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Multi-level Interventions to Promote Oral Pre-exposure Prophylaxis Use Among Adolescent Girls and Young Women: a Review of Recent Research

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Abstract

Purpose of review This review summarizes interventions to promote HIV pre-exposure prophylaxis (PrEP) use among adolescent girls and young women (AGYW) in HIV endemic settings, while also highlighting gaps in our current measures of PrEP intervention success.

Recent findings AGYW report challenges with PrEP use, although the field is currently grappling with defining metrics of optimal PrEP use applicable for AGYW with dynamic HIV prevention needs. Ongoing studies are exploring multilevel interventions to address barriers to PrEP use for AGYW. At the individual and interpersonal levels, mHealth, drug-level feedback, adherence counseling, peer groups, and PrEP decision-support interventions are acceptable and feasible for AGYW although limited effectiveness data are available. At the health facility and community levels, PrEP demand creation, modified PrEP refill schedules, and integrated PrEP and reproductive health services are also promising options to support PrEP use for AGYW.

Summary As PrEP delivery continues to expand, improved metrics of success and evidence on the effectiveness of multi-level adherence support interventions are needed to maximize the impact of PrEP for AGYW in HIV endemic settings. We present case studies of these intervention approaches but limited data are currently available on the effectiveness of these approaches. We will look toward forthcoming study results on the impact of PrEP interventions, including mHealth, drug-level feedback and other enhanced counseling, peer support, decision-support tools, PrEP demand creation, modified refills, and integrated service delivery, to determine the ideal package of PrEP support approaches for AGYW.

Keywords Pre-exposure prophylaxis · Adherence · Uptake · Prevention-effective use · Adolescent girls and young women · HIV prevention

Introduction

Adolescent girls and young women (AGYW), ages 16–25 years, face alarmingly high rates of HIV, with recent trials reporting HIV incidence estimates as high as 7 per 100 person-years in this group [1, 2•, 3]. As a result, AGYW are a priority population for effective HIV prevention options, including oral pre-exposure prophylaxis (PrEP). The World Health Organization recommends oral PrEP for AGYW and approximately 120 countries have included PrEP recommendations in their national guidelines [4]. Randomized controlled trials found that oral PrEP is > 90% effective at preventing HIV when taken with high adherence during periods of risk [5–8]. Demonstration projects with adolescents and young adults report high initial uptake of PrEP in real-world delivery settings [9, 10, 11••, 12, 13]. However, despite its effectiveness, some AGYW have difficulty adhering to PrEP and sustaining continued PrEP use, limiting its impact as a biomedical HIV prevention tool [14•].

Recent PrEP programs with AGYW report declining adherence over the first 6 months to 1 year of use, due to a range of individual, interpersonal, and contextual factors

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[11••, 12, 13, 14•, 15••, 16]. Commonly reported barriers to PrEP use in this population include lack of social support, stigma and discrimination related to sexual behavior and PrEP use, gender-based violence (GBV), PrEP side effects, forgetting pill dosing and lack of habit formation around use, disclosure concerns, and depressive symptoms [13, 17–20]. Judgmental or stigmatizing interactions with health care staff, fears of provider judgmental, long clinic wait times, and inconvenient clinic opening hours and visit schedules also may impact PrEP uptake and refills [13, 16, 21].

Successful PrEP delivery for AGYW will require a range of PrEP support interventions that address these complex, multi-level challenges to regular PrEP use during periods of HIV risk. This review will summarize current evidence on PrEP support interventions for AGYW, with a particular focus on recent interventions to address individual, interpersonal, and contextual barriers to PrEP use.

Text of Review

Defining Metrics of PrEP Success to Improve PrEP Delivery Targets for AGYW

PrEP programs are currently seeking to identify effective interventions to maximize PrEP use among AGYW in HIV endemic settings, but they are simultaneously grappling with definitions around what it means to achieve "successful" oral PrEP use for this population. PrEP outcome measures have closely resembled metrics for antiretroviral therapy (ART) adherence, which do not adequately reflect the intention for PrEP to be used only during periods of HIV risk rather than as a lifelong treatment approach [22••]. Going forward, there is a need to move toward evaluating PrEP support approaches based on whether they promote alignment between PrEP dosing and dynamic changes in sexual behavior and HIV prevention needs among AGYW [23]. In this section, we present different perspectives on existing metrics of "PrEP success" to inform our findings and conclusions about effective PrEP support interventions presented elsewhere in the review.

PrEP uptake is a key outcome for PrEP trials and delivery programs among AGYW [22••, 24, 25]. Uptake is typically measured by receipt of a PrEP pill bottle or PrEP prescription. At subsequent clinic visits, PrEP adherence is generally assessed using a variety of self-report, electronic, and pharmacologic measures, including validated adherence questionnaires, pill counts, electronic pill containers, and plasma, dried blood spot, plasma blood mononuclear cell, hair, and urine laboratory or point-of-care assays [26•, 27]. PrEP persistence and continuation are often defined by pill pick-ups, visit retention, and adherence metrics assessed over a sustained period of time. While there is a range of measurement options for each of these PrEP outcomes, the numerators and denominators of these metrics are poorly defined and often differ by setting and population, limiting their comparability [22••]. For example, AGYW are deemed eligible for PrEP if they are "at substantial risk of HIV", which is based on a range of factors including regional HIV incidence and prevalence estimates, individual sexual behaviors, alcohol or substance use, GBV victimization, demographic factors including age, and any incident sexually transmitted infections (STIs) [24, 28]. Metrics of PrEP adherence, persistence, and continuation often do not account for changing HIV risk and need for PrEP over time in populations of AGYW.

PrEP demonstration and implementation projects with AGYW are currently exploring new measures of success for programmatic PrEP delivery. A recently published "intervention-centric cascade" outlines guidance for metrics for: (1) PrEP coverage (which incorporates statistics for the target population of AGYW, PrEP availability, uptake of PrEP screening, oral PrEP eligibility based on local guidelines, and oral PrEP offering, along with PrEP initiation and continuation); (2) PrEP update (inclusive of statistics on both PrEP offering and PrEP initiation); and (3) PrEP adherence (inclusive of statistics on PrEP initiation, PrEP continuation, and PrEP discontinuation) [22••]. PrEP restarts are also an important component of programmatic PrEP delivery and are a key success metric for AGYW with changing PrEP needs. The DREAMS, POWER, and Partners Scale-Up PrEP programs provide important examples of approaches to operationalize these new metrics of PrEP delivery for AGYW [29••, 30••]. They have emphasized the concept of PrEP restarts to describe AGYW cycling on and off PrEP as a metric of success in this population.

Recent work has also been done to redefine metrics of PrEP adherence, recognizing that traditional measures of adherence that do not account for dynamic HIV prevention needs often fail to capture successful PrEP use for AGYW accurately. PrEP is most cost-effective when its use is aligned with periods of HIV risk — a concept defined as "prevention-effective adherence" [31•, 32]. Studies exploring prevention-effective adherence among AGYW have found that young women define their HIV risk based on various factors, including trust in a relationship and relationship dynamics, sexual behavior (e.g., number of sexual partners, transactional sex, condom use), pregnancy, and STI symptoms or diagnosis [15••, 31•, 33, 34•]. Analyses seeking to understand prevention-effective PrEP use (by using a combination of information on sexual behavior, HIV risk perceptions, and biomarkers of sexual activity and PrEP use) have found that AGYW can align their PrEP use with periods of HIV risk in a variety of settings [15••, 31•, 33, 34•]. In addition, a cohort of AGYW using PrEP in South Africa and Zimbabwe reported low levels of PrEP continuation and

PrEP adherence based on pharmacological samples but also found significantly lower than expected rates of HIV incidence [15••]. STI diagnoses were generally high (30–40% of AGYW had STI diagnoses at enrollment) in this cohort, indicating some HIV risk, and supporting the effectiveness of PrEP dosing around periods of HIV risk to reduce incident HIV infections [15••]. PrEP programs could support prevention-effective PrEP use among AGYW by counseling clients to recognize drivers of HIV risk and modulate PrEP use accordingly. This body of research also points to a need for defining successful PrEP adherence based on a prevention-effectiveness model which may be effective for AGYW while also reducing cost, personnel, and time burdens on healthcare systems in HIV endemic settings.

Individual and Interpersonal Interventions to Support PrEP Use for AGYW

The context of PrEP measurement provides important background for our consideration of recent efforts to improve PrEP use among AGYW. Individual- and interpersonal-level interventions seek to address various barriers to PrEP use, including internalized, perceived, and experienced stigma around PrEP use, knowledge about PrEP pill taking, habit formation around PrEP dosing, and disclosure concerns. These interventions include: (1) mobile health ("mHealth") approaches; (2) counseling based on levels of PrEP detected in pharmacologic samples ("drug-level feedback counseling"); (3) counseling focused on these PrEP barriers using problem-solving, cognitive-behavioral, and motivational interviewing approaches; (4) peer support groups and adherence clubs; and (5) decision tools to facilitate decision-making around PrEP use (Table 1). The five intervention types seek to improve PrEP outcomes through increased PrEP knowledge, self-efficacy, behavioral skills for daily pill taking, social support, and youth-friendly communication between healthcare providers and clients. There is currently limited evidence on the effectiveness of these approaches on modifying PrEP uptake and adherence (defined as drug use over a period of time, rather than prevention-effective PrEP use) but we present a state of the current science and point to areas of ongoing research.

mHealth interventions

Several PrEP projects are currently assessing the use of mobile and wireless technologies such as text messaging, WhatsApp and other smartphone applications as a mechanism to support PrEP uptake, adherence and continuation while leveraging the high levels of mobile phone and social media use among AGYW. Currently, mHealth interventions to support PrEP use include one-way and two-way SMS messaging to remind AGYW to take PrEP and to facilitate real-time communication between health providers and

Table 1 Summary of current findings on individual- and interpersonal-level interventions to support effective PrEP use

Intervention	Study	Key findings	Potential barriers to delivery
mHealth	HPTN 082	SMS were acceptable	SMS fatigue, smartphone access, phone data
	MPYA	SMS reminders were ineffective in promoting PrEP adherence	
	PrEP SMART	Ongoing study	
	POWER	SMS was motivating and helped participants remember clinic visits	
Drug-level feedback	HPTN 082	Drug-level feedback counseling was not effective in increasing PrEP adherence	Drug-level feedback can be costly and logistically challenging
	PrEP SMART	Ongoing study	
Adherence counseling	EMPOWER	GBV screening and counseling acceptable and feasible	Drop-offs in retention for clinic visits, provider training and time for counseling delivery
	PrEP SMART	Ongoing study	
Peer groups	EMPOWER	Peer based club did not enhance PrEP adherence; clubs were acceptable, valuable for sharing tips on managing side effects	AGYW have busy schedules led to poor attendance of the clubs
	HPTN 082	Monthly adherence clubs acceptable. Approximately 70% AGYW enrolled in the trial attended at least one adherence club at three months of PrEP use	
Decision support tool	POWER	AGYW who had access to the tool had 20% continuation, compared to 11% in the other website, resulting in 1.97 times the odds of PrEP continuation at month 1 than those in usual care	Limited time for completing the decision tool, smartphone access, phone data

PrEP users, as well as virtual social support groups. Recent evidence has found that mHealth interventions are a highly acceptable strategy to support PrEP use [35•, 36••]. SMS reminder messages could potentially help AGYW develop adherence habits and provide a sense of connection and support with clinic staff [35•, 36••, 37]. Two-way or bidirectional SMS messages also enable new PrEP users to communicate with a remote provider, ask PrEP-related questions, and address concerns around pill-taking and side effects that may not have been answered during a clinic visit.

While SMS interventions are acceptable for young women using PrEP and have been found to effectively support ART adherence among women, they have not been found to effectively improve PrEP adherence among AGYW, where adherence is defined using electronic monitoring devices capturing dosing over a prolonged period of time. In a recent trial of SMS reminder messages among Kenyan AGYW, the SMS intervention did not significantly improve PrEP adherence in the context of generally low PrEP use across a 24-month follow-up period [36••]. PrEP demonstration projects have consistently shown a decline in PrEP use through the first 3–6 months after PrEP initiation [9, 10, 12, 38••, 39, 40], and it is possible that SMS interventions have a limited impact on PrEP use in part because of drop-offs in PrEP adherence (and AGYW needs for PrEP) in both intervention and standard-of-care arms. In addition, participants may experience SMS fatigue over a long study period. Ideally, SMS interventions could be used to support early PrEP habit-formation, adherence, and continuation particularly over the first 3 months of use or during a time when an AGYW is resuming PrEP use after a break, but more research is needed to understand the optimal approach for a youth-friendly, SMS intervention. Cost of these SMS programs will also need to be considered prior to implementing such services if they are found to be effective for AGYW. A recent study evaluating one-way and two-way SMS interventions for ART adherence in Kenya found that one-way SMS costs approximately $2542 and two-way SMS costs approximately $3725 per facility and 115 individuals reached [41]. Personnel and software development comprised the majority of these costs [41]. Other work using SMS for voluntary medical male circumcision in Zimbabwe found that while two-way SMS had a high upfront cost and other costs associated with maintenance, it could successfully reduce clinic visit and outreach costs [41, 42]. Similar budget impact and cost-effectiveness analyses are needed to consider the scalability of SMS PrEP support approaches for AGYW.

In addition to these SMS approaches, PrEP delivery programs could also leverage rapidly evolving mobile phone technologies to create PrEP support interventions as smartphone applications. WhatsApp is a commonly used chat platform among AGYW globally and can facilitate virtual discussions around PrEP pill-taking and HIV prevention behaviors. WhatsApp groups have the potential to overcome logistical barriers of in-person clinic visits and currently the "PrEP SMART" study in South Africa is investigating the effect of a two-way SMS intervention compared with WhatsApp groups on PrEP adherence and persistence among AGYW (clinicaltrials.gov; NCT04038060).

Drug-Level Feedback Interventions

In early PrEP efficacy trials, young women expressed desires to learn more about levels of PrEP in their bodies to motivate regular pill-taking behavior and instill confidence that PrEP was "working" for them [19, 43]. More recent PrEP studies have sought to estimate the effectiveness of "drug-level feedback counseling", where individuals are counseled about the levels of PrEP detected in their blood or urine, on PrEP adherence and continuation. The HPTN 082 study randomized AGYW in South Africa and Zimbabwe to receive either drug-level feedback counseling or standard counseling and did not detect a significant intervention effect on PrEP adherence, defined using dried blood spot data after a year of follow-up [15••, 40]. However, overall HIV incidence rates were low in the cohort and high drop-offs in PrEP adherence were observed in both arms. The "3P" open-label study (Partners, Perceptions, and Pills) found that drug-level feedback effectively supports PrEP habit formation, although the extent to which it impacted PrEP adherence remains unclear as feedback was combined with PrEP adherence counseling in this program [44••]. Nonetheless, findings show that drug-level feedback counseling is highly acceptable for AGYW [15••, 40, 44••].

Drug-level feedback counseling is challenging to implement in resource-constrained settings. The 3P and HPTN 082 studies delivered counseling messages based on PrEP drug levels from dried blood spot (DBS) samples. However, DBS can be expensive to process, can result in logistical challenges and delays in receiving results, and reflects a long window of PrEP pill-taking which does not allow counselors to provide targeted, real-time feedback about recent PrEP use. The "PrEP SMART" study is currently exploring whether a urine point-of-care test is an acceptable means of delivering drug-level feedback counseling to AGYW with more real-time results and lower logistical and cost burden than DBS. Findings from this work, expected in 2022, will inform future drug-level feedback counseling options for young women.

PrEP Adherence Counseling Interventions

Adherence counseling at PrEP initiation and refill visits is essential for promoting informed PrEP decisions and PrEP continuation and persistence among AGYW. Ongoing PrEP

studies are exploring individually, tailored adherence counseling, using strategies such as cognitive behavioral therapy, motivational interviewing, and problem-solving to overcome barriers to PrEP use for AGYW (e.g., PrEP SMART). The EMPOWER study assessed the combination of GBV and PrEP adherence counseling as it is hypothesized that GBV experiences may serve as a barrier to PrEP use. Findings from this study showed that GBV screening and counseling was acceptable and feasible for implementation with PrEP counseling [45].

Peer Support Groups

Adolescence is a critical time of social network development and strengthening and peer support groups provide an important platform for AGYW to share PrEP taking experiences and offer tips and advice. In EMPOWER, peer-based empowerment clubs did not enhance PrEP adherence [46]. However, the qualitative findings show that they are acceptable, enable users to share tips and tricks to overcome side effects, build a social network [47•]. Similarly, in HPTN 082 trial, PrEP adherence clubs were acceptable among AGYW taking PrEP. Approximately 70% of AGYW enrolled in the trial attended at least one adherence club at 3 months of PrEP use [16]. Implementation of in-person support clubs may be challenging in contexts where there may be lower social cohesion and AGYW can have difficulty attending groups because of busy schedules and competing activities. Current PrEP programs are exploring virtual PrEP adherence groups via WhatsApp as an alternative means to facilitate peer support.

PrEP Decision Support Tools

PrEP decision tools, delivered via mobile platforms, offer another recent innovation that has shown potential to enhance PrEP uptake and adherence in AGYW. The tools are used to provide PrEP information and risk perception assessment. They are particularly useful in instances where there is limited time to educate patients in busy clinics and limited experience of providers with patient-centered counseling and can overcome provider barriers to delivery, especially in resource-limited settings. They also have the potential to improve PrEP use by addressing knowledge about HIV risk and risk perceptions and can help with PrEP decision-making among AGYW who feel hesitant to initiate discussions about PrEP with providers due to concerns about providers' judgmental attitudes and stigma. Recent evidence on the "MyPrEP" phone-based decision tool found that the tool is associated with increased PrEP persistence. AGYW who had access to the tool had 20% continuation, compared to 11% in the other website, resulting in 1.97 times the odds of PrEP continuation at month 1 than those in usual care (conference abstract in process). More studies are underway assessing the effect of PrEP decision tools, integrated with decision support messaging around oral PrEP and injectables.

Community and Health Systems Interventions to Promote Youth-Friendly PrEP Delivery

Although individual and interpersonal levels are critical to address individual-level barriers to PrEP use, there is also a need for community and health systems-level interventions to promote PrEP use for AGYW. Making PrEP acceptable to a broader community, easily accessible to young people, and delivered in environments that are youth-friendly and welcoming is a priority for programs. Recent research has sought to promote successful PrEP delivery and use among AGYW through: (1) adolescent-friendly PrEP demand creation in communities and clinics; (2) modified PrEP refill and visit schedules; and (3) community-based and de-medicalized PrEP delivery approaches and PrEP delivery integrated with other services for gender-based violence, mental health, and sexual and reproductive health (Table 2).

Adolescent-Friendly PrEP Demand Creation: Best Approaches to Deliver PrEP Information

PrEP awareness and demand creation among AGYW is key to facilitate uptake and effective use. PrEP messages that are simple and motivate young women to consider their HIV risk while also appealing to their emotions and aspirations may be effective for this population. HIV prevention messages can be delivered through community avenues that are attractive and easily accessible by youth, including radio, television, and social media platforms [48•, 49]. For example, in the "3P" (Partners, Perceptions, and Pills) HIV prevention study conducted among AGYW in South Africa, a 90-s video showcasing youth seeking PrEP from an empowerment lens was highly acceptable and generated excitement among AGYW [50•]. The project found high interest in PrEP among participants who viewed the video.

It is also critical to ensure the broader community in which AGYW are situated is aware of and accepting of young people using PrEP, given that decisions about PrEP uptake and continuation are often motivated by peers, sexual partners, family members, and the community [25]. AGYW are particularly motivated to take PrEP effectively when they hear about it from others like them. HIV treatment studies have found that peer support interventions can successfully improve AGYW engagement in HIV care services including adherence to daily pill-taking for HIV treatment [51]. For a recent PrEP program in Kenya, the use of peer providers to promote PrEP awareness was associated with increased

Table 2 Summary of current findings on community and health systems interventions to promote youth-friendly PrEP delivery

Intervention type	Study	Country	Key findings
Adolescent-friendly PrEP demand creation	3P	South Africa	A PrEP video developed for demand creation was accepted by AGYW and generated high demand for PrEP
	Jilinde Project	Kenya	Over a 2-year period trained youth peer providers (YPP) reached 30,713 AGYW with PrEP messages compared to 8853 reached by community health volunteers
	HPTN 082	South Africa, Zimbabwe	There was high acceptability for adherence clubs with 70% of enrolled AGYW attending at least one adherence club at 3 months of PrEP use
	PrIYA	Kenya	Qualitative interviews with women using PrEP in pregnancy identified health providers as facilitators of PrEP use who could explain PrEP to male partners on behalf of pregnant women
Modified PrEP refill and visit schedules	PlusPills	South Africa	PrEP usage decreased and adherence among adolescents diminished when visits became less frequent
Community-based, de-medicalized, and integrated PrEP delivery approaches	POWER	Kenya, South Africa	PrEP services for AGYW are offered at family planning clinics, youth friendly clinics, and mobile youth friendly clinics with high uptake across these sites

PrEP uptake among AGYW [52]. However, the role of peers in promoting PrEP continuation has yet to be established. Another peer-based PrEP support approach, "*PrEP My Way*", is currently under study in Kisumu, Kenya, and uses peers to educate AGYW and deliver PrEP medication (clinicaltrials.gov: NCT04408729). Results are expected in 2023.

Healthcare providers also have an important role in delivering PrEP messaging and supporting PrEP use among AGYW within health facilities. Young PrEP users report increased motivation to adhere to PrEP when providers engage with them in a youth-friendly way, call them to check in on how they are, and send reminder messages about upcoming clinic visits [53•]. In Kenya, young pregnant women taking part in the PrIYA study reported that providers also facilitated their PrEP use by helping to explain PrEP to their male partners and family members [54]. It is necessary that service delivery environments are non-judgmental and supportive for AGYW and prior studies have found that health provider training can effectively address biases and improve quality of care, which could in turn promote care uptake and engagement among young people [21, 55].

Modified PrEP Refill and Visit Schedules

The World Health Organization recommends that individuals on PrEP return to clinic for a scheduled visit 1 month after PrEP initiation and then receive HIV testing and refills every 3 months thereafter [56]. Countries throughout Africa, where AGYW comprise a disproportionate burden of incident HIV infections, have adopted and implemented this recommendation [28]. However, data suggest that quarterly clinic visits may not work well for some AGYW. A recent study conducted among AGYW in South Africa observed a reduction in PrEP continuation when medication refill visits changed from monthly to quarterly [12]. This finding suggests that AGYW may benefit from more frequent clinic visits to address dynamic changes in their routines and HIV prevention needs. For those who cannot physically come to a clinic regularly, interactions with healthcare providers could take place by phone, text message, or WhatsApp and the COVID-19 pandemic has provided a unique opportunity to explore the acceptability and feasibility of telemedicine PrEP support approaches for AGYW [57••, 58].

Community-based, De-medicalized, and Integrated PrEP Delivery Approaches

Siloes in the healthcare delivery system can prevent AGYW from receiving PrEP alongside other medical services. AGYW commonly present to public facilities to receive sexual and reproductive health services [29••]. Therefore, establishing PrEP delivery within antenatal, postnatal, and family planning clinics has the potential to increase PrEP access and foster effective PrEP use among AGYW [30••, 59•, 60]. Doing so also promotes a holistic approach to addressing the healthcare needs of AGYW. Ongoing work is also exploring approaches to integrate PrEP delivery with sexually transmitted infection testing and treatment and mental health service delivery.

Delivery of PrEP services outside of clinical settings is also a promising approach to foster effective PrEP use among young women. Recent PrEP projects have been exploring the use of mobile vans and community-based venues for PrEP delivery. For example, the ongoing Prevention

Options for Women Evaluation Research (POWER) study is offering PrEP services out of mobile, youth-friendly clinics in South Africa and has demonstrated high PrEP uptake in this setting (clinicaltrials.gov; NCT03490058). Similarly, the DREAMS initiative, which operates in several African countries, is currently providing PrEP in a package of comprehensive, integrated services out of safe spaces within communities. Community pharmacies delivery healthcare services in a relatively anonymous and convenient manner and may also be attractive venues for PrEP delivery to AGYW. Pharmacy-based PrEP delivery programs have successfully improved PrEP accessibility for at-risk individuals in developed countries and could be adapted for the African context as well [61•, 62]. We expect results on the impact of these integrated, de-medicalized PrEP delivery approaches over the next few years. The studies highlighted here have been predominantly conducted with AGYW in South Africa and Kenya and we also look forward to the broader application of these PrEP delivery approaches to AGYW in other settings.

Conclusion

Recent advances in oral PrEP delivery for AGYW include an exciting variety of individual-, interpersonal-, health systems-, and community-level interventions, being tested and rolled out in the context of redefined metrics for success. While the interventions highlighted here have shown promise as acceptable and feasible for delivery with AGYW, limited data on the effectiveness of these interventions in promoting PrEP uptake, prevention-effective adherence, and continuation during periods of HIV risk are currently available. The research landscape is rapidly evolving and we look forward to forthcoming findings from the next generation of PrEP support interventions and long-acting HIV prevention options for AGYW [63•]. Moreover, these approaches are not one-size-fits-all, for the individual, the health system, or the cultural context, and choice of these intervention approaches will depend on the population's needs and setting. Tailored, multi-level PrEP support approaches are critical to maximize the public health benefit of PrEP and reduce the burden of HIV among AGYW in HIV endemic settings.

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