



Expanding PrEP Access Through Decentralized Delivery Models

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Abstract

Purpose of review This review examines emerging PrEP delivery models designed to expand access to HIV prevention outside of traditional clinic settings. It aims to synthesize recent evidence from these models on PrEP uptake, acceptability, and persistence, as well as geographic, social, and structural challenges, drawing on both the research literature and insights from recent programs.

Recent findings Recent studies have highlighted the potential of decentralized PrEP delivery approaches, including community-based distribution, pharmacy-based PrEP provision, telePrEP, and automated PrEP dispensing. These models can improve access, reduce stigma, and provide more personalized care. Hybrid approaches and integration of digital tools and peer support have also shown promise in enhancing adherence and retention. However, challenges related to effectiveness, scalability, regulatory constraints, and cost-effectiveness remain.

Summary Decentralized PrEP delivery models offer flexible, client-centered solutions that can significantly expand access to HIV prevention for vulnerable groups. Future research should focus on implementation and policy innovation to support integration of these models into existing health systems and reach underserved populations.

Keywords PrEP · HIV Prevention · Community PrEP · TelePrEP · Differentiated Service Delivery

Introduction

Pre-exposure prophylaxis (PrEP) represents a significant advancement in HIV prevention, offering a highly effective tool for individuals at substantial risk of acquiring HIV [1–3]. When taken as directed, oral PrEP reduces the risk of HIV transmission from sex by up to 99% [4–6]. Globally, PrEP use has increased steadily from 1.9 million people who received any method of PrEP at least once in 2021 to more than 8 million people in 2025 [7]. PrEP delivery has

mainly occurred through primary care and family planning clinics, research sites, and non-governmental organizations. Despite this progress, PrEP coverage remains far below the target of 10 million users by 2025 [8]. Barriers to accessing and continuing PrEP in clinical settings limit both uptake and sustained use.

Key challenges to PrEP use include structural barriers, such as long distances to PrEP clinics, difficulties in scheduling visits, and challenges obtaining and collecting prescriptions [9, 10]. Stigma associated with HIV and sexuality further hinders access for some key populations [11, 12]. In addition, healthcare practitioners frequently face barriers to prescribing PrEP, including limited training, resources, and time, as well as, in some settings, constrained drug supply. Complex clinical monitoring requirements and lengthy clinic visits can also discourage initiation and adherence to PrEP among users [9–13]. Together, these barriers limit PrEP uptake, persistence, and overall effectiveness, underscoring the need for innovative delivery strategies, such as expanding the range of providers authorized to prescribe PrEP and diversifying service delivery models, to improve

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Table 1 RE-AIM framework for review

RE-AIM Dimension	Evaluation Focus	Example Measures
Reach	Who did the intervention reach?	• Number and demographics of individuals accessing PrEP • Barriers to access identified through user feedback
Effectiveness	What are the outcomes of the intervention?	• PrEP initiation • HIV seroconversion • Persistence/Continuation
Adoption	Where and by whom was the intervention adopted?	• Type of non-clinic sites offering PrEP • Staff willingness and readiness to implement PrEP
Implementation	How consistently and well was the intervention delivered?	• Fidelity to protocols (e.g., screening, counseling, follow-up) • Costs • Use task-shifting or peer support
Maintenance	Was the intervention sustained over time?	• Continued service availability after pilot or funding ends • Integration into routine workflows

the acceptability of PrEP delivery and downstream clinical outcomes [12].

In 2022, the World Health Organization (WHO) released updated implementation guidance recommending differentiated service delivery (DSD) to simplify and de-medicalize PrEP [14]. DSD aims to streamline and adapt HIV services to increase person- and community-centeredness, thereby enhancing access and supporting effective use while reducing unnecessary burdens on health systems. Many WHO-identified DSD models reflect decentralized approaches, including delivering PrEP in community and virtual settings.

This review examines decentralized, non-clinic-based approaches for PrEP delivery, highlighting emerging models designed to expand access to HIV prevention, drawing on evidence from the literature and a select example of recent programs.

Methods

We conducted a targeted literature review to identify recent evidence on PrEP delivery outside of traditional clinic settings. On February 14, 2025, we searched PubMed using a predefined search strategy combining terms related to pre-exposure prophylaxis (PrEP) and non-clinic-based delivery models, including differentiated service delivery, patient-centered care, telemedicine, home delivery, and community-based services. Filters included studies published in

the past five years, in English, and involving human participants. The initial search yielded 1,183 articles after removing duplicates, which were exported into Covidence software. Studies were excluded if they did not present original data, did not report on actual PrEP delivery (e.g., studies focusing only on preferences, opinions, or recruitment), or described delivery solely in traditional clinic settings. We also reviewed relevant International AIDS Society conference abstracts and used Google Scholar to identify additional studies. This was not a systematic review but rather a structured overview to inform the development of our literature review.

Conceptual Framework

Decentralization is a critical strategy that can be applied to improve PrEP delivery, particularly in resource-limited settings. It involves shifting PrEP delivery from clinic settings to DSD sites and task-shifting from highly specialized cadres. Both approaches aim to enhance access, reduce health system burdens, and optimize outcomes through structural reorganization, leading to broader access. Delivering PrEP in non-traditional settings can potentially address access barriers across the entire PrEP cascade. Implementation models for PrEP delivery in non-traditional settings were assessed through the lens of the RE-AIM framework [15], which spans five domains: Reach, Effectiveness, Adoption, Implementation, and Maintenance, as represented in Table 1 below. We identified the most salient constructs and considered their implications for both PrEP (i.e., the intervention) and its delivery.

Emerging PrEP Delivery Models

Emerging PrEP delivery models have the potential to transform how HIV prevention services are accessed and utilized, particularly among populations that face barriers to traditional healthcare settings. These approaches include community-based distribution, pharmacy-based services, and telehealth platforms. By shifting PrEP delivery outside of conventional clinic environments, these models enhance accessibility, reduce stigma, and offer more convenient, culturally responsive options for individuals at risk of HIV. Community organizations, pharmacists, and digital health tools often play a central role in these strategies, facilitating education, adherence support, and follow-up care. As these models continue to evolve, they hold significant promise for expanding PrEP uptake and advancing more equitable HIV prevention efforts.

Home and Community-Based PrEP Delivery Models

Home and community-based PrEP delivery models involve delivering PrEP in community settings—such as through mobile clinics, outreach events, and courier delivery to homes—bringing services closer to where people live, work, and socialize. Studies implemented in diverse settings in South Africa, including schools, shebeens, and youth clubs, have demonstrated the utility of taking PrEP directly into communities. For example, the POWER study in Cape Town demonstrated that, among 26 adolescent girls and young women (AGYW) who were offered a variety of PrEP delivery platforms, mobile clinics were the most preferred platform ($n = 23$; 92.3%) followed by courier delivery ($n = 17$; 65.4%), a government clinic ($n = 9$; 34.6%), and a PrEP club ($n = 6$; 23.1%) [16]. Moreover, a shebeen-based outreach program in rural South Africa led 27% (37/136) of PrEP-eligible patrons to initiate PrEP, most of whom were men and many with hazardous drinking patterns [17]. Other successful outreach initiatives included school-based and salon-based programs targeting young people and women in urban South Africa [18, 19].

Beyond initial uptake, community-based PrEP delivery models also show promise in supporting persistence. In Namibia, among 1,953 AGYW who initiated PrEP, those who received individually tailored, community-based refills through a concierge model were nearly nine times more likely to persist with PrEP at one month compared to those using a hybrid community-clinic model (adjusted prevalence ratio = 8.70, 95% confidence interval [CI] 5.44–13.9) [20]. Further, a study in South Africa reported high initial uptake among AGYW accessing PrEP through co-located, community-based HIV testing sites, especially when same-day initiation was offered, and moderate short-term continuation (55% refilled within 90 days) [21]. Although models have yet to demonstrate sustained use, findings support the growing momentum toward differentiated, client-centered PrEP delivery that prioritizes flexibility, autonomy, and decentralized access, features particularly critical for navigating competing demands such as school, work, or caregiving over time.

Acceptability research has shown that home and community-based PrEP delivery offers many perceived advantages among users, including greater privacy, reduced stigma, and increased convenience. AGYW in Cape Town described how courier delivery allowed them to avoid unwanted disclosure and control their schedules [16]. These preferences are echoed in programs for male populations in South Africa where men in the Eastern Cape emphasized the need for PrEP delivery to be fast, convenient, and community-based, noting that clinic settings may pose a barrier [22]. In Mississippi (U.S.) and France, studies on mail delivery of

PrEP and remote consultations found high comfort levels among participants, who cited convenience and confidentiality as key benefits [23, 24]. Peer-led delivery models, such as those used in programs for sex workers in Zimbabwe and AGYW in Kenya, fostered trust, reduced stigma, and expanded access by offering PrEP in familiar, safe, community settings [25, 26].

Costs and scalability are critical for broader implementation of community-based PrEP delivery models. A study estimating the incremental costs of three types of community-based PrEP delivery paired with effective use counseling found that although initial costs were high due to low client volumes, modeled scale-up reduced per-client costs substantially, particularly for community-based PrEP dispensaries and group-based counseling delivered by lay providers [27]. Moreover, community pharmacy- and mail-based models in Mississippi and urban U.S. settings were found to be highly acceptable to patients and offered logistical advantages [23, 28], though successful implementation depends on robust systems for shipping, supply chains, and staffing. These results illustrate how community-based delivery can be optimized for efficiency and user experience. Additional evidence is needed to assess long-term sustainability, integration with existing health systems, and the feasibility of scaling community-based PrEP models across diverse settings.

Home and community-based PrEP delivery models offer promising alternatives to traditional clinic-based care. These community-anchored programs can potentially improve reach, reduce stigma, and facilitate trust. Studies across diverse settings, including schools, bars, salons, and community-based organizations, show that bringing PrEP closer to where people live and socialize can improve uptake and early persistence. When paired with telemedicine, peer support, or other client-centered services, these models promote autonomy, discretion, and convenience, which are especially important for individuals facing stigma or logistical barriers. As PrEP options diversify to include long-acting formulations, flexible and community-based platforms will be essential to ensuring user choice and equitable access.

Telemedicine PrEP and Online Platforms

Although telemedicine PrEP (telePrEP) and online delivery models, which provide PrEP remotely through telephone or video technology, are gaining prominence, evidence on their effectiveness for PrEP uptake, persistence, and adherence is limited. These models have been implemented among populations who face multilevel barriers to accessing PrEP and address prevalent barriers such as geographic distance, time, transportation, and stigma. Mostly, these models are embedded in community delivery models supported by peer

educators and social media. In Brazil, the U.S., and Malaysia, studies have integrated with other services such as HIV self-testing (HIVST) [23, 29, 30] and syringe programs among people who inject drugs [31].

TelePrEP models gained prominence in response to the COVID-19 pandemic, and results have been mixed. Studies in the U.S. and Brazil have successfully demonstrated how telehealth can sustain PrEP services during emergency pandemics. Implementation of telePrEP in the U.S. enabled sustained PrEP services during the COVID-19 pandemic without significant differences in demographics, engagement, or retention [32]. In Brazil, on the other hand, there was a reported 70% acceptability of PrEP teleconsultation among men who have sex with men (MSM) and transgender/non-binary individuals [30]. Electronic record analysis from three U.S. states also revealed a significant increase in the proportion of male PrEP visits during the pandemic compared to the pre-pandemic period, with the majority provided via telePrEP [33]. Healthcare workers' experience in Mexico indicated that telemedicine effectively mitigated COVID-19 exposure, facilitated users' access to PrEP, minimized waiting times, and enhanced healthcare professionals' perceived control during sessions [34].

Outside the COVID-19 pandemic, evidence on the acceptability and use of telehealth interventions for PrEP is limited. A usability and acceptability study in Malaysia (JomPrEP) found online PrEP to be a highly feasible and acceptable tool for MSM to access HIV prevention services quickly and conveniently, with almost all participants (46/50, 92%) initiating PrEP using the app and rating the app as having high acceptability [29]. Acceptability was also high when compared to in-person visits, as demonstrated among cisgender males in the US, with 56.3% reporting a strong preference for telemedicine [35]. Another study in the U.S. found that participants were most comfortable receiving PrEP via mail delivery, followed by telemedicine [23]. In the Combine! study across five Brazilian public clinics, among 470 PrEP users, 52% chose telehealth over in-person follow-up [39].

Uptake of PrEP via telemedicine and online platforms has increased initiation among populations who encounter stigma in clinic settings. Studies in the U.S., Brazil, and China, for example, have successfully engaged Latinx sexual minority men, men who have sex with men (MSM), and transgender/non-binary individuals [30, 33, 36, 37]. In the PrEPTECH trial in the U.S., a telehealth intervention significantly increased PrEP uptake among young MSM and transgender women, with 64.2% in the intervention arm reporting PrEP use at 90 days post-baseline (versus 27.3% in controls) and 75.4% by 180 days (36% in controls), corresponding to an odds ratio (OR) of 8.0 (95% CI 2.9–21.9) [38].

Data on PrEP continuation and adherence is also limited. In a study among MSM in China, retention was 82.4% at month 6 [37]. Adherence among those that continued PrEP in the PrEPTECH study was not significantly different between study arms [38]. In the Combine! study in Brazil, after an average follow-up period of 1.6 years, the risk of discontinuing PrEP (not having the medication for more than 90 days) was 34% lower with telehealth (adjusted hazard ratio= 0.66, 95% CI 0.45–0.97) [39]. Structural barriers to telehealth engagement (telephone/internet access) and limitations of the virtual care environment (difficulty establishing rapport) may impede efforts to promote and prescribe PrEP equitably. Expanding the PrEP outreach workforce and availing alternatives to telemedicine (e.g., community-based PrEP provision, specimen self-collection) could facilitate PrEP care continuity [40] especially as tele-PrEP and online require an optimal approach that involves a blend of face-to-face and virtual services [34]. For now, the best use case for telePrEP is integrating digital tools into community-based approaches to reach at risk populations and to promote adherence [24].

Pharmacy PrEP Models

The delivery of PrEP in community and private pharmacies is emerging as a promising PrEP implementation strategy and may help overcome barriers associated with PrEP delivery in traditional clinical settings, including HIV-related stigma, long wait times, and overcrowding. In the U.S., a willingness-to-screen survey found that 76% of 10,816 men were open to screening for PrEP in a pharmacy setting [41]. A cross-sectional study in San Francisco (U.S.) reported an increase in pharmacy-based PrEP use from 3% in 2021 to 8% in 2024 following policy changes that expanded pharmacist authority to prescribe PrEP [42]. Key challenges to pharmacy-led PrEP remain, including limited public awareness, staffing constraints, and inadequate reimbursement. Increasing advertising and developing standardized furnishing protocols could help address these barriers and improve access [42].

In Kenya, a single-arm prospective pilot evaluated the feasibility and effectiveness of delivering oral PrEP through private pharmacies, which were able to reach people at risk of acquiring HIV who are often missed in traditional settings, including men and individuals with multiple sexual partners or partners of unknown HIV status [43]. Pharmacies offered HIV self-testing, counseling, and PrEP dispensing with remote clinician support for complex cases, and initiation rates were comparable to or higher than those observed in public facilities: of 476 eligible clients, 287 (60%) initiated PrEP. The cost of services was approximately \$3 USD per visit, balancing affordability for clients and financial

sustainability for private pharmacy owners. Acceptability in the pilot was also high; nearly all clients ($\geq 96\%$) agreed or strongly agreed that the services were appropriate and convenient and reported reduced wait times compared to public clinics. A fidelity assessment of the pharmacy intervention found that nearly all clients received adherence counseling (99%) and side effects information (97%), and provider-assisted HIV self-testing was offered at both initiation and refill visits [44].

PrEP continuation in the Kenya pilot was 53% (153/287) at one month, 36% (103/287) at four months, and 21% (51/242) at seven months, with 21% of clients stopping and restarting PrEP during the observation period and overall pill coverage of 40% [43]. A U.S.-based mixed-method evaluation of a pharmacist-led model with clinic linkage among 120 cisgender MSM found that 18% linked into care within three months [45]. These findings suggest that pharmacy-based models are both feasible and acceptable, but further evidence is needed to demonstrate initiation and continuation in diverse settings.

Automated and Remote PrEP Dispensing

Our search produced limited results on the implementation of automated and remote dispensing of PrEP, which refers to the use of vending machines, smart lockers, or digital platforms to distribute medications with minimal or no in-person interaction. However, a discrete choice experiment in South Africa found that individuals accessing primary healthcare services were 43% more likely to prefer collecting oral PrEP from vending machines over their original clinic (adjusted OR = 1.43, 95% CI 1.02–1.99), although pharmacies (5.02, 3.45–7.31) and home delivery (2.18, 1.26–3.78) were more strongly preferred [46]. In China, an online survey among MSM revealed that 46.3% preferred accessing PrEP through pharmacies, internet pharmacies, or vending machines, compared to just 15.6% who preferred traditional healthcare settings [47]. China's "HIV PrEP Mode Exploration Project," piloted in 24 cities, introduced vending machines that incorporated QR registration, remote telemedicine consultations, and pharmacist support [48]. Similar platforms have been proposed for newer products like the vaginal ring [49].

Outside of PrEP, similar automated models have been applied in broader healthcare contexts. South Africa's Central Chronic Medicines Dispensing and Distribution (CCMDD) program allows some individuals with stable chronic conditions, including HIV, to collect their medications from smart lockers using a PIN at no cost with the aim of reducing clinic congestion [50]. In other settings such as the U.S., the UK, and China, vending machines and pharmacy kiosks have been used to distribute a range of health

products, including condoms [51], HIV/STI testing kits [52–54], sterile injection equipment for people who inject drugs [55, 56], COVID-19 test kits [57], and over the counter medication including emergency contraception [58, 59], and naloxone [60–65]. Reported benefits include round-the-clock availability, reduced wait times, and greater confidentiality, which can be particularly important for populations who may experience stigma in clinic environments [52]. Furthermore, vending machines may provide cost benefits to individuals by reducing transportation expenses and minimizing unnecessary visits to healthcare providers [66].

Despite these advantages, implementation barriers remain. Concerns include privacy when machines are located in public spaces, distrust in machine reliability, and technical issues such as power requirements, vandalism, or lack of internet connectivity [56, 60]. Regulatory restrictions may limit the dispensing of prescription medications like PrEP, which often require routine HIV testing and provider oversight [49]. Automated dispensing also typically offers limited integration with broader care services. Proposed solutions include bundling products to increase utility, providing secure multi-use access cards, and placing machines in semi-private community settings [67].

PrEP Implementation Programs in South Africa

South Africa has pioneered innovative non-clinic models to expand PrEP access for populations underserved by traditional healthcare facilities. In addition to research, several ongoing implementation and demonstration projects—led by our team and partners—are actively testing the feasibility and scalability of differentiated PrEP delivery in real-world settings. Below, we highlight a few of these initiatives, which prioritize PrEP decentralization and integration with existing social structure.

FastPrEP is an implementation program designed to enhance uptake and optimal utilization of oral and novel PrEP modalities among adolescents and young people in Cape Town through differentiated service delivery. The program's hub-and-spoke model uses local government and community-based mobile clinics as designated "hubs" for PrEP initiation and alternative outlets, or "spoke"s, including schools, couriers, and youth clubs, that clients can leverage for PrEP maintenance [16]. This approach allows clients, with support from peer navigators, to select the PrEP product and delivery channel that best align with their needs and lifestyles [16]. Launched in August 2022, the program aims to enrolled 25,000 youth in PrEP services [68].

The Aurum Institute has integrated an e-pharmacy option for PrEP continuation among clients utilizing their community-based POP INN clinics targeting MSM and transgender women (TGW) in Johannesburg. MSM and TGW

conduct an HIV self-test and upload their test results onto a mobile application. This innovative system enables clients to engage with telehealth services from any location in South Africa, thereby eliminating the need for clinic visits. Between April 2022 to December 2023, 813 clients were enrolled in the e-pharmacy program [69].

PPrEPP-SA is an implementation science project designed to expand oral and novel PrEP options utilizing community pharmacies and an end-to-end online platform for initiation and maintenance. The project collaborates with two of the largest corporate pharmacy chains, the largest organization representing independent community pharmacies, and a unique online platform offering health and wellness products. The project provides clients oral PrEP and the dapivirine vaginal ring. Implementation in community pharmacies is underway in Gauteng and Western Cape province with the online pilot limited to Gauteng residents. Between July 2023 to January 2024, 653 men and women at risk of HIV acquisition initiated PrEP through the pharmacies [70] and 53 through the online platform [71].

Regulatory and Policy Considerations

Decentralizing PrEP provision requires navigating complex regulatory and policy frameworks to ensure access, safety, and legal compliance. The WHO endorses task shifting to expand PrEP services, and all models discussed above incorporate this principle. However, delivery remains highly medicalized in many countries, limiting who can prescribe PrEP and how it can be dispensed. In South Africa, nurses in the public sector may initiate and dispense PrEP upon completing the Nurse-Initiated Management of Antiretroviral Therapy (NIMART) course and receiving formal authorization. Namibia has adopted similar guidelines [70] (Barnabee et al., 2022), supporting the rollout of community-based models. The Kenyan study has demonstrated that private pharmacists can prescribe PrEP independently [71], and in the U.S., certain states have authorized pharmacists to prescribe PrEP under collaborative practice agreements or limited supply (60 days) [72]. In October 2025, South African pharmacists were authorized to prescribe PrEP independently through the Pharmacy-Initiated Management of Antiretroviral Therapy (PIMART) program. Emerging automated and remote models, such as smart lockers and vending machines, also face regulatory hurdles and may require hybrid approaches for client initiation and continuation. To ensure clinical oversight and compliance to the appropriate screening procedures (e.g., HIV testing, renal function monitoring), remote models are often implemented as hybrids, combining in-person visits with telemedicine-support. In

some cases, these models are integrated into community or peer-led programs with clinical oversight provided via telemedicine consistent with regulatory requirements [25, 36]. As new delivery strategies evolve, continued policy innovation will be essential to safely and sustainably scale PrEP access beyond traditional healthcare facilities.

Future Directions and Research Gaps

Although emerging evidence from diverse settings highlights the promise of decentralized PrEP delivery, most research has focused on early reach and acceptability rather than long-term effectiveness, implementation, or maintenance. Although some models have demonstrated client uptake and acceptability, they have not been rigorously evaluated for efficacy, cost, scalability, or health system integration. Hybrid delivery approaches that combine telemedicine, HIV self-testing, courier distribution, and community-based support offer potential to enhance flexibility and autonomy, but they remain largely in the pilot or demonstration phase of development. In the context of shrinking global HIV budgets, there is an urgent need for implementation research that moves beyond pilot testing to assess effectiveness, cost-effectiveness, system integration, and sustainability at scale. Without such investment, promising innovations risk remaining isolated and failing to achieve broader public health impact. Future research should prioritize pragmatic trials and long-term evaluations that strengthen the evidence base across all RE-AIM dimensions, focusing on adoption, cost, and maintenance in real-world settings.

Conclusions

Our review synthesizes the promising body of evidence on decentralized PrEP delivery, highlighting models such as home delivery, pharmacy-based distribution, and online prescribing. By focusing on models that extend beyond traditional clinics, our work offers an updated view of emerging strategies that aim to increase PrEP accessibility and use among vulnerable populations globally. Expanding PrEP delivery outside of clinics could help address persistent gaps in uptake, persistence, and equity. Our findings underscore the need for further research on the implementation, effectiveness, cost, and long-term sustainability of decentralized models to inform policy and programmatic shifts that support broader, more inclusive PrEP access. Strengthening evidence across these domains will be essential to achieving durable, scalable expansion of PrEP delivery beyond traditional clinic settings.

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