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## Providers' Attitudes and Experiences with Pre-Exposure Prophylaxis Implementation in a Population-Based Study in Kenya and Uganda

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### Abstract

Pre-exposure prophylaxis (PrEP) implementation is underway across sub-Saharan Africa. However, little is known about health care providers' experiences with PrEP provision in generalized epidemic settings, particularly outside of selected risk groups. In this study (NCT01864603), universal access to PrEP was offered to adolescents and adults at elevated risk during population-level HIV testing in rural Kenya and Uganda. Providers received training on PrEP prescribing and support from local senior clinicians. We conducted in-depth interviews with providers ( $n=19$ ) in four communities in Kenya and Uganda to explore the attitudes and experiences with implementation. Transcripts were coded and analyzed using interpretivist methods. Providers had heterogeneous attitudes toward PrEP in its early implementation: some expressed enthusiasm, while others feared being blamed for "failures" (HIV seroconversions) if participants were nonadherent, or that offering PrEP would increase "immorality." Providers supported PrEP usage among HIV-serodifferent couples, whose mutual support for daily pill-taking facilitated harmony and protection from HIV. Providers reported challenges with counseling on "seasons of risk," and safely stopping and restarting PrEP. They felt uptake was hampered for women by difficulties negotiating with partners, and for youth by parental consent requirements. They believed PrEP continuation was hindered by transportation costs, stigma, pill burden, and side effects, and was facilitated by counseling, proactive management of side effects, and home/community-based provision. Providers are critical "implementation actors" in interventions to promote adoption of new technologies such as PrEP. Dedicated training and ongoing support for providers may facilitate successful scale-up.

**Keywords:** HIV prevention, pre-exposure prophylaxis, health personnel, Africa south of the Sahara

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## Introduction

EVIDENCE FROM CLINICAL trials has shown significant effectiveness of oral pre-exposure prophylaxis (PrEP) in protecting against HIV infection.<sup>1–3</sup> PrEP is now a key component of a comprehensive evidence-based HIV prevention toolkit.<sup>4</sup> PrEP is being rolled out across sub-Saharan Africa (SSA), with a focus on populations at elevated risk: adolescent girls and young women (AGYW), serodifferent couples, female sex workers, transgender women, and men who have sex with men. Although antiretroviral therapy (ART) has been widely scaled up across much of SSA, PrEP is new to clients and providers in many settings.

Experience from PrEP rollout in the United States and other settings has demonstrated that providers' knowledge, attitudes toward PrEP and HIV prevention, and comfort with discussing sexual health and HIV risk can all influence PrEP uptake and use.<sup>5–12</sup> However, little is known regarding experiences with providing PrEP in generalized epidemic settings, particularly when offered to persons outside of specific risk groups. Thus, understanding the attitudes and experiences of PrEP providers in contexts where PrEP is offered universally is critical for informing global implementation.<sup>13</sup>

Most studies that have examined providers' attitudes toward PrEP in SSA have explored knowledge and hypothetical willingness to prescribe PrEP before initial rollout. Among providers in Tanzania who had not yet prescribed PrEP, 3.5% had prior knowledge of PrEP; the majority (61.1%) expressed willingness to prescribe once informed.<sup>14</sup> However, cultural norms around sexuality and concerns about behavioral disinhibition were reported as provider-level barriers when envisioning delivery to AGYW in Tanzania<sup>14</sup> and South Africa, Kenya, and Zimbabwe.<sup>7,15</sup> Among providers surveyed about hypothetical PrEP provision in Kenya, Uganda, and Botswana, the most commonly anticipated client-level barriers to PrEP service delivery included cost, risk compensation, and drug adherence and resistance,<sup>16</sup> whereas providers in Rwanda were concerned about stigma, access, and family support for uptake.<sup>17</sup>

In South Africa and Uganda, providers who had not yet provided PrEP reported disparate levels of understanding and comfort with acknowledging serodifferent couples' prevention needs.<sup>18</sup> Similarly, a study in South Africa found that many antenatal care providers had not heard of or had inaccurate knowledge about PrEP.<sup>19</sup> Further, studies from Kenya pointed to the importance of PrEP provider training before implementation, but acknowledged the human resources burden of such training.<sup>20,21</sup>

The evidence base characterizing the attitudes and experiences of providers already engaged in PrEP delivery in SSA is still relatively limited.<sup>22</sup> In a study among PrEP providers for AGYW in Zimbabwe, providers felt that, while not always possible, adherence could be enhanced through disclosure of PrEP use to partners and/or parents.<sup>23</sup> While providers reported comfort with providing PrEP to AGYW who were married, had an older partner, or had sexually transmitted infections (STIs), some expressed personal discomfort with the idea of AGYW accessing PrEP, while at the same time recognizing its importance.<sup>24</sup>

On the contrary, PrEP providers in Kenya were ambivalent about offering PrEP to AGYW who were married, with an older partner, or had STIs, and perceived drug-related bar-

riers as the key challenge to uptake.<sup>25</sup> Providers of PrEP to serodifferent couples in Kenya viewed it as an opportunity for better monitoring of client health outcomes<sup>26</sup> and a cost-effective option for clients attempting pregnancy.<sup>27</sup> Further, they reported that training had resulted in significant improvements in their knowledge and confidence, as well as diminished concerns about the negative impacts of PrEP use on sexual risk behavior.<sup>28</sup> A study in Cape Town, South Africa, found limited knowledge of PrEP among providers working with pregnant women, but also found support for PrEP use to reduce the risk of seroconversion during pregnancy among serodifferent couples.<sup>29</sup>

To date, however, little is known about providers' attitudes toward and experiences with community-wide PrEP delivery in SSA, which is critical for informing implementation and successful service delivery to foster PrEP uptake and adherence. The purpose of this study, therefore, is twofold: (1) to explore providers' attitudes toward PrEP and experiences with PrEP delivery, and how this influenced implementation; and (2) to understand the barriers and facilitators encountered by providers when offering PrEP in the context of its early implementation.

## Methods

### *PrEP implementation in the Sustainable East Africa Research in Community Health study*

Sustainable East Africa Research in Community Health (SEARCH) was a population-based universal HIV testing and treatment (UTT) trial (NCT01864603) in 32 rural communities across 3 regions of Kenya and Uganda, which tested the impact of its model of community-based, multi-disease, patient-centered approaches, on HIV incidence, mortality rate, and other community health outcomes.<sup>30</sup> SEARCH successfully achieved near-universal HIV testing and in 2016–2017 began broadly offering PrEP in 16 intervention communities before a national PrEP rollout in Kenya and Uganda.<sup>31</sup> Communities were sensitized about PrEP 1 month before the initiation of community-wide HIV testing, and group education on PrEP was provided during community health fairs.<sup>32</sup>

Enhanced individual counseling on PrEP was offered to persons with an elevated risk of HIV acquisition based on at least one of the following categories: persons in serodifferent partnerships; those classified as being at risk based on an empirical HIV risk prediction algorithm developed using machine learning;<sup>33</sup> and persons who self-identified as being at risk. Rapid or same-day PrEP initiation (with medication provided by the study) was offered at local government clinics (with one-time, study-provided transport). In 14 of 16 communities, on-site PrEP start was also offered at health fairs.

From 2017 to 2018, SEARCH also offered on-site PrEP initiation during HIV testing events for key populations in selected communities.<sup>34</sup> Participants  $\geq 15$  years who were eligible for PrEP (i.e., HIV antibody negative, no hepatitis B infection, and no symptoms of acute HIV) were provided daily oral PrEP (tenofovir disoproxil fumarate 300 mg with emtricitabine 200 mg or lamivudine 150 mg) free of charge. A flexible delivery system was provided, with follow-up visits at locations preferred by the participant (e.g., clinics, participants' homes, or other community sites) at weeks 4, 12, 24, and every 12 weeks thereafter for up to 144 weeks.<sup>31</sup>

### *Provider trainings*

As PrEP was implemented in this study before the release of national guidelines, providers received multi-day, interactive PrEP clinical training with case-based discussions and role-playing, including an overview of effectiveness, indications, clinical eligibility, potential side effects (both common side effects of PrEP such as nausea and headache, as well as more serious potential side effects such as renal dysfunction and loss of bone mineral density), prescribing, duration of use during periods of risk, management of missed doses, concomitant use of other prevention approaches, and adherence measures. A case-based approach was used to provide instruction on management of potential complex PrEP cases, such as PrEP in pregnancy and the management of suspected acute HIV infection. All clinicians received ongoing support from local senior clinicians to address clinical questions in real time.

### *Qualitative study design*

A qualitative study embedded within SEARCH explored factors related to PrEP uptake or noninitiation, as well as adherence and discontinuation, among community members, clients, and health care providers. For this analysis, we focused on results obtained from baseline data collected from PrEP providers, to explore their attitudes toward and experiences with PrEP provision soon after implementation started. Data were collected after the first several months of initial PrEP implementation from January to September 2017.

### *Sample*

A purposive sample of PrEP providers in clinics serving four rural SEARCH intervention communities across the three regions were selected and recruited to participate in qualitative in-depth interviews (IDIs). Providers ( $n = 19$ ) were purposively sampled from a list of PrEP providers in the clinics to include representatives across all cadre of providers engaged in delivering PrEP, including clinical officers, nurses, community-based nurse trackers, as well as PrEP “ambassadors,” who were community members taking PrEP and trained to help support others initiating PrEP. The team interviewed five clinical officers (clinicians responsible for evaluating and dispensing PrEP), seven study nurses (who support clinical assessment and provision of PrEP), two nurse trackers (responsible for delivering PrEP in the community), one counselor, and four PrEP ambassadors.

### *Data collection*

A gender-balanced team of six Kenyan and Ugandan researchers, trained in qualitative research methods, conducted semistructured IDIs using an IDI guide that explored topics, including their first impressions of PrEP and early experiences with provision, as well as health systems, community/social, and individual-level challenges and facilitators of PrEP uptake and engagement. Providers were asked to describe a typical day at the clinic providing counseling, treatment or PrEP, and the challenges and rewards of their work, to share their opinions about who might need PrEP in the communities they serve, and their perceptions of clients’ challenges with PrEP uptake and continuation. Interview guides explored these topics, allowing other unanticipated domains to emerge.

Guides were translated and back-translated to ensure content validity. Interviews lasted about 1–2 h and were conducted in providers’ preferred local language. Written informed consent was obtained from all providers. The research team transcribed audio recordings into English.

### *Data analysis*

Transcripts were inductively reviewed, discussed, and coded using a framework collaboratively developed by an eight-person analytic team, including Kenyan and Ugandan interviewers and researchers. The research team deductively and inductively coded the interview transcripts utilizing interpretivist approaches in the domain of theory-generative research for implementation science.<sup>35,36</sup> Team members developed an initial coding framework based on the theory-informed topical domains of inquiry of the interview guides. This coding framework was iteratively refined during data collection and analysis. Salient themes were then constructed and reviewed.

### *Ethical approvals*

The study was approved by the Makerere University School of Medicine Research and Ethics Committee, the Uganda National Council for Science and Technology, the University of California, San Francisco Human Research Protection Program and Institutional Review Board, and the Kenya Medical Research Institute Ethics Review Committee.

## **Results**

This analysis yielded several broad emergent themes regarding the attitudes and experiences of PrEP providers, and barriers and facilitators of community-wide PrEP implementation. Key themes were organized as follows: Heterogeneous attitudes toward PrEP; Concerns about client behavior and provider responsibility; Communication challenges; Population-specific concerns; Support for serodifferent couples; and Facilitators of continuation (Table 1).

### *Heterogenous attitudes toward PrEP*

Findings reveal heterogeneity in attitudes among providers of PrEP in its early implementation. Some providers expressed enthusiasm for PrEP, while others were ambivalent. Heightened HIV risk, evident among clients, helped motivate enthusiasm for PrEP. Providers also viewed PrEP as a tool to reduce their clients’ anxiety related to their HIV exposure risks, especially among serodifferent couples in which one partner experienced anxiety and awareness about regular risk through exposure and was unable to negotiate condom use. A “PrEP ambassador” explained, “PrEP helps them. After the encounter they don’t have to keep wondering if they are infected, they don’t have to be stressed over that” (Peer educator, female, Southwest Uganda).

On the contrary, providers also voiced concerns about the perceived acceptability of PrEP by clients, citing challenges with taking daily medication and the potential side effects among individuals who are not “sick”: “I was concerned that it was not going to be accepted, because remember, these are people who are not sick, and the drugs too have the side effects” (Nurse, female, Kenya).

TABLE 1. THEMES AND ILLUSTRATIVE QUOTATIONS OF PROVIDERS' ATTITUDES AND EXPERIENCES WITH PRE-EXPOSURE PROPHYLAXIS IN KENYA AND UGANDA

Theme	Elaboration	Data excerpts
Heterogenous attitudes toward PrEP	Enthusiasm for PrEP	<i>It is a good experience, seeing people who are at risk of contracting HIV getting protected from it. I personally think PrEP is a good idea... Clinical Officer, male, Eastern Uganda</i> <i>When a 24 year old man comes to you and tells you he is a fisherman with about 10 girlfriends, you see the need to give him PrEP. Nurse, female, Kenya</i> <i>PrEP helps them. After the encounter they don't have to keep wondering if they are infected, they don't have to be stressed over that. Peer educator, female, Southwest Uganda</i> <i>The clients complain when they have just started taking the pills. Say, out of 30 pills, they will complain when taking the pills! Nurse tracker, male, Southwestern Uganda</i> <i>I was concerned that it was not going to be accepted, because remember, these are people who are not sick, and the drugs too have the side effects. Nurse, female, Kenya</i>
Concerns about patient behavior and provider responsibility	Concerns about patients' ability to adhere to PrEP Fears of being blamed for PrEP "failures"	<i>My first question was whether PrEP will be sustainable. Will the clients manage to come for the drugs? Because we have all types of people here, especially the boda boda riders are ever busy... Nurse, female, Kenya</i> <i>My biggest fear was seroconversion. I was wondering if we would be able to ensure that these people stay HIV negative. Nurse, female, Kenya</i> <i>The clients on ART...said that we have brought PrEP which has made people more sexually active in this community. They were complaining that we have encouraged people to just have sex. They were also asking if we have now forgotten about condoms. Nurse, female, Kenya</i> <i>I felt [PrEP] would increase promiscuity, people would start sleeping anyhow because they are sure, they are taking PrEP and they are safe, so the level of promiscuity would so high... Clinical Officer, female, Eastern Uganda</i> <i>I thought to myself, now that PrEP has come, promiscuity will be on the rise... unwanted pregnancies, STDs will also rise. Peer educator, male, Southwestern Uganda</i> <i>I thought that people were going to start having serious unprotected sex; like tying a boom on the neck, a kind of self-suicide. Being on PrEP does not mean that one should stop using condoms and have unprotected sex, which community people seem to think. Nurse tracker, male, Southwestern Uganda</i>
Communication challenges	Assessing and explaining HIV risk Difficulties conveying complex adherence and stopping and restarting guidelines	<i>The question they ask, 'out of the many people that were there, why did they choose me to be at risk, am I the worst out of all those people? Clinical Officer, female, Southwestern Uganda</i> <i>I ask myself questions sometimes, because some people come for PrEP based on suspicion and no conclusive evidence that the partner is cheating or has other sexual partners. Clinical Officer, male, Eastern Uganda</i> <i>Most participants stop taking PrEP earlier than the time they inform us they have stopped—yet it is supposed to be that they first communicate to us on their desire to stop PrEP, and then we guide them on how to phase out slowly [...] We do not know who is taking really well and who is not. Nurse tracker, male, Eastern Uganda</i> <i>I was asking myself, for how long an individual should take PrEP? There was also a mixed feeling of PrEP vs. PrEP; which one gives a greater benefit? Nurse tracker, male, Eastern Uganda</i>

(continued)

TABLE 1. (CONTINUED)

Theme	Elaboration	Data excerpts
Concerns regarding serving specific client populations	Women Youth and adolescents	<p>Some of the women also say that their husbands have refused them to use the drugs; we have some who have returned the drugs because their husbands have refused. Nurse, female, Kenya</p> <p>[Youth] know that this is a clinic for HIV positive clients. So they have a feeling that if someone sees them coming to the HIV clinic, they may think that they are also HIV positive. For that reason they want to come very few times here at the clinic in a year. Nurse, male, Uganda</p> <p>Adolescents... come willing to be initiated on PrEP [...] but now for subsequent visits, it's either they haven't started using them or used them for two days and stopped. If you ask them the reason, they'll say like their parents refused and also heard from their friends that the drug is not a good thing. Clinical Officer, male, Kenya</p>
Support for serodifferent couples	Safety, morale, and harmony for couples	<p>Like the ones I saw last week [with HIV-positive partners], their morale was [high] since they started using PrEP. They have not been using condoms—this is a challenge on its own... and they are happy because they have been testing HIV negative. Clinical Officer, male, Kenya</p> <p>Like we know that a positive partner may suppress after taking ART. But since this is a lifelong treatment, at some point they are likely to be lazy to take up their medicine. So if the negative partner is on PrEP it helps to protect the negative partner from seroconverting. But also the positive partner will be motivated to take the medicine since the negative partner is also taking something. One participant came the other day and told me, 'my husband now is very happy because I am also taking PrEP. He is taking his ART medicine and I am taking PrEP. He is now motivated.' Nurse tracker, male, Eastern Uganda</p> <p>I realized that PrEP would help us a lot with discordant couples. PrEP is really working for such homes—using a condom is something terrible. Peer educator, male, Southwestern Uganda</p> <p>She went there with her husband. When she took her pill and realized that she was now safe, she felt her home was now strong. Peer educator, male, Southwestern Uganda</p>
Continuation facilitators	Counseling  Removing transportation and time barriers through community-based delivery	<p>Those who were referred from the clinic... are easy to be retained compared to those counseled at the [community health campaigns]... time was taken with them, so when they were consented on PrEP, they fully understood what it was all about... Clinical Officer, male, Kenya</p> <p>Now that we take [PrEP] to them, they feel relieved of the transport, and they feel like we care about them... we find out that they are tightly held up in their jobs until they have no time to come to the facility for the drugs. Nurse, female, Kenya</p> <p>You need to be closer to them. That doesn't mean that we are coercing them, but when they see you, they are reminded that there is something that I need to take up and they ask you, 'uh my medicine is finished; have you brought? I needed to come and test but I am busy doing some work, and cannot come there.' The [community-based delivery] needs to be strengthened so that we are able to sustain this PrEP program. Nurse tracker, male, Eastern Uganda</p>

ART, antiretroviral therapy; PrEP, pre-exposure prophylaxis.

### *Concerns about client behavior and provider responsibility*

Providers described having to reconcile their own and community members' opinions and views about PrEP with clinical recommendations, reflecting an early tension of wanting to avail PrEP to those at risk with worries that PrEP implementation may have negative consequences. Specifically, providers described being told that the introduction of PrEP resulted in more sexual activity and a rejection of condom use in the community:

The clients on ART... said that we have brought PrEP which has made people more sexually active in this community. They were complaining that we have encouraged people to just have sex. They were also asking if we have now forgotten about condoms. (Nurse, female, Kenya)

Offering PrEP, therefore, presented a "moral" dilemma for some providers, as they feared that PrEP could lead to increased risk behavior, HIV/STI incidence, and mistrust among couples. In addition, some providers were concerned about clients' ability to adhere to PrEP given the perceived pill-burden, complex guidelines around pill-taking, and ability to manage a daily medication given the prevalent geographic mobility of individuals. Thus, providers expressed fear about being blamed for potential PrEP "failures" (i.e., HIV seroconversion) in their communities.

### *Communication challenges*

PrEP was unfamiliar to many providers and national guidelines were not available before initiation of the study. Providers needed to learn quickly about prescribing PrEP, which was perceived by some to be complex. Moreover, early in the study, there was debate in the scientific community on the number of PrEP doses to achieve protective drug levels. In this context, many providers discussed finding it challenging to effectively communicate with clients about the usage and adherence, particularly explaining to clients that PrEP can be started and stopped as a person moves through "seasons of risk." Providers discussed wondering about providing PrEP in cases where the clients' risks were not evident; yet, as trained, they accepted clients' self-referral for PrEP even when HIV risk was not apparent.

As one clinical officer recounted, "I ask myself questions sometimes, because some people come for PrEP based on suspicion and no conclusive evidence that the partner is cheating or has other sexual partners" (male, Eastern Uganda). Some providers described uncertainty about how long individual clients should be on PrEP and about reconciling individual clients' patterns of PrEP use with recommendations for PrEP management. For example, a nurse tracker explained, "I was asking myself, for how long an individual should take PrEP? There was also a mixed feeling of PEP vs. PrEP; which one gives a greater benefit?" (male, Eastern Uganda).

### *Population-specific concerns: women and youth*

Providers felt that PrEP uptake was hampered for women by difficulties negotiating use with partners, and for youth younger than 18 years by their need for parental consent to use PrEP. Providers heard narratives from women and youth

about partners, parents, or friends disapproving of their PrEP use, resulting in clients returning the medication to the provider: "Some of the women also say that their husbands have refused them to use the drugs; we have some who have returned the drugs because their husbands have refused" (Nurse, female, Kenya). Providers also identified HIV stigma as a potential barrier for youth in terms of their willingness to attend appointments at the clinic regularly. A nurse pointed out that clinic characteristics impact youth engagement:

[Youth] know that this is a clinic for HIV positive clients. So they have a feeling that if someone sees them coming to the HIV clinic, they may think that they are also HIV positive. For that reason they want to come very few times here at the clinic in a year (male, Uganda).

Providers also relayed that common barriers to continuation of PrEP for all groups of clients included transportation costs, stigma, daily pill burden, and side effects. Over time in the study, PrEP was increasingly provided in community-rather than clinic-based settings.

### *Support for serodifferent couples*

Providers were very supportive of PrEP use in serodifferent couples. Providers described having seen, among disclosed serodifferent couples, mutual support and motivation for daily pill-taking, which facilitated relationship harmony and protection from HIV. Providers observed couples attending appointments and testing together, and described how these clients felt greater levels of morale, safety, and strength in their relationships and homes: "She went there with her husband. When she took her pill and realized that she was now safe, she felt her home was now strong" (Peer educator, male, Southwestern Uganda).

### *Facilitators of PrEP continuation*

Providers believed that continuation of PrEP usage was facilitated by counseling, proactive management of side effects, and home- or community- rather than clinic-based PrEP provision. They emphasized the importance of ensuring that clients understood how to use PrEP, which they felt would positively impact continuation. Providers also noted that the personal relationships they developed with their clients contributed to sustained use. In addition, when providing PrEP at home or community locations, providers observed relief and a sense of being cared for in their clients:

Now that we take [PrEP] to them, they feel relieved of the transport, and they feel like we care about them... we find out that they are tightly held up in their jobs until they have no time to come to the facility for the drugs (Nurse, female, Kenya).

These efforts to overcome time and transportation burdens were viewed by providers as facilitators of PrEP engagement.

## **Discussion**

To our knowledge, this is among the first studies to examine the attitudes and experiences of providers in SSA who have provided PrEP using a general population approach. It contributes new knowledge and providers' perspectives that are applicable to wider scale implementation contexts of population-based PrEP approaches. The findings showed that in the first

several months of implementation, providers held both positive views and concerns about PrEP, including previously unidentified provider fears of blame from the community and worry about potential contribution to new HIV seroconversions. Communicating about PrEP, including “seasons of risk” and duration of use, was challenging for providers, especially as new guidelines were released during the study.

Providers were concerned about barriers to access among women and youth, and enthusiastic about seeing the synergistic positive impact of PrEP on relationship quality and health among their clients in disclosed serodifferent couples. Providers believed that their positive relationships with clients and steps taken to lessen the logistical hurdles of time and transportation costs facilitated access and adherence to PrEP among their clients.

This study provides insight into providers’ views of key barriers and facilitators for the implementation of a population-based approach to PrEP that has been estimated to reduce HIV incidence by 74% compared with matched recent controls before PrEP availability.<sup>37</sup> Consistent with prior research from our team, the findings of this study suggest that early adoption of PrEP was facilitated by heightened HIV risk perception, serodifferent couple status, partner support, and clients’ positive interactions with providers,<sup>38,39</sup> conversely, distance from and travel to clinics for obtaining PrEP militated against uptake.<sup>40</sup> As evidence mounts to the effectiveness and challenges to community-wide PrEP implementation, identifying areas for enhancement and optimization to improve uptake and outcomes will help accelerate the benefits of PrEP into diverse populations and settings.

The literature on PrEP providers in SSA to date has focused on knowledge and hypothetical willingness to prescribe PrEP, with little data on providers’ actual experiences of PrEP provision, particularly when offered at scale and outside of specific risk groups. An exception is a recent study of facility-based PrEP delivery to general population clients in Eswatini, which found strong motivation to provide PrEP among health care workers.<sup>41</sup> Providers also emphasized the need for community-based services, particularly for reaching men. In the present study, providers were enthusiastic about the health and relationship benefits of PrEP use in serodifferent couples, in contrast to prior research finding that providers in some settings found it challenging to acknowledge serodifferent couples’ need for PrEP.<sup>18</sup>

In addition, while prior research among providers involved in targeted PrEP provision identified ambivalence and discomfort about providing PrEP to AGYW,<sup>14,15</sup> the providers interviewed in this study, who delivered PrEP broadly to adults at elevated risk, expressed more concern about the structural barriers that women and youth face while trying to access and adhere to PrEP. As was the case among providers who had not yet provided PrEP,<sup>14</sup> providers with actual PrEP provision experience in this study voiced both willingness and some ambivalence about PrEP, identifying potential targets for further provider support and education. However, notably, providers in this study voiced a previously unexpressed concern that clients and/or the public could view providers negatively should risk behavior and/or seroconversion in the community increase. This finding underscores the importance of viewing providers not only as they function in health systems, but as important and integrated social actors in communities.

In this study, the key barriers and facilitators to PrEP uptake observed by providers included those reported by clients in prior research in other settings. PrEP uptake and adherence have been hindered by “moral ambivalence” due to stigmatized behaviors associated with HIV, particularly affecting lower uptake among women and younger individuals.<sup>31,38,42–44</sup> Among pregnant and postpartum women in Kenya, having a partner living with HIV predicted PrEP continuation 1 month following initiation.<sup>45</sup> Evidence for these often-observed barriers and facilitators to PrEP engagement in the literature, and now reinforced by provider experiences, underscores the important role of partners and also the role that PrEP providers play in achieving optimal outcomes for PrEP. This analysis further identifies the importance of patient–provider relationships, and the potential positive impact of provider-facilitated removal of logistical hurdles (e.g., transportation costs) and encouraging partner support.

There are some limitations of this study and its generalizability. First, responses given by the providers may have been subject to social desirability bias. Second, data were collected during the beginning of PrEP implementation in these communities, and we did not include providers’ reports of their attitudes changing over time. At this time, PrEP was not yet available through national programs, and findings may represent only the early stages of implementation.

Finally, for parsimony, we have presented only major emergent themes from our analysis, and have not included in this article a presentation of minor themes or deviant cases. The study sample of providers was limited to the set of clinics in communities in which the qualitative study was conducted, and therefore, data may not have been fully saturated. However, the findings may serve as a useful reference for anticipating potential challenges to implementation of PrEP in new settings and of other novel HIV prevention technologies.

The findings from this study reinforce that providers are key implementation actors, and should be regarded among the first-line targets of interventions to promote adoption of new prevention technologies such as PrEP. As PrEP is expanded in many communities, supportive training and opportunities to share challenges and build peer support networks with other providers may help to strengthen providers’ critical role in the successful delivery of PrEP.

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### Authors’ Contributions

Conceptualization: C.S.C., E.D.C., and M.G. Writing—original draft: C.S.C., M.G., C.A.K., R.L.K., and E.D.C. Writing—review and editing: All authors. Data curation: L.O., C.A., H.I., A.O., R.B., F.A., and I.M. Formal analysis: C.S.C., M.G., C.A.K., R.L.K., L.O., C.A., H.I., A.O., R.B., F.A., and I.M. Project administration: J.A., M.A., A.O., F.M., N.S., and J.K. Investigation: G.C., M.L.P., C.R.C., E.A.B., M.R.K., D.V.H., E.D.C., and C.S.C. Funding acquisition: D.V.H., M.R.K., E.A.B., C.R.C., and M.L.P.



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No competing financial interests exist.

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