants' uncertainty about the effectiveness of incentives, quantitative analysis from PrEP Seguro demonstrated 26 to 33 percent improvements in adherence (Galárraga et al., 2023). This is a crucial increase in adherence, yet one that may be difficult to note in clinical practice since not every PrEP user will follow this trend and personnel are simultaneously focusing on providing care. This contrast in informant perception versus demonstrated results of incentives' effect on adherence emphasizes the importance of programs that increase buy-in among key stakeholders. Another unexpected result in the present study was the large emphasis informants placed on populations other than MSM, particularly TGW and people experiencing homelessness. Future research should focus on better understanding the distinct ways to recruit, care for, and reinforce adherence in these communities.

The issues highlighted here are very common in other settings. For instance, we draw parallels to another Latin American study exploring PrEP awareness in the Caribbean which also found that a major facilitator to uptake was non-judgmental and confidential services, whereas a barrier identified by PrEP users was the cost of PrEP, even though PrEP is free (Augustus et al., 2023). Therefore, as highlighted by informants in our interviews, this study also emphasized the importance of providing accessible information to address misconceptions like this. Similarly, an ImPrEP study exploring factors associated with PrEP engagement among TGW in Brazil, Mexico, and Peru further parallels our findings of the need for population-specific interventions (Konda et al., 2022); however, this study also indicated the need to explore long-acting PrEP strategies for TGW, which would likely be a relevant solution to attract other highly-mobile key populations like MSWs discussed in our study. Lastly, similar to our findings, a study investigating same-day oral

PrEP implementation among MSM and TGW in ImPrEP mentioned utilizing social media campaigns as a powerful tool to reach key populations, specifically younger individuals (Veloso et al., 2023). They further suggested using newer social media platforms and employing digital influencers as an avenue to further inform and recruit these younger key populations, a method not considered here but likely highly relevant to our findings.

These parallels in other settings suggest that our findings are likely highly applicable to other LMICs or HIV-concentrated epidemic settings experiencing low PrEP utilization. Specific trial studies are needed for each LMIC to explore population-specific incentives, local NGOs to incorporate, supply chain issues, government relationships, human resource barriers, training needed, best platforms to diffuse information, and hardest-to-reach populations, as all of these may vary by location; nonetheless, the present study highlights the importance in any LMIC facing an HIV epidemic of identifying the hardest-to-reach populations and reducing barriers to access and improving the quality of care in these populations by being more flexible and empathetic, promoting services apart from HIV care, increasing staff representation of these populations, utilizing incentives, decentralizing care, demedicalizing both prescribing PrEP and information about PrEP, increasing diffusion of this information, performing population-specific research, and garnering greater government and international support to establish designated prevention budgets, continuous personnel contracts, and population-specific care guidelines.

A major strength of this study is that interviews included informants serving various clinical roles from both smaller and larger governmental and non-governmental clinics. This diversity of perspectives adds a comprehensive analysis to the scarcity of research exploring scaling up PrEP nationally in Mexico. Moreover, this study is the first to qualitatively explore the successes and challenges of the PrEP Seguro program and how these incentives can be adapted for future implementations in other populations. Notwithstanding, there are several limitations to the present study. These include that, unexpectedly, many informants were not familiar enough with PrEP Seguro to be able to speak to it, resulting in a narrower scope of responses. Additionally, although this study featured a diversity of informants, there was a lack of informant participation from outside of Mexico City, the federal government, or other (formal sector insurance government) clinics, making the informants' criticisms of care at those clinics somewhat less reliable. Lastly, many of the informants were Mexico City government employees and thus unlikely to critique local government efforts.

5. Conclusions

Overall, these findings suggest that current PrEP care in Mexico is limited to a few overcrowded clinics and remains highly inaccessible. Efforts to make care more accessible by utilizing population-specific incentives, decentralizing care to other cities, incorporating NGOs, and demedicalizing PrEP; to improve quality of care by promoting continuity of staff and more comprehensively training staff to provide informed, population-specific care; and strengthening national and international collaboration and support of PrEP and other related prevention services are all crucial to achieving universal PrEP access in Mexico.

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Data availability statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Appendix A.: Introduction Letter

Study Title: Characterizing the impact and scale-up potential of a conditional economic incentives program to promote PrEP adherence among Male Sex Workers and assessing barriers and facilitators to PrEP distribution: a mixed-methods study in Mexico City*

*Please note that this is the original introduction letter and the title of the study has since been changed.

Invitation to Participate in a Key Informant Interview: English Version.

Study Implementers: Brown University School of Public Health (USA)

Study Investigators: Sarah Reichheld and Dr. Omar Galárraga.

Participation

This letter serves to invite you to be part of a research study conducted with the Brown University School of Public Health (USA). This study is voluntary.

Study Topic

This is a follow-up study to the recently completed PrEP Seguro trial (ClinicalTrials.gov Identifier: NCT0367498) which aimed to promote PrEP adherence for HIV prevention by testing the extent to which user-centered conditional economic incentives helped increase adherence to free PrEP among MSWs in users of Clínica Condesa Especializada's services in Mexico City. The purpose of this follow-up study is to hear your opinions on the PrEP Seguro trial (if you were involved), current PrEP access and distribution in Mexico, and ways both can be improved for future related implementations.

Interview Format

If you choose to participate in this study, you will be part of a 45-min informational interview. I will ask questions exploring the successful components, challenges, and impact achieved in PrEP Seguro trial and PrEP distribution in general, and its context for future implementation (surrounding implementation sites, supply chain demands, and government support). I also hope to hear any other ideas or suggestions you have about the program. You can stop or take a break from the interview at any time. All interviews will be conducted in Spanish and audio recorded. Your name will not be linked to your audio recording and the recording will be encrypted and stored in a digitally secure format. Your name will not be included in the publication.

Benefits to Participating

Your participation may not directly benefit you. The aim is that your contributions to this study will be included in a paper and submitted to a peer-reviewed journal to allow for more effective future implementations to improve access and adherence to PrEP in sites across Mexico and other similar countries. Findings from this research may be shared with researchers at Brown University in the United States, stakeholders at Clínica Especializada Condesa, and other PrEP distribution sites in Mexico.

Questions

If you have any questions about your participation in this study, you can contact: Sarah Reichheld - sarah_reichheld@alumni.brown.edu or Omar Galarraga, PhD - omar_galarraga@brown.edu.

Appendix B.: Semi-structured Interview Guide (English Version)

Questions Specific to PrEP Seguro: Intervention Characteristics

- Relative Advantage: Tell me about your experiences with the Seguro program. What has your involvement been? In your opinion, what has been most effective at increasing PrEP access and uptake in the PrEP Seguro program compared to normal PrEP?
- Design Quality and Packaging: Which components of the program (counseling, incentives, etc) have been most successful? Which components of the PrEP Seguro program need to improve and how could they be improved?
- Adaptability: Tell me about how you think the PrEP Seguro program can be more effective going forward. Do you have any recommendations to improve the program so that it can better meet the needs of your site?
- Cost: Tell me about financing challenges that occurred while implementing PrEP Seguro. Tell me about supply chain challenges that occurred while implementing PrEP Seguro. What actions are needed to address these issues during future implementation?

Process

- Reflecting & Evaluating: Tell me about an unexpected challenge you faced with implementing PrEP Seguro? How do you think these challenges can be addressed during future PrEP Seguro trials?

Characteristics of Individuals

- Knowledge and Beliefs about the Intervention: How do you think the participants have responded to the PrEP Seguro program? Positively? Negatively? What have you heard from participants about their experience in the program?
- Individual Identification with Organization: How (if at all) has PrEP Seguro influenced Male Sex Worker's interest in participating and remaining adherent to PrEP?

Inner Setting

- Available Resources: Tell me about the challenges at the implementation sites. What specific resources do you think PrEP Seguro could provide to the sites in future trials? Are there sufficient doctors, counselors, and supplies of drugs and other materials? Are there specific sites that did not participate in the PrEP Seguro trial but that you think would be appropriate for implementing the program in the future? Tell me about those sites and why you think they would be appropriate for future implementation. How much were the incentives proportional to the sex workers participating and adhering to PrEP? What improvements would you propose for a future implementation with incentives?

Outer Setting

- External Policies and Incentives: What do you think about the (local/federal) government's role in implementing the PrEP Seguro program? Probe for support/lack of support. What changes need to be made in order for PrEP Seguro to garner greater government support? What changes would allow PrEP Seguro to work more collaboratively with local and federal governments?

General PrEP Questions: Intervention Characteristics

- Relative Advantage: Tell me about your experiences with the PrEP service. What has your role in the implementation of the PrEP service been?
- Design Quality and Packaging: What component(s) of the PrEP service (counseling, support groups, medical services, etc) have been most successful? Which components of the PrEP service need to improve and how could they be improved?
- Adaptability: Tell me about how you think the PrEP service can be more effective going forward. Do you have any recommendations to improve the program so that it can better meet the needs of your clinic's population? Do you

think that incentives could be an effective strategy to improve the use of PrEP of certain populations? Why or why not? For which populations? If yes, how would you implement them?

- Cost: Tell me about financing challenges that are occurring with implementing and distributing PrEP. If they exist, tell me about supply chain challenges that are occurring with PrEP. What actions are needed to address these issues? What other factors are limiting the current distribution of PrEP and how can these barriers be eliminated? If PrEP distribution is able to continue at your site, what would it require to be financially stable (grant funding, government support, etc)?

Process

- Reflecting & Evaluating: Tell me about an unexpected challenge with the current implementation and distribution of PrEP. How do you think this challenge can be addressed in the future of PrEP?

Characteristics of Individuals

- Knowledge and Beliefs about the Intervention: How do you think the participants have responded to PrEP? Positively? Negatively? What have you heard from participants about their experience?

Outer Setting

- External Policies and Incentives: What do you think about the (local/federal) government's role in implementing PrEP? Probe for support/lack of support. What changes need to be made in order for PrEP to garner greater government support? What changes would allow this clinic and other distribution sites to work more collaboratively with local and federal governments?

Do you have any other general comments or suggestions that you would like to contribute or are there any topics we haven't covered?

List of abbreviations

AIDS	Acquired Immunodeficiency Syndrome
CEI	Conditional Economic Incentive
HIV	Human Immunodeficiency Virus
LMIC	Low- and Middle-Income Country
MSM	Men Who Have Sex With Men
MSW	Male Sex Worker
NGO	Non-Governmental Organization

PrEP	Pre-Exposure Prophylaxis
TGW	Transgender Women

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Table 1

Potential additional target populations for CEIs.

Population	Evidence of Needed Support	Suggestions for Incentive Type
TGW [1]	TGW "have little access to health services" (PID4), are very "marginalized, discriminated, stigmatized" (PID4), and "more complicated to retain" (PID16). Therefore, "an incentives project for TGW would be very useful" (PID6) and "could be very attractive" (PID3).	Transport cards, grocery vouchers, lunches, hormonal therapy
People experiencing homelessness [1]	Incentives "could help them a lot" as otherwise "they are difficult to recruit" (PID11). Specifically, street sex workers "have an HIV prevalence of over 30 percent" and "we are failing to reach. Who of course need PrEP. And, there, incentives are extremely valuable" (PID4).	CEIs, transport cards, grocery vouchers, or lunches
Adolescents [2]	"We don't have the youngest students" (PID14) in PrEP because "it's hard to see adolescents […] due to issues of discrimination and stigma […] We lose the years in which they have the greatest rates of infection [… and] risk due to violence" (PID6). Incentives "could help adolescents adhere to both services and medicine" (PID5).	Transport cards
Women, especially female sex workers (FSWs) [3]	"Give [incentives] to women" (PID5) as "women have a much higher level of poverty than MSM" (PID6). Particularly in FSWs incentives "would be very effective" (PID14) because they are "a difficult population that deserts, abandons the program quickly due to mobility" (PID12) and PrEP "has not been socialized" (PID14) with them.	Transport cards, CEIs (specifically for FSWs to compensate for work missed to attend clinic), grocery vouchers, or lunches
Substance users [3]	Substance users have a lot of distrust and often arrive with "a pre-established idea that they are going to be rejected" (PID9) from receiving care. Therefore, "it is a population that [would] greatly benefit" (PID10) from incentives.	Harm reduction kits

Legend of table: 1 = most mentioned, 3 = least mentioned.