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Service delivery models that promote linkages to PrEP for adolescent girls and young women and men in sub-Saharan Africa: A scoping review

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Title

Service delivery models that promote linkages to PrEP for adolescent girls and young women and men in sub-Saharan Africa: A scoping review

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Abstract

Objectives: To synthesize and appraise the effectiveness and feasibility of pre-exposure prophylaxis (PrEP) service delivery models (SDMs) designed to promote linkage to PrEP care among AGYW and men in sub-Saharan Africa. The objectives were to a) summarize SDMs that promote PrEP initiation and b) explore users' perceptions, and barriers to, and facilitators of these models.

Search Strategy: This scoping review follows the methodology outlined in the Joanna Briggs Institute reviewers' manual. PubMed, Cochrane library, Scopus, Web of Science, and online-conference abstract archives were searched. We included quantitative and qualitative studies that described process outcomes (i.e., linkage to PrEP care) and barriers, facilitators, and user perceptions of PrEP SDMs.

Results: Of the 1204 identified records, 37 (27 studies and 10 conference abstracts) met the inclusion criteria. Health facility-based (HF-B) integrated models of PrEP delivery with family planning, maternal and child health (MCH) or sexual and reproductive services to AGYW resulted in PrEP initiation of 16-90%. Community-based drop-in centres (66%) was the preferred PrEP outlet for AGYW compared to public clinics (25%) and private clinics (9%). Most men preferred community-based delivery models. Among individuals who initiated PrEP, 50% were men, 62% were <35 years old and 97% were tested at health fairs compared to home testing. Integrated ART-PrEP delivery was favoured among serodiscordant couples with 82.9% of couples using PrEP or ART with no HIV seroconversions. PrEP uptake within healthcare facilities was increased by perceived client-friendly services and non-judgmental healthcare workers. Barriers to PrEP uptake included distance to travel to and time spent at health facilities and perceived community stigma.

Conclusion: PrEP SDMs for AGYW and men need to be tailored to the needs and preferences for each group. PrEP programme implementers should promote community-based SDMs to increase PrEP initiation among AGYW and men.

Key words: Pre-exposure prophylaxis, PrEP, linkage, adolescent girls, and young women, AGYW, men, sub-Saharan Africa

Strengths and limitations of this study

- A comprehensive search strategy was developed, and the search was carried out across multiple databases and conference archives.
- The methodology used in the scoping review was robust and included double data screening, extraction and synthesis.
- All included studies underwent critical appraisal of sources of evidence using approved tools.
- Studies not conducted in SSA and that were published in non-English languages were excluded.
- Most of the included studies were from Kenya, Uganda, and South Africa limiting the generalizability of the results.

Background

Recent reports indicate a decline in new HIV infections globally. However, this decline is occurring at a slower pace in regions with generalized HIV epidemics such as sub-Saharan Africa (SSA). In 2017, SSA accounted for 64% of new HIV infections globally.¹ Two underserved populations that are critical to drive the decline in new HIV infections are adolescent girls and young women (AGYW; 15-24 years) and men (25-65 years). AGYW are at substantial risk for HIV-infection with an estimated 310 000 new infections globally in 2018 – 86% of which was in SSA.¹ Men, on the other hand, account for more AIDS-related deaths globally than women – 400 000 deaths in men in 2018 compared to 270 000 in woman.¹

For differing reasons, AGYW and men show lower health seeking behaviour because of interpersonal and structural factors. AGYW's access to health services is limited by stigma, negative attitudes from healthcare workers and inconvenient clinic operating hours.² However, 'man unfriendly clinics' are characterised by inaccessible clinic hours/locations, difficulty in engaging with female staff, and gender norms that discourage men from accessing health services.^{3,4}

Amongst the 2020 Global Prevention Targets and Commitments is the reduction in the number of AGYW newly infected with HIV globally to below 100 000, and to ensure that 3 million people at substantial risk of contracting HIV have access to pre-exposure prophylaxis (PrEP).⁵ To achieve these targets, primary prevention programmes should be structured around five central pillars: (1) combination prevention for AGYW; (2) combination prevention with key populations; (3) voluntary medical male circumcision (VMMC) and sexual and

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3 reproductive health services (SRHS) for men and boys; (4) comprehensive condom
4 programmes; and (5) rapid introduction of PrEP.⁵ PrEP for HIV refers to the use of
5 antiretroviral drugs among HIV-negative people to prevent the acquisition of HIV.⁶
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9 PrEP has shown effectiveness in reducing HIV acquisition among couples, sex workers, men
10 who have sex with men (MSM), transgender and people who inject drugs and AGYW.⁷ The
11 impact of PrEP on the HIV epidemic depends on the extent of PrEP uptake among people at
12 substantial risk for HIV infection (World Health Organization (WHO) defined substantial risk
13 of HIV acquisition as HIV incidence of 3 per 100 person-years or higher in the absence of
14 PrEP).^{7,8} Since September 2015, the WHO recommended offering oral PrEP to every person
15 at substantial risk of contracting HIV.⁷ In the current South African guidelines for PrEP, specific
16 populations considered to be at substantial risk of HIV infection include AGYW, MSM, people
17 with more than one sexual partner, people who inject drugs, people with a recent history of
18 sexually transmitted infections, people who recognise their own risk and request PrEP,
19 serodiscordant couples if the HIV positive partner is not virally suppressed, and sex
20 workers.^{9,10}
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27 Literature on PrEP has largely been focused on knowledge, attitudes, and interest in PrEP. As
28 countries scale up use of PrEP as part of their combination prevention packages, evidence on
29 SDMs that promote uptake and continuation on PrEP are needed especially among vulnerable
30 and hard to reach populations such as AGYW and men. HIV prevention cascades have been
31 proposed as a logical framework to monitor populations at substantial risk for HIV acquisition
32 as they navigate the steps from HIV testing to assessing the risk of the individual to
33 determining PrEP eligibility before PrEP initiation and continuation or discontinuation.
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38 PrEP uptake represents a critical step in the PrEP cascade (Figure 1),^{8,10} because it reflects
39 people's awareness and interest in lowering their risk for HIV. Differentiated models, which
40 are centred around clients' needs and expectations and relieving unnecessary burdens on the
41 health system while targeting behavioural and structural determinants of AGYW and men,
42 can potentially increase acceptability and accessibility of PrEP. These include innovative
43 strategies that streamline HIV testing, link AGYW and men to HIV prevention services, provide
44 differentiating medication access points, reduce stigma and barriers of parental consent for
45 PrEP uptake.¹¹ PrEP SDMs should be designed with the populations being served central to
46 the design.¹²
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[Insert Figure 1 here]

Figure 1: Oral PrEP cascade: Adapted from Dunbar et al (2018)⁸

Following an HIV-negative diagnosis (step 1), an individual is assessed for risk of HIV (step 2). An individual at substantial risk of HIV acquisition or who requests pre-exposure prophylaxis (PrEP) is assessed for eligibility for PrEP (step 3). After documenting eligibility for PrEP use, several baseline clinical investigations are conducted (step 4 PrEP is initiated (step 5) on the same-day as HIV testing. The recommended regimen is TDF (Tenofovir) /FTC (emtricitabine) 1 tablet by mouth daily. PrEP continuation visits (step 6) include: month 1, every 3 months. PrEP is discontinued (step 7) if the individual tests HIV positive, develops renal disease, is non-adherent, does not want or need PrEP, no longer meets eligibility criteria, or if there are safety concerns.

PrEP is an emerging prevention implementation science (IS) research area. However, at present, there is a gap in knowledge on the characteristics of AGYW and men who initiate PrEP compared to those who do not initiate PrEP. This information is critical for informing national policies and implementation guidelines for PrEP roll-out. As such, the aim of this review was to synthesize and appraise the effectiveness and feasibility of PrEP SDMs designed to promote linkage to care among AGYW and men eligible for PrEP in SSA. The objectives were to a) summarize SDMs that promote PrEP initiation and b) explore users' perceptions, and barriers and facilitators of these models.

Methods

We used a scoping review design to map existing literature, explore the research studies conducted and identify research and knowledge gaps in models used to deliver PrEP.¹³ Scoping reviews can be of particular use when the topic has not yet been extensively reviewed or is of a complex or heterogeneous nature.¹⁴ The research question was defined using the PICO (Population- Intervention-Comparison-Outcome) framework (Table 1). We defined our outcomes as i) Linkage to PrEP care (defined as the proportion of AGYW or men who are initiated on PrEP following an HIV-negative diagnosis, step 7 of Figure 1) and ii) perceptions, barriers, and facilitators of SDMs.

Table 1: Scoping review population, intervention, and outcome

Population	Heterosexual females (15-24 years) and men (25-65 years)
Intervention	Interventions (SDMs) designed to improve PrEP uptake
Comparison	Not applicable
Outcome	Linkage to PrEP care (defined as the proportion of AGYW or men who are initiated on PrEP following a HIV-negative diagnosis) and perceptions on SDMs

Protocol and registration

This review was conducted and reported in line with the Joanna Briggs Institute (JBI) reviewer's manual and structured using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for scoping reviews (PRISMA-ScR).^{15,16} A review protocol for this scoping review was registered with the Open Science Framework (DOI 10.17605/OSF.IO/EG9TD).

Research ethics approval

The scoping review focuses on published research in the public domain therefore no ethics approval is required.

Patient and public involvement

No patients or public were involved in the study.

Eligibility criteria

We included primary studies on PrEP service delivery models for AGYW and men, with both qualitative and quantitative study designs published in English and conducted in SSA. No restrictions on the date of publication were applied. Table 2 details the inclusion criteria applied to studies. We excluded studies that were focused exclusively on key population groups in HIV programmes such as lesbian, gay, bisexual, MSM etc. and publication types (e.g., systematic reviews, case studies, etc).

Table 2: Eligibility criteria describing study inclusion criteria for the scoping review

Study type	Quantitative studies including randomized clinical trials (RCT), quasi-randomized, and non-RCTs, longitudinal observational (historical cohorts, prospective cohorts, case-control, and before-and-after studies), analytic cross-sectional studies, and non-comparative studies
	Qualitative studies using any study design
Population	Study population included heterosexual females (15-24 years) and males (25-65 years)
Outcomes	Focus of research: PrEP SDMs i.e., service provision / IS / models of care / differentiated care / linkage to care / intervention
	Papers reporting on barriers and facilitators of PrEP SDMs
	Papers on user perceptions of PrEP SDMs
Setting	Sub-Saharan African countries – based on the World Bank's country classification ¹⁷

Information sources and search strategy

PubMed, Cochrane library, Scopus, and Web of Science including three online conference archives (AIDS conference, Conference on Retroviruses and Opportunistic Infections and International AIDS Society Conference on HIV Science) were searched. The three-step search strategy recommended by the JBI Reviewer's Manual was used.¹⁵ During the first step, one author (WC) conducted an elementary search on PubMed to establish the volume of relevant articles on the topic. Two authors (WC and TR) then screened the title and abstract of the retrieved articles to identify keywords and index terms which were used to build a search strategy (see online supplementary appendix 1). The final search results were exported into EndNote,¹⁹ and duplicates were removed.

Selection of sources of evidence

Titles and abstracts were double screened in Rayyan¹⁸ by any two of a group of eight independent authors (TR, WC, KJ, NJ, DG, TMA, MH, ET). There was no restriction placed on age range during the screening phase to ensure that articles with age disaggregated analysis were included. Full text articles and conference abstracts, including articles from the 2020 AIDS conference were retrieved and independently double screened by WC and TR.

Data charting process and data items

Using a pre-designed data-charting form, key and relevant information were systematically extracted from full-text articles in REDCap²⁰ by any two of a group of ten independent authors (TR, WC, TMA, NJ, DG, BZ, CM, MH, ET, EN). We charted data on article characteristics, population characteristics, intervention characteristics, and key outcomes (Table 1).

Critical appraisal of individual sources of evidence

Information for quality assessment was incorporated into the data charting form on REDCap.²⁰ Due to the different study designs and research methodologies adopted in the included studies, we used three different tools to appraise the articles. For comparative studies including randomised trials, non-randomised trials, interrupted time-series and controlled before-after-studies, we used the risk of bias criteria recommended by the Effective Practice and Organisation of Care (EPOC).²¹ For qualitative studies, we used the Critical Appraisal Skills Programme (CASP) checklist.²² For other studies we used the Ways of Evaluating Important and Relevant Data (WEIRD) tool.²³ Modelling studies were excluded from the appraisal step.

Analysis

For quantitative studies we used a narrative analysis and tabulated data by gender and by SDM. We summarized the settings, populations, and sample for each group, along with the interventions and findings. For qualitative studies, we analysed themes, authors'

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3 interpretations, and quotes and integrated these findings to support the quantitative data.
4 We tabulated the data by SDMs (health facility, community, research, or mobile) and by
5 population (AGYW only, men only, or models for both). Furthermore, we determined the
6 existing gaps in the different categories of interventions that can be strengthened to promote
7 uptake and continuation on PrEP among AGYW and men.
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11 12 13 **Results**

14 **Selection of sources of evidence**

15 Our search identified 1604 citations. After duplicates (413) were removed, a total of 1204
16 titles and abstracts were identified from searches of electronic databases and 13 from other
17 sources including conferences. The PRISMA flow diagram (Figure 2) illustrates the screening
18 process to identify records that meet the study inclusion criteria. Based on the screening of
19 title and abstracts, 1102 records were excluded, with 102 full text articles and conference
20 abstracts to be retrieved and assessed for eligibility. From the review of full text articles 67
21 were excluded for the following reasons: editorials/commentaries/reviews/protocols,
22 interviews with stakeholders, articles on topical PrEP, wrong outcome and focus on key
23 populations. During data charting, two additional articles were excluded. Four additional
24 articles were added after the initial search process, these articles were identified following
25 the 2020 AIDS conference in July. The final number of studies that were considered eligible
26 for this scoping review were 37 (27 studies and 10 conference abstracts).
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35 **[Insert Figure 2 here]**
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39 **Figure 2:** PRISMA flow diagram

40 Adapted from: Moher et al²⁴
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42 **Description of sources of evidence**

43 A description of the characteristics, setting, SDMs and intervention modalities of the included
44 studies are provided in online supplementary appendix 2. There was a mixture of quantitative
45 (n=23), qualitative (n=11) and mixed method studies (n=3). Most studies were
46 demonstration/IS projects (n=10) while other methodological approaches included
47 randomised controlled trials (RCTs) (n=5) and cross-sectional studies (n=5). Most were
48 conducted in Kenya (n=17), with the remainder conducted in Uganda (n=10), South Africa
49 (n=10), Tanzania (n=3), Malawi (n=2), Mozambique (n=2), and Zimbabwe (n=1). These studies
50 reported evidence on the following PrEP SDMs; health facility (6), mobile (1), research site
51 (8), community (6), hybrid (10), and not described/not applicable (6). Thirteen studies focused
52 on AGYW, 19 studies focused on AGYW and men, one study focused on men only, and four
53 were classified as other (i.e., age categories were not specified). PrEP services were offered
54 in 25 of the 37 studies whilst PrEP perceptions/opinions were assessed in the other 12 studies.
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Critical appraisal of evidence

Full text articles appraised using the WEIRD tool were mostly assessed as having either no or very minor or moderate concerns for items that were unclear in the article (see online supplementary appendix 3). Most of the qualitative studies or abstracts performed well on all items except on items 4 (the recruitment strategy was appropriate to the aims), 8 (the rigour of the data analysis) and 10 (the value of the research in terms of its contribution to the literature and/or policy and process). Due to limited information in the abstracts to clearly answer the items using the WEIRD tool, most of the abstracts were appraised as either having an unclear or serious risk of bias.^{31-33,36,43,51}

Results of sources of evidence

PrEP SDMs for AGYW

Amongst AGYW, PrEP SDMs included HF-B (n=6), hybrid (mobile clinic-healthcare facility or community-healthcare facility, n=3), research site (n=2) and mobile clinic (n=1)(see online supplementary appendix 2).

Health facility

Three studies from Kenya evaluated a HF-B delivery modality by integrating PrEP delivery into routine services. Mugwanya et al.²⁶ evaluated integrated delivery of PrEP in family planning (FP) clinics whilst Kinuthia et al. and Pintye et al. evaluated approaches to integrate PrEP into MCH clinics providing antenatal care (ANC) and post-natal care (PNC).^{27,28} Integration of universal screening and counselling for PrEP in FP and MCH clinics resulted in PrEP uptake of 16% and 49.2% respectively among AGYW. Younger women (≤ 24 years) who initiated PrEP at MCH clinics were significantly more likely to return for a PrEP refill at month 3 compared to women >24 years (54.9% versus 45.1%) ($p=0.05$).²⁸ These studies utilised nurses dedicated to providing PrEP services only, which may limit applicability in a sub-Saharan setting where facilities have a limited clinical workforce. A study by Ngure et al. which integrated PrEP with FP services found that PrEP dispensation was more frequent among those concurrently using effective contraception, (adjusted relative risk [aRR]=1.19; 95% confidence interval [CI]=1.08-1.32) and contraceptive use was more common among those on PrEP (aRR=1.63; 95% CI=1.18-2.25).⁵⁹ Pintye et al. found that participants who initiated PrEP at MCH clinics took an additional 18 minutes for PrEP related activities over and above the time spent at the clinic to receive routine MCH services. The additional time could deter AGYW from initiating and continuing PrEP and depending on healthcare facility size and patient volume integrating PrEP into these routine services could result in several additional hours of work for nurses.²⁷

Hybrid (community-health facility)

Two studies evaluated the scaling up of PrEP in Kenya through integration into routine health services in drop-in centres (DICEs), public and private health facilities.^{32,35} Ongwen et al. reported that within the context of the Jilinde project, which implements oral PrEP as a routine service at a public health scale in Kenya, 6.5% AGYW initiated PrEP, and DICEs were

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3 the preferred PrEP outlet for adolescent girls with 66% accessing services in DICEs, 25% in
4 public clinics and 9% in private clinics. Amongst AGYW who initiated PrEP, the entry channel
5 into the PrEP pathway was through peer educators and networks (50%); community
6 outreaches (20%); and within health facilities (30%).³² Were et al. found that among all
7 individuals eligible for PrEP in the study which included female sex workers and MSM, 11% of
8 AGYW initiated PrEP.³⁵ The majority (81%) of clients initiated PrEP through DICEs, whereas
9 14% and 5% were initiated through public and private facilities respectively. The majority of
10 AGYW did not persist on PrEP use at month-1 (68% drop off) and month-3 (94% drop off)
11 follow-ups. Qualitative evidence from this study found that AGYW who initiated PrEP in public
12 and private health facilities reported insensitive referral and access to the PrEP delivery
13 pathways where *"The (HIV) testing place is different from the place I was asked questions and*
14 *the place for collecting the medicine is also different. We took long because we were walking*
15 *form one place to another".³⁵*

22 23 Research site

24 Delany-Moretlwe conducted an RCT in Tanzania and South Africa to evaluate whether
25 empowerment clubs increased PrEP uptake and continuation among AGYW. Participants
26 were randomised to SoC, which included comprehensive SRHS, with counselling and short
27 message service (SMS) reminders for PrEP users, or to empowerment clubs plus SoC. Across
28 both arms, 97% initiated PrEP. PrEP continuation did not vary significantly by study arm and
29 diminished with time (73% at Month-1, 61% at Month-3 and 34% at Month-6).³⁴ Donnell et
30 al. found that HIV incidence declined significantly after on-site provision of PrEP at the
31 research sites.⁶⁰ Hill et al. found that epidemiologic HIV risk scores were positively associated
32 with PrEP interest, and that high numbers of AGYW both above and below the high-risk cut-
33 off were very interested in PrEP (68% vs. 63%).³⁰

39 40 Mobile

41 A South African study found that integrating PrEP with SRHS and delivering it via an
42 adolescent-friendly mobile clinic led to an increase in both PrEP initiation and contraception.
43 AGYW who were using contraception were significantly more likely to initiate PrEP (76%) on
44 the same-day compared to those who were not using contraception and declined PrEP (66%)
45 (p=0.001). Contraception was initiated by 44% of AGYW on the same-day as PrEP initiation
46 compared to 30% who declined PrEP (p=0.003).³³ No qualitative evidence on the acceptability
47 and feasibility of mobile delivery models were identified.

52 53 **Overall perceptions of SDMs by AGYW**

54 In a study conducted in Malawi, Maseko et al found high levels of hypothetical PrEP
55 acceptability among AGYW who reported that interest in PrEP depends on confidential access
56 and discrete packaging (cartons or bottles that resemble treatment for common ailments) of
57 the drug. Moreover, AGYW reported that youth-friendly delivery modalities such as schools
58 and youth-friendly sections of health centres that provide *"...a place for the youths to be*
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3 *comfortable getting these drugs...*” may facilitate the initiation of PrEP as a prevention
4 strategy.²⁵
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7 **PrEP SDMs for men**

8 We found one mixed method study among young South African men. PrEP was not provided,
9 but hypothetical perceptions, barriers and enablers of PrEP uptake were assessed. Whilst only
10 11% of men were aware of PrEP, 62% reported that they were very likely to take it. The young
11 men preferred to keep PrEP use a secret from their partners, friends, and family. Uptake of
12 PrEP was also dependent on the SDM used. Receiving PrEP from the clinic was reported as a
13 barrier to PrEP usage as this could incite community stigma. Young men reported that “...they
14 (community) would immediately think that you are HIV positive already, not that you are
15 taking the prevention one...”
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20 **PrEP SDMs for AGYW and men**

21 We found 19 studies that assessed various SDMs for linkages to PrEP for AGYW and men.
22 Amongst AGYW and men, PrEP SDMs included hybrid (research site-healthcare facility or
23 community-healthcare facility, n=8), community (n=5) and research site (n=6). These studies
24 either recruited serodiscordant couples or included AGYW and men as individual participants.
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30 Hybrid

31 We identified seven studies that used a hybrid model to deliver PrEP.^{38-42,44,49}
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33 One study from Kenya and Uganda by Heffron et al. involved a hybrid (research site- health
34 facility) model that integrated PrEP delivery into antiretroviral therapy (ART) treatment
35 services for high-risk HIV serodiscordant couples.⁴⁹ The intervention was mainly couples-
36 based and involved HIV prevention counselling; safer conception counselling or
37 contraceptives; counselling and HIV testing for HIV-negative partner; PrEP
38 initiation/prescription; and referral to a local health facility for the HIV infected partner for
39 ART. The results showed high uptake of integrated PrEP and ART with an estimated 96%
40 reduction in HIV incidence (82.9% of couples used PrEP or ART and there were no HIV
41 seroconversions, 14.5% used some ART and/or PrEP and 2.6% used neither PrEP nor ART).⁴⁹
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49 Qualitative evidence that explored HIV serodiscordant couple’s decision-making and
50 motivations to initiate PrEP through this integrated ART-PrEP approach showed that a positive
51 clinical encounter with a healthcare provider and client-friendly services played a critical role
52 in the couple’s decisions to initiate and continue PrEP.³⁸ Clear messaging, in-depth
53 counselling and friendly, non-judgmental/stigmatizing services provided by healthcare
54 workers empowered, reassured and promoted PrEP uptake among HIV serodiscordant
55 couples with some describing it as “*service beyond the medicine*’.³⁸ Furthermore, being at a
56 place where service is offered to both couple (ART for the HIV positive partner and PrEP for
57 the HIV-negative partner) motivated their decision.³⁸
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5 Five studies used a hybrid mobile testing approach implemented at community health fairs,
6 home, or local health facility.³⁹⁻⁴³ Two studies from Kenya and Uganda showed that PrEP
7 initiation was high (>75%) among individuals who received HIV testing on the same-day.^{39,40}
8 Mayer et al. found that 39% of participants initiated PrEP within 4 weeks of the community
9 health campaign.⁴¹ However, the distance between the participants and the healthcare
10 provider influenced PrEP initiation.
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13
14 Koss et al. and Camlin et al. who explored barriers influencing uptake and continuation of
15 PrEP using the hybrid (community-health facility) model,^{42,43} found that PrEP initiation was
16 hindered by HIV/ART-related stigma which emanated from the colour of the pill being the
17 same as HIV treatment regimens, and access of PrEP services at the same facility where HIV
18 care is provided.⁴² Men reported that the “... majority of us fear to go to the health center...”
19 and suggested alternatives such as designating a clinic day for PrEP or “...distribute [PrEP] to
20 the people...”. Participants reported that healthcare workers should deliver PrEP or find
21 delivery methods that are easily accessible by the community “...just like they did with
22 condoms.” Young adults who attended school outside the community could not initiate PrEP
23 given that PrEP was only provided within study communities. Furthermore, school attendance
24 made initiating and continuing PrEP challenging.^{42,43}
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31 Community

32 Two South African studies conducted in a community setting explored the hypothetical
33 opinions of PrEP among salon owners, stylists, and clients.^{45,46} Ninety-five percent of owners
34 and stylists and 77% of clients were comfortable with PrEP being offered at hair salons,⁴⁵
35 which provide a geographically convenient and conducive environment for receiving health
36 services.^{45,46} A third community-based study which used a 90-second PrEP demand creation
37 video and informational brochures, found that 68% and 56% of young women respectively
38 reported that they were definitely interested in learning more about and initiating PrEP. The
39 study also found that young women preferred realistic visuals that they could identify with,
40 rather than highly stylized models. Data evaluated by Lubwama et al. showed that 69.2% of
41 key populations which included AGYW and serodiscordant couples were reached through
42 drop-in centres and community-based outreach centres providing PrEP versus fixed public
43 health facilities.⁴⁷ The proportion that returned for PrEP was higher among serodiscordant
44 couples (3 months: 56.9%, 6 months: 46.8%) compared to sex workers (3 months: 37.5%, 6
45 months: 26.3%).
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52 Clinical Research Site

53 In three of the six studies conducted at a clinical research site,^{37,48-53} PrEP was integrated with
54 ART or with ART and other interventions such as VMMC.^{37,49,53} Across the three studies, ≥95%
55 of the HIV-negative partner within serodiscordant couples initiated PrEP. The use of PrEP in
56 combination with ART or other prevention interventions (VMMC) or conception strategies
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3 resulted in reduced HIV incidence. Serodiscordant couples found that the “couples-focused”
4 services provided through the integrated PrEP-ART strategy strengthened their relationships.
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7 **Overall perceptions of SDMs by AGYW and men**

8 Several studies explored factors that influence PrEP uptake, non-initiation and
9 discontinuation in individuals who received PrEP through the different SDMs.^{38,42-44,50,51}
10 Motivators to initiate PrEP included: perception of high-risk, preference of PrEP over other
11 HIV prevention methods, protection from unwanted/forced sexual encounters, love for one's
12 partner, knowledge about PrEP and the belief it is effective, partner support belief that PrEP
13 supported life goals and a positive clinical encounter.^{38,42-44,50,51,61} Females preferred a
14 product that was delivered at a health clinic over accessing it at a pharmacy.⁵⁴ Barriers to PrEP
15 initiation included daily pill burden, side effects, mixed dosing messaging, living with parents
16 or attending school, partners consent or partners reaction to use and HIV-related stigma.<sup>38,42-
17 44,50,51,61</sup>
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24 **Other models**

25 We identified four other studies that explored other methods of promoting PrEP uptake
26 among AGYW and men.⁵⁵⁻⁵⁸ Jani et al. explored male partners support for hypothetical PrEP
27 use by AGYW.⁵⁵ Male partners highlighted that their support would be contingent on their
28 early involvement in the decision-making process regarding PrEP which would alleviate
29 suspicion of infidelity. AGYW suggested that not including male partners may result in social
30 harms (partner violence, dissolution of relationships). Strategies recommended by male
31 partners included couples counselling, educating, and providing PrEP to men and community
32 sensitization. Makyao et al. explored parental support of AGYW's hypothetical use of PrEP.
33 Parents supported PrEP availability acknowledging the risks faced by AGYW.⁵⁶ However,
34 support was also influenced by social norms (promoting promiscuity or condoning sexual
35 activity). Differential parenting roles influenced the type of support: mothers suggested
36 providing a conducive environment (good diet) for PrEP use whilst fathers suggested
37 providing operational support (transport money). Cremin et al. and Irungu et al. reported that
38 providing time-limited PrEP during periods of increased exposure would be a novel, efficient
39 and cost-effective strategy for providing PrEP.^{57,58}
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49 **Discussion**

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51 The purpose of this review was to synthesize and appraise the effects on PrEP initiation and
52 the acceptability and feasibility of PrEP SDMs designed to promote linkage to care among
53 AGYW and men eligible for PrEP in SSA. Given the challenging interactions between AGYW
54 and men and the health system, we reviewed evidence of PrEP initiation in a range of SDMs
55 i.e., health facility-, mobile-, community- based or hybrid models, and we explored the
56 perceptions, barriers, and facilitators of these models. This scoping review identified 27
57 primary studies and 10 conference abstracts.
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5 Delivery of PrEP to AGYW included HF-B models which integrated PrEP into routine FP/MCH/
6 SRH/ANC services, hybrid models which allowed AGYW to initiate PrEP either at community-
7 based venues or private or public facilities and mobile models. Whereas integrated models
8 provided at a public health facility offer a potential “one-stop” location for AGYW to initiate
9 PrEP whilst accessing other services, the additional time spent on PrEP-related activities may
10 deter AGYW from initiation. Integrated delivery of PrEP provides an opportunity to respond
11 to potential syndemics in AGYW who are eligible for PrEP; however, we found mixed results
12 regarding the effectiveness of integrated models on PrEP initiation. Two studies in which PrEP
13 was initiated in an FP or MCH clinic showed PrEP initiation of <50% with uptake being higher
14 in women >24 years.^{26,28} A third multi-country study which integrated PrEP with SRHS at FP
15 clinics showed 90% PrEP uptake.³¹ These studies were primarily implementation studies
16 without a comparator, and PrEP related activities were provided by a PrEP-dedicated nurse.
17 This task-shifting strategy removed this additional service from the workload of already
18 overburdened routine nurses; however, the feasibility of this approach requires further
19 evaluation considering the human resources challenges in SSA.
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27 Adolescent-friendly clinics or adolescent-friendly sections within health facilities were also
28 shown to promote uptake of PrEP.^{25,31,33} However, a New York study of adolescents’ PrEP
29 awareness showed that 86% of adolescents eligible for PrEP reported never being informed
30 about PrEP by their healthcare professionals.⁶⁴ Taggart et al. found that provider attitudes
31 and recommendations within a healthcare facility influence adolescents’ willingness or
32 unwillingness to use PrEP.⁶⁵ Our results show that AGYW favour community-based youth-
33 friendly delivery modalities of PrEP such as DICEs or schools over delivery via public and
34 private health facilities. These findings concur with other studies which have shown that
35 factors that influence US women's decision-making about the use of PrEP include the ease of
36 accessing services and medication close to their homes.^{66,67} Moreover, women highlighted
37 the importance of community peers in influencing their decisions to initiate PrEP.⁶⁷
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44 We identified only one study among young, heterosexual men that explored the hypothetical
45 perceptions of PrEP uptake. Men reported that if PrEP was available, they would use it.
46 However, uptake was dependent on SDM and a HF-B model was not favoured due to
47 community stigma.³⁶ Heterosexual men are not classified as a key or vulnerable population in
48 the HIV prevention response, as such research that focuses on the uptake of PrEP or SDMs
49 among heterosexual men is limited.
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53 In studies that targeted both women (including AGYW) and men, SDMs included a hybrid
54 approach (research site-community or community-health facility), community-based models
55 and those based at research sites. PrEP delivery to serodiscordant couples involved integrated
56 models such as delivery of PrEP and ART to serodiscordant couples allows both partners to
57 interact with the health system. In such models, PrEP is initiated and continued only until the
58 HIV infected partner achieves viral suppression which may be a cost-effective approach if viral
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3 suppression is achieved timeously.⁴⁹ However, in a sub-Saharan setting where <65% of people
4 living with HIV have suppressed viral load (VL) (<1000 copies/mL) and there are health
5 systems challenges with VL testing and turn-around-time, integrated delivery of PrEP and ART
6 may not be feasible.^{1,68} Our findings have shown that community-based models which involve
7 same-day HIV testing and PrEP initiation are favourable especially among men.⁴⁰
8 Furthermore, the delivery of PrEP through innovative community-based venues such as hair
9 salons which provided a comfortable and familiar environment yielded high interest in PrEP
10 initiation.⁴⁶ Many participants reported the convenience of pharmacies located close to public
11 transport routes, as many did not have access to cars or did not want to bear the cost of fuel
12 incurred travelling to the clinic.⁶⁹
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18 Both AGYW, men and serodiscordant couples have expressed that PrEP initiation is influenced
19 by the setting i.e., a friendly environment and by the attitude of healthcare workers i.e., non-
20 judgmental/non-stigmatizing.^{31,38} This suggests that the successful delivery of PrEP to AGYW
21 or men using HF-B models either through integrated or standalone approaches requires
22 healthcare workers to play an essential role.^{62,63} Structural barriers to PrEP initiation included:
23 the distance to travel to and time spent at health facilities. To address these barriers, there
24 is an increasing need for differentiated SDMs that provide alternative access options
25 especially considering that PrEP is a prevention intervention delivered to individuals who are
26 generally of good health and who may be disinclined to travel long distances and wait in long
27 queues to access PrEP.⁷⁰
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32 *Policy and programme recommendations and future research areas*

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34 Notably, literature on PrEP SDMs for AGYW and more especially heterosexual men is limited
35 thus calling for more research in these areas. In order to increase PrEP uptake, country
36 programme implementers need to understand which SDM/s work for AGYW or men and to
37 adapt these to best suit the unique needs of the users.⁷¹ Opportunities exist for integrated
38 strategies of PrEP delivery at a health facility or mobile clinic. However, we need to
39 understand which integrated strategy (e.g., integration with ART, SRHS, or contraceptive
40 services) is most acceptable and scalable for AGYW and men. Training and retraining of
41 healthcare workers on PrEP guidelines is essential to equip them with the skills to ensure that
42 PrEP is delivered in a friendly and safe space by non-stigmatizing healthcare workers. To
43 mitigate the time burden and travel expenses incurred by AGYW and men, same-day initiation
44 of PrEP to those eligible and multi-months dispensing of refills should be considered.^{11,70,72}
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50 Furthermore, task-shifting among healthcare workers along the PrEP cascade will avoid
51 additional burden on the health system. Further studies are required to evaluate the
52 feasibility of PrEP-dedicated nurses. Differentiated SDMs are needed to take PrEP to where
53 users live, socialise and work.¹¹ These models include home deliveries, pharmacies, DICES,
54 salons, mobile clinics and tele-medicine-assisted models in both the public and private health
55 sectors. Mobile clinics near schools could be successful but need to be regular, reliable, and
56 sustainable. Furthermore, considering that eligibility for continuation on PrEP requires repeat
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3 HIV testing, there is a need for interventions (e.g., HIV self-testing) to address this challenge
4 when PrEP is delivered at non- HF-B settings.
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7 **Limitations**

8 The strengths of this review include the inclusion of multiple databases across disciplines and
9 broad inclusion criteria. We also used a comprehensive search strategy that followed the JBI
10 reviewer's manual and structured using PRISMA-ScR guidelines, and robust methods that
11 included double data screening, extraction, and review. Another strength is that we included
12 grey literature and unpublished reports which minimizes the chances of missing studies with
13 negative or null findings. Limitations include the exclusion of studies conducted in non-SSA
14 and that were published in non-English languages. In addition, due to a lag in adding and
15 indexing articles in various online databases, our review could fail to locate the most recent
16 publications and research on SDMs for PrEP uptake. Another limitation was that most of the
17 included studies were from 3 countries (Kenya, Uganda, and South Africa) hence the
18 generalisability of the results to SSA might be limited. Furthermore, many of the studies
19 evaluated the hypothetical perceptions of PrEP uptake which may not translate to actual
20 realities.
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28 **Conclusions**

29 We conducted a scoping review on PrEP SDMs, summarising evidence on PrEP initiation using
30 existing models among AGYW and men and explored the users' perceptions, and barriers and
31 facilitators of these models. These models were mostly found to be hybrid approaches
32 (research site-health facility or community-health facility), community-based or based at a
33 research site. Community-based models at convenient locations were favoured by both
34 AGYW and men. Integrated strategies delivered at friendly health facilities by non-
35 stigmatising healthcare providers was also a preferred PrEP delivery channel. The successful
36 uptake of PrEP by AGYW and men will be dependent on the service setting where it is offered
37 and cannot be considered as a one size fits all approach. Care must be taken to find the
38 delivery method best suited to each sub-population. Future research should focus on what
39 differentiated SDMs work for AGYW and heterosexual men to identify which approach is most
40 successful in improving PrEP uptake and to understand their individual needs when using
41 these models.
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All authors contributed to conceptualising and designing the study. WC and TR conducted the literature search. WC, TR, KJ, NJ, DG independently performed screening. WC, TR, CM, EN, ET, MH, TMA, NJ, DG, BZ independently performed data extraction. EN developed the data charting form on REDCap. WC and TR performed initial data synthesis and interpretation and all authors refined it. WC and TR drafted the manuscript. All authors contributed to writing and reviewing the manuscript.

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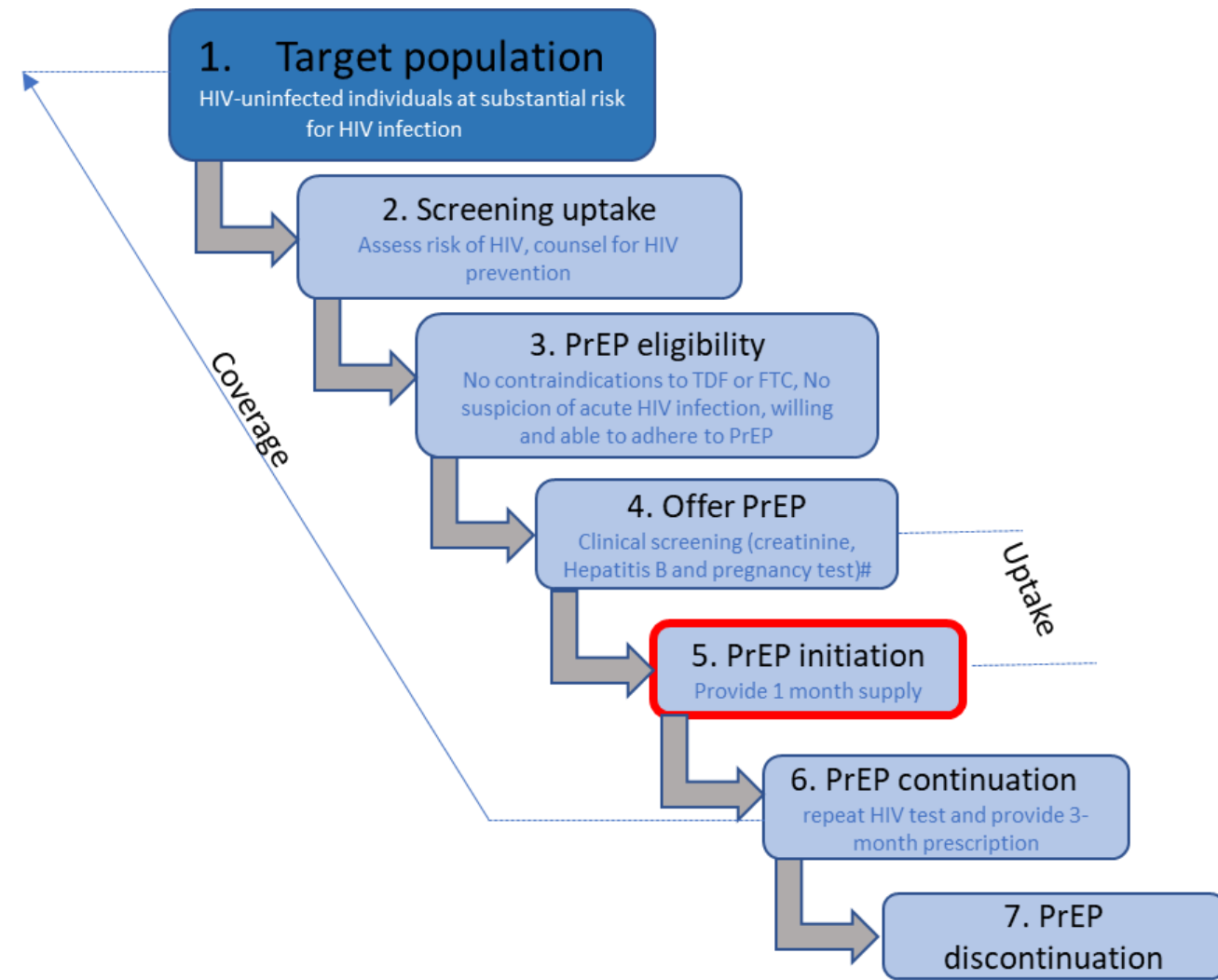
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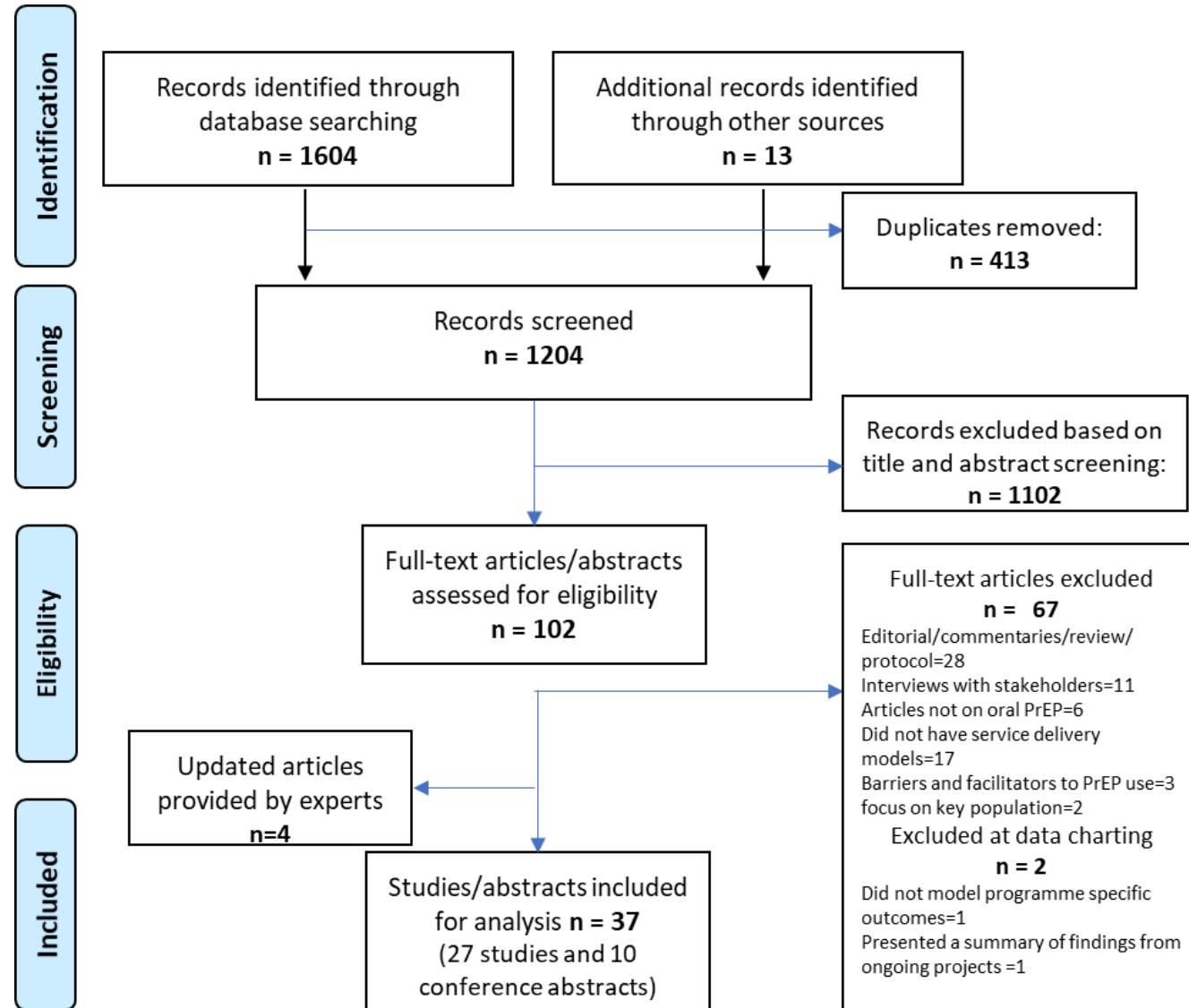
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SET		SEARCH TERMS
1	1 HIV	HIV-1
2		HIV
3		Hiv
4		Set 1- 3 will be combined with "or"
5	2 Pre-exposure Prophylaxis	PRE-EXPOSURE PROPHYLAXIS
6		Pre-Exposure Prophylaxis
7		PrEP
8		Set 5-7 will be combined with "or"
9		Set 4 and 8 will be combined with "and"
10	3 Linkage to care	service provision
11		service delivery
12		SDMs
13		IMPLEMENTATION SCIENCE
14		model
15		models of care
16		differentiated care
17		linkage
18		linkage to care
19		intervention
20		Set 10-19 will be combined with "or"
21		Set 4, 9 and 20 will be combined with "and"
22	4 Country	DEVELOPING COUNTRY
23		Sub-Saharan
24		AFRICA SOUTH OF THE SAHARA
25		AFRICA
26		<i>All sub-Saharan countries included as MeSH and text term combined with or</i>
27		Set 22-26 will be combined with "or"
28		Set 4, 9, 20 and 27 will be combined with "and"

Service Delivery Modality	Author (Year) and study setting	Publication type and objectives	Study population and Sample	Intervention description	Detailed Description of Findings
Studies among AGYW					
Health facility^a	Maseko et al. (2020) ²⁵ Malawi	Manuscript To understand knowledge of, interest in, concerns about, and delivery preferences for PrEP among AGYW enrolled in the Girl Power study.	Study population: Never been offered to use PrEP services (hypothetical opinions related to PrEP) Sample Sample size (total – N): 40 Gender distribution: Female: 100% Age distribution: 15-19yrs: 21; 20-24yrs: 19	Nature of Intervention: Four models of service-delivery were compared in four separate clinics: Model 1) standard of care (SoC), Model 2) Integrated youth-friendly health services; Model 3) Model 2 plus a small-group behavioural intervention on; and Model 4) Model 3 plus a cash transfer (\$5.50/month). An explanation of PrEP was provided to 40 participants prior to IDI Intervention components: HIV testing, syndromic management of STIs, family planning, and condom distribution. NB: PrEP was not provided in this study, nor was it available in government clinics at the time of the study.	<ul style="list-style-type: none"> • Interest in PrEP based on a belief that their HIV risk exposure was due to factors that were out of their control, including partners having concurrent relationships, challenges with condom negotiation/use, and rape. • Disinterest in PrEP included: perception of low risk because of abstinence or having a single partner, use of PrEP implying infidelity among married AGYW, taking pills daily implying HIV infection. • Interest in initiating PrEP depends upon: <ul style="list-style-type: none"> - ease of accessing PrEP (confidential), - packaging attributes (discrete, cartons, packets, or bottles that would give the appearance of medications for common ailments preferred - delivery context (available in locations frequented by youth such as schools or youth friendly spaces because of ease of access and comfort in the absence of adult patients and family members).
Health facility^b	Mugwanya et al. (2019) ²⁶ Kenya	Manuscript To demonstrate the feasibility of integrating PrEP delivery within routine family planning clinics to reach at-risk AGYW for PrEP in HIV high burden settings.	Study population: Offered to use PrEP services Sample Sample size (total – N): 1271 Gender distribution: Female: 100% Age distribution: Median: 25 (22-29) <20: 105 20-24: 522 25-29: 356 30-34: 172	Nature of Intervention: PrEP-dedicated nurse-led integrated delivery of PrEP in family planning clinics Intervention components: Newly hired nurses were trained on HIV risk assessment, counselling, and PrEP provision. These nurses performed only these duties at the FP clinic. Women attending FP clinics completed other services were then referred to the PrEP-dedicated nurse. This nurse counselled and assessed	<ul style="list-style-type: none"> • Of 1,271 women screened, 22% initiated PrEP, and 41% returned for at least one refill. • PrEP uptake was independently associated with reported male-partner HIV status ($p < 0.001$) and marital status ($p = 0.04$). • More women >24 years (26%) initiated PrEP compared to young women <24 years (16%). • For women >24 years, the likelihood of initiating PrEP increased by about 3% for each additional year of a woman's age ($p < 0.001$).

			≥35: 116	willingness to consider PrEP (guided by a national guidelines and HIV risk assessment screening tool). Interested and medically eligible women were provided same-day PrEP initiation.	<ul style="list-style-type: none"> • FP clinics can be an effective platform to efficiently reach HIV at-risk women who may benefit from PrEP. • Integration of PrEP delivery in FP clinics, makes this a potential "one-stop" location for FP and PrEP. • Although FP visits are busy, efficient implementation strategies such as less frequent PrEP visits and expanding the pool of providers who might be able to screen and provide PrEP beyond the few clinicians and nurses (e.g., training and empowering HIV testing counsellors and community health workers or peer educators) can be built into existing routine services.
Health facility^b	Pintye et al. (2018) ²⁷ Kenya	Manuscript To define approaches for integrating PrEP into routine antenatal and post-natal care (ANC/PNC) using PrIYA Program as a case study.	Study population: Offered to use PrEP services Sample Sample size (total – N): 16 Health facilities; 40 program-supported nurses Gender distribution: Female 100% Age distribution: not described	Nature of Intervention: Nurse-led teams worked with maternal and child health (MCH) staff at 16 public, faith-based, and private facilities to determine optimal clinic flow for PrEP integration into antenatal (ANC) and postnatal (PNC) care. A program-dedicated nurse facilitated integration. Intervention components: All ANC/PNC clients received assessment for behavioural risk (completion of a questionnaire and willingness to consider PrEP, general informational counselling on PrEP depending on the client's awareness and interest in PrEP. Among clients who were willing to initiate PrEP, PrEP counselling also included information on how to use PrEP and adherence as well as medication dispensation.	<ul style="list-style-type: none"> • Clinics developed two approaches for integrating PrEP delivery within ANC/PNC: 1) co-delivery: ANC/PNC and PrEP services delivered by same MCH nurse or 2) sequential services: PrEP services after ANC/PNC by a PrEP-specialized nurse. • 86 ANC/PNC visits were observed. • Clients who initiated PrEP took a median of 18 minutes (IQR 15-26) for PrEP-related activities (risk assessment, PrEP counselling, creatinine testing, dispensation, and documentation) in addition to other routine ANC/PNC activities. • For clients who declined PrEP, an additional 13 minutes (IQR 7-15) was spent on PrEP-related risk assessment and counselling. • PrEP-specific activities took <20 minutes per client, the moderate additional time burden for PrEP initiation in MCH would likely decline with community awareness and innovations such as group/peer counselling or expedited dispensing.
Health facility	Kinuthia et al. (2020) ²⁸ Kenya	Manuscript We implemented and evaluated a novel programme	Study population: Offered to use PrEP services Sample Sample size (total – N): 9376 women	Nature of Intervention: Integration of PrEP into existing structures at 16 maternal and child health clinics (public, faith-based, and private sector) At each facility,	<ul style="list-style-type: none"> • PrEP initiation: 2030 (21.7%) women-initiated PrEP: 79.3% women with partners living with HIV, 37.2% with partners of unknown HIV status, and 11.6% women with HIV-negative partners.

		to provide PrEP in maternal and child health clinics in Kenya	<p>Gender distribution: Female:100%</p> <p>Age distribution: <24: 5033 Median age: 24 years (IQR: 21-28)</p>	<p>they offered sensitisation sessions to introduce the programme, educate facility staff on PrEP, and seek advice on the best way to integrate PrEP delivery at the facility.</p> <p>Intervention components: Programme nurses approached all eligible women provided PrEP counselling as part of routine maternal and child health clinic processes. Risk was assessed using a using a risk assessment tool Women who did not know the HIV status of their partners were offered HIV self-testing kits, if they were willing to test with their partners at home. All women (regardless of risk factors) were informed that PrEP was available if they perceived they were at risk for HIV.</p>	<ul style="list-style-type: none"> • 999 (49.2%) women who initiated PrEP were younger than 24 years • Reasons for initiating PrEP: having a partner living with HIV or of unknown HIV status and feeling at risk for acquiring HIV. Reasons for declining PrEP: need to consult partner and low perceived HIV risk Factors associated with initiation: being younger than 24 years, having a partner living with HIV or of unknown HIV status, gestational age less than 26 weeks among pregnant women, having experienced intimate partner violence in the previous 6 months, or sharing needles while engaging in injection drug use, diagnosed or treated for an STI, forced to have sex, and had recurrently used PEP. • PrEP continuation: 38.7% of 2030 women returned for PrEP refill at least 1 month after initiation • Factors associated with continuation: women with HIV-positive partners. • Reasons for discontinuation: side effects, no longer perceiving HIV risk, and partner known to be HIV-negative. • PrEP refills: 21.7% of women who initiated PrEP at least 3 months before this evaluation returned for PrEP refill. Of these 242 (54.9%) were younger than 24 years and 199 (45.1%) were aged 24 years or older (p=0.05).
Health facility	Pintye et al. (2019) ²⁹ Kenya	<p>Conference abstract</p> <p>To understand motivations for early PrEP discontinuation among AGYW and Adolescents (PrIYA) Program</p>	<p>Study population: Offered to use PrEP services</p> <p>Sample Sample size (total – N): 69 AGYW 69 in-depth interviews: 21 AGYW received, but never used PrEP • 24 discontinued PrEP within 1 month • 24 discontinued PrEP within 3 months</p> <p>Gender distribution: Females: 100%</p> <p>Age distribution:</p>	<p>Nature of Intervention: The PrIYA Program provides real world evidence on delivering PrEP to AGYW seeking routine ANC, PNC and family planning (FP) services within 16 MCH clinics in Kisumu County, Kenya</p> <p>Intervention components: N/A AGYW were identified by program nurses and purposively sampled based on 3 categories</p>	<ul style="list-style-type: none"> • Interest in initiating PrEP was heavily influenced by one-on-one interactions with a close friend, relative, or teacher/professor • Early PrEP discontinuation patterns were influenced by side effects (feared or experienced) and important life events AGYW frequently stopped PrEP after childbirth and found it challenging to remember to take PrEP during the complex transition to motherhood • AGYW reported that pre-initiation counselling focused on adherence; many were unaware that they could restart PrEP after stopping

			Age (years) 22 (20-23)		<ul style="list-style-type: none"> Messaging on stopping/restarting PrEP tailored to life events common among AGYW, such as childbirth and periods away from partners, could promote appropriate PrEP use
Health facility^a	Hill et al (2020) ³⁰ Malawi	Manuscript To understand the level of interest in PrEP among AGYW at highest HIV risk, and the potential role of perceived risk in motivating PrEP interest.	<p>Study population: Never been offered to use PrEP services (hypothetical opinions related to PrEP)</p> <p>Sample <i>Sample size (total – N):</i> 825 <i>Gender distribution:</i> Female: 100% <i>Age distribution:</i> Median: 20 [18 to 22] (range: 15 to 27)</p>	<p>Nature of Intervention: AGYW rated their potential interest in using PrEP after receiving this explanation: "PrEP is a medicine that can be used to prevent HIV for people who are HIV-negative. To be protected with PrEP, a pill is taken every day. These pills contain some of the same medicine used to treat people who already have HIV. PrEP is not currently available in Malawi."</p> <p>Intervention components: participants were enrolled and followed for one year. NB: PrEP was not provided in this study, nor was it available in government clinics at the time of the study.</p>	<ul style="list-style-type: none"> Epidemiologic risk scores were positively associated with PrEP interest, high numbers of AGYW both above and below the high-risk cut-off were very interested in PrEP (68% vs. 63%). Perceived risk partially explained the relationship between HIV risk and PrEP interest; greater epidemiologic HIV risk was associated with high perceived risk, which was in turn associated with PrEP interest. Many more high-risk AGYW were interested in PrEP (68%) than expressed a high level of perceived HIV risk (26%). High number of participants with risk scores below the high-risk cut-off who both expressed high perceived risk and interest in PrEP suggesting that demand for PrEP among AGYW may not be well aligned with epidemiologic risk
Mobile clinic/health facility^c	Travill et al. (2018) ³¹ Kenya and South Africa	Conference abstract To assess PrEP uptake and sexual behaviour in the POWER cohort.	<p>Study population: Offered to use PrEP services</p> <p>Sample <i>Sample size (total – N):</i> 330 <i>Gender distribution:</i> Female: 100% <i>Age distribution:</i> Median age: 20.5 years (IQR:19-22)</p>	<p>Nature of Intervention: PrEP was integrated with reproductive health services at family planning clinics (Kisumu, Kenya), an adolescent and youth-friendly clinic (Johannesburg, South Africa [SA]) and a mobile van for reproductive health services for youth (Cape Town, SA)</p> <p>Intervention components: PrEP for AGYW</p>	<ul style="list-style-type: none"> PrEP uptake at the initial visit was 90% across all sites. Two-thirds (68%) did not know their partners' HIV status and only 4% were in a known sero-discordant relationship. Main reasons for declining PrEP were fears of HIV stigma or partner reactions AGYW had evidence of high HIV risk using a risk score, indicating that women initiating PrEP would benefit from it. AGYW had high willingness to initiate PrEP when delivered in these youth-friendly settings.
Hybrid (community-health facility)^c	Ong'wen et al. (2018) ³² Kenya	Conference abstract To know more about adolescent girls accessing	<p>Study population: Offered to use PrEP services</p> <p>Sample <i>Sample size (total – N):</i> 1851 <i>Gender distribution:</i></p>	<p>Nature of Intervention: PrEP integration through drop-in centres (DICEs), public and private clinics</p> <p>Intervention components:</p>	<ul style="list-style-type: none"> Among 28,268 clients initiating PrEP, 1851 (6.5%) were adolescent girls DICEs, clinics designed primarily for sex workers, were the preferred PrEP outlet for adolescent girls, with 66% accessing services in DICEs, 25% accessed

		routine PrEP services in the context of national scale-up programs.	Females: 100% Age distribution: 15-19 years	The adolescents received either static or outreach services from 93 Jilinde supported clinics	PrEP services in public clinics and 9% in private clinics. <ul style="list-style-type: none"> • Entry to PrEP was through peer educators and networks (50%); community outreaches (20%); and within health facilities (30%) • Efforts to make PrEP accessible to AGYW at risk of HIV acquisition should include restructuring the service delivery model
Mobile clinic^c	Rousseau et al. (2019) ³³ South Africa	Conference abstract Hypothesized that contraceptive use was associated with PrEP uptake and continuation in young women accessing sexual and reproductive health services	Study population: Offered to use PrEP services Sample Sample size (total – N): 1096 Gender distribution: Female: 100% Age distribution: 16-25	Nature of Intervention: Contraceptive use associated with PrEP uptake and continuation in AGYW accessing sexual and reproductive health services (SRHS) from a mobile clinic Intervention components: Sexual reproductive health service including HIV testing, contraception (oral, injectable and implant), and PrEP	<ul style="list-style-type: none"> • Among 1096 AGYW who accessed SRHS 31% initiated PrEP on the same day. • AGYW who were using contraception were significantly more likely to initiate PrEP on the same day compared to those who declined PrEP (76% vs 66% on contraception at that visit; p=0.001). • PrEP initiation was also significantly associated with contraception initiation; contraception was initiated by 44% of AGYW on the same day as PrEP initiation compared to 30% contraception starts in AGYW who declined PrEP (p=0.003). • AGYW's contraception use facilitated PrEP initiation and continuation, PrEP initiation also encouraged young women to initiate contraception use supporting the integration of SRHS with the provision of PrEP for AGYW.
Research site	Delany-Moretlwe et al. (2018) ³⁴ South Africa & Tanzania	Conference abstract To evaluate whether empowerment clubs increase PrEP uptake and continuation among AGYW.	Study population: Offered to use PrEP services Sample Sample size (total – N): Female:100% Age distribution: Not mentioned	Nature of Intervention: Participants were randomised to standard of care (SoC), which included comprehensive sexual and reproductive health care, with counselling and SMS reminders for PrEP users, or to empowerment clubs plus SOC. Intervention components: Facilitators-led small group sessions and clinic follow-up visits for sexually active AGYW on PrEP	<ul style="list-style-type: none"> • 431 AGYW enrolled and 213 randomised to clubs • 97% initiated PrEP • PrEP continuation did not vary significantly by study arm (p-value =0.31) • PrEP continuation was 73% at month 1, 61% at month 3 and 34% at month 6. • While PrEP uptake was high in this at-risk population, use diminished with time. Empowerment club participation was low and did not enhance PrEP continuation, contrary to experiences in the HIV treatment field.
Research Site	Donnell et al. (2021) ³⁴	Manuscript To assess the effect of on-site access to	Study population: Offered to use PrEP services Sample	Nature of Intervention: On-site PrEP access at nine trial sites provided by research staff	<ul style="list-style-type: none"> • After on-site PrEP access began 543 (26%) out of 2124 reported PrEP use.

	South Africa	PrEP on HIV incidence.	<p>Sample size (total – N):2121</p> <p>Gender distribution: Female:100%</p> <p>Age distribution: 16-35 years; median age: 23 years (IQR 20-27)</p>	<p>Intervention components: Research nurse provided PrEP</p>	<ul style="list-style-type: none"> • HIV incidence was 2.16% after on-site PrEP access, compared with 4.65% before PrEP access (p=0.0085). • Future studies of HIV prevention should incorporate PrEP as part of the standard of prevention
<p>Hybrid (community-Health facility)</p>	<p>Were et al (2020)³⁵</p> <p>Kenya</p>	<p>Manuscript</p> <p>To describe the programmatic application of an oral PrEP cascade; to quantify progression across each step of the cascade for female sex workers (FSW), MSM and AGYW and, to identify missed opportunities.</p>	<p>Study population: Offered to use PrEP services</p> <p>Sample size (total – N): 299,798</p> <p>Gender distribution: FSW: 211,927, MSM: 47,533 MSM and AGYW: 40,338</p> <p>Age distribution: AGYW: 15-24; FSW >15 years; MSM:>15 years</p>	<p>Nature of Intervention: Scaling up oral PrEP through integration into routine health services in drop-in centres (DICEs), public and private health facilities</p> <p>Intervention components: Individuals enter the PrEP pathway through community mobilization. Individuals who are interested in PrEP are referred to facilities providing PrEP, where they undergo HIV testing services. Clients who screen positive for substantial behavioural risk, or who request PrEP, are referred to an onsite clinician who conducts a clinical assessment and provides PrEP to clients who are eligible and opt-in. Clients are followed-up visit at the same facility one month following initiation and monthly thereafter.</p>	<p>Quantitative:</p> <ul style="list-style-type: none"> • Among PrEP-eligible individuals, 2,900 (11%) AGYW, were initiated on PrEP. Of these clients, whereas 55% of AGYW were between 20 and 24 years. • Majority (81%) of clients-initiated PrEP through DICEs, whereas 14% and 5% were initiated through public and private facilities respectively. • PrEP cascade for AGYW aged 15-19 years: HIV-negative (99%), screened (22%), eligible (36%), initiation (95%), month 1 follow-up (31%), month 3 follow up (5%) • PrEP cascade for AGYW aged 20-24 years: HIV-negative (98%), screened (23%), eligible (34%), initiation (91%), month 1 follow-up (32%), month 3 follow up (5%) • AGYW had higher missed opportunities for screening (78%). Among those screened, a substantially higher proportion of AGYW (65%) were ineligible for PrEP. • Missed opportunities for PrEP initiation was 8% among AGYW. • Majority of AGYW did not persist on PrEP use at month-1 (68%) and month-3 (94%) follow-ups. <p>Qualitative</p> <ul style="list-style-type: none"> • Eligibility for PrEP: Poor rapport between AGYW and providers inhibits disclosure of risk behaviours. Peer mobilization and referral of low-risk individuals coupled with inadequate client education on PrEP. • Initiation of PrEP: Myths and misconceptions about PrEP and low risk perception among FSW, MSM and AGYW. Co-location of both PrEP and

					HIV services in comprehensive care centres (HIV clinics) resulted in PrEP clients feeling stigmatized as HIV positive. Stigma-related discouragement from peers, family and friends for eligible users. Providers reluctance to prescribe PrEP associated with reluctance to increase provider workload; provider belief that client will not adhere to PrEP. Insensitive referral and access pathways in public and private health facilities.
Studies among Men					
Not specified	Bell et al. (2019) ³⁶ South Africa	Conference abstract To understand perceptions of PrEP, and barriers and enablers of uptake among young South African men.	Study population: Never been offered to use PrEP services (hypothetical opinions related to PrEP) Sample Sample size (total – N): 2077 (Quantitative: 2019; Qualitative: 58) Gender distribution: Male: 100% Age distribution: 20-34	Nature of Intervention: Perceptions of PrEP use and barriers and enablers of uptake. 58 IDIs Intervention components: N/A	<ul style="list-style-type: none"> • Enablers to PrEP use: <ul style="list-style-type: none"> - Maintain an HIV-negative status - Avoid conflict and turmoil that HIV diagnosis would bring - High degree of enthusiasm towards the concept • Barriers to PrEP use: <ul style="list-style-type: none"> - Practical: remembering to take the pill daily, side effects and access to clinics. - Knowledge: Had basic information, confused PrEP with PEP - Psychological: perceived as "only for women" and health seeking behaviour is not the norm for men. - Social: Being seen at clinics by community members, as people will assume that they are HIV positive. - Interpersonal: Keep PrEP use a secret from their partners, friends and family.
Studies among AGYW and Men					
Hybrid (research site- health facility)^e	Heffron et al. (2018) ³⁷ Kenya and Uganda	Manuscript To explore fertility intentions, pregnancy, and evaluated the use of PrEP and ART as peri-conception HIV risk reduction strategies.	Study population: Offered to use PrEP services Sample Sample size (total – N): 1013 Gender distribution: HIV-infected females: 455; HIV-uninfected males: 224; HIV infected males: 110; HIV-uninfected females: 224 Age distribution:	Nature of Intervention: The PrEP delivery model integrated PrEP into HIV treatment services. PrEP discontinuation was encouraged once the HIV-infected partner had used ART for at least 6 months (time to achieve HIV viral suppression). Intervention components: Couples-based HIV prevention counselling; safer conception	<ul style="list-style-type: none"> • Uptake and adherence to integrated PrEP and ART strategy was high with an estimated 96% reduction in HIV incidence. • During the 6 months preceding pregnancy, 82.9% of couples used PrEP or ART and there were no HIV seroconversions, 14.5% used some ART and/or PrEP and 2.6% used neither PrEP nor ART. • Among the 81 couples who were using ART only (61 couples with HIV-infected women and 20 with HIV-infected men), 91.2% of the HIV-uninfected partners had discontinued PrEP due to sustained

			HIV-infected females: 26 (22-30); HIV-uninfected males: 30 (26-37); HIV-uninfected females: 29 (24-35); HIV-infected males: 35 (30-42)	counselling or contraceptives; counselling and HIV testing for HIV-uninfected partner; PrEP initiation/prescription and adherence counselling; referral of HIV infected partner for ART	(i.e., [6 months) ART use by their HIV infected partner. <ul style="list-style-type: none"> • Integrated PrEP and ART was readily used by HIV serodiscordant couples. • Widespread scale-up of safer conception counselling and services is warranted to respond to strong desires for pregnancy among HIV-affected men and women.
Hybrid (research site- health facility)^e	Ngure et al. (2016) ³⁸ Kenya	Manuscript To gather insights into couples' decision-making, motivations for PrEP uptake, and experiences soon after PrEP initiation.	Study population: Offered to use PrEP services Sample Sample size (total – N): 40 Gender distribution: Female: 20; Male:20 Age distribution: Females: 29.1 (20-43), Males: 36.6 (27-57)	Nature of Intervention: The PrEP delivery model integrated PrEP into HIV treatment services. PrEP discontinuation was encouraged once the HIV-infected partner had used ART for at least 6 months (time to achieve HIV viral suppression). Intervention components: At the time of interview: time since initiating PrEP was 6.3 months and time since initiating ART was 5.6 months	<ul style="list-style-type: none"> • PrEP offered couples an additional strategy to reduce the risk of HIV transmission, meet their fertility desires, and cope with HIV serodiscordance. • Remaining HIV-negative at follow-up visits reinforced couples' decisions and motivated continued adherence to PrEP. Daily PrEP use supported the HIV-infected partners adherence to ART. • A positive clinical encounter (provider's advice and client-friendly services) motivated initiation and continuation of PrEP
Hybrid (community-health facility)^d	Koss et al. (2018) ³⁹ Kenya and Uganda	Manuscript To report on "early adopters" of PrEP in the Sustainable East Africa Research in Community Health (SEARCH) study in rural Uganda and Kenya. intervention.	Study population: Offered to use PrEP services Sample Population: AGYW Men Sample size (total – N): 4064 Gender distribution: 1934 females 2130 males 48% females 52% males Age distribution:	Nature of Intervention: PrEP education and discussions occurred on arrival at the health campaign, with HIV counsellors and clinicians. During home-based testing, 1 staff member conducted HIV testing and counselling and provided info about PrEP. Intervention components: 1-month community mobilization and sensitization activities on PrEP. PrEP risk score or was administered. Hybrid HIV and multi-disease testing was conducted (health campaigns & home-based) with counselling and health education discussions on PrEP.	<ul style="list-style-type: none"> • Of 21 212 HIV-uninfected adults, 4064 were identified for PrEP (2991 by empiric risk score, 1073 by self-identified risk). • 739 individuals started PrEP within 30 days; 77% on the same day. • Among adults identified by risk score, predictors of early adoption included male sex (adjusted odds ratio 1.53; 95% confidence interval, 1.09-2.15), polygamy (1.92; 1.27-2.90), serodiscordant spouse (3.89; 1.18-12.76), self-perceived HIV risk (1.66; 1.28-2.14), and testing at health campaign versus home (5.24; 3.33-8.26). • Among individuals who self-identified for PrEP, predictors of early adoption included older age (2.30; 1.29-4.08) and serodiscordance (2.61; 1.01-6.76).

<p>Hybrid (community-health facility)^d</p>	<p>Koss et al. (2020)⁴⁰</p> <p>Kenya and Uganda</p>	<p>Manuscript</p> <p>To assess PrEP uptake and engagement after population-level HIV testing and universal PrEP access to characterise gaps in the PrEP cascade</p>	<p>Study population: Offered to use PrEP services</p> <p>Sample</p> <p>Sample size (total – N): 12935 (HIV-negative with elevated risk)</p> <p>Gender distribution: Female: 6459; Male: 6476</p> <p>Age distribution: 15-24: 4800; 25-34: 4712; 35-44: 1927; 45-54: 991; ≥55: 505</p>	<p>Nature of Intervention: Population-level HIV and multi-disease testing using a hybrid mobile testing approach at community health fairs, home-based testing or facilities. PrEP initiation at health fairs or at local clinic.</p> <p>Intervention components:</p> <p>Community: community sensitisation, HIV testing, PrEP counselling to HIV- negative people at elevated risk (serodifferent partnership, risk score, or self-identified risk); on-site PrEP start at health fairs or same-day PrEP initiation at local clinics. Home: home-based testing and PrEP counselling, offer of PrEP through local clinics.</p> <p>Local clinic: Patients with HIV were asked to bring their HIV-negative or partners with unknown HIV status to the clinic for HIV testing and the offer of PrEP initiation.</p> <p>Follow up: visits included supportive delivery system with options for visits at clinic, home, or community locations. Follow up visits included: HCT, PrEP refill blood tests and adherence measurements</p>	<ul style="list-style-type: none"> • In 12935 (10% serodifferent partnership, 54% risk score, 36% self-identified risk) people at elevated risk, 27% initiated PrEP. • 82% initiated PrEP on the same day as HIV testing, 50% of whom were men • 19% of AGYW (15-24 years) initiated PrEP • PrEP uptake was lower among individuals aged 15-24 years and mobile individuals. • At week 4, 64% were engaged in the programme, 49% received medication refills, and 40% self-reported adherence. • At week 72, 56% were engaged, 33% received a refill, and 27% self-reported adherence. • Inclusive risk assessment (combining serodifferent partnership, an empirical risk score, and self-identification of HIV risk) was feasible and identified individuals who could benefit from PrEP. • The biggest gap in the PrEP cascade was PrEP uptake, particularly for young and mobile individuals. •
<p>Hybrid (community-health facility)^d</p>	<p>Mayer et al. (2019)⁴¹</p> <p>Uganda</p>	<p>Manuscript</p> <p>To estimate the association between distance to clinic and other transportation-related barriers on PrEP uptake and initial clinic visit</p>	<p>Study population: Offered to use PrEP services</p> <p>Sample</p> <p>Sample size (total – N): 701</p> <p>Gender distribution: Female: 300; Male: 401</p> <p>Age distribution: 15-24: 339; 25-34: 242;</p>	<p>Nature of Intervention: PrEP was given using a hybrid model and initiation was dependent on participant choice. PrEP could be initiated same day on-site at community health fairs or at local clinic). For those tested at home PrEP was offered within one to six months following the community campaign through local clinics.</p>	<ul style="list-style-type: none"> • Of the 701 PrEP-eligible participants, 39% started PrEP within four weeks; of these, 17% were retained at four weeks. • Participants with a distance to clinic of ≥2 km were less likely to start PrEP (p = 0.012) and less likely to be retained on PrEP once initiated (p = 0.024) • Eligible participants (from home-based testing) who did not have the option of same-day PrEP initiation were also less likely to initiate PrEP (p < 0.001).

			35-44:77; 45-54: 991; ≥45: 43	Intervention components: Meetings with community stakeholders to sensitise them on PrEP, at community health campaigns (CHCs), eligible HIV-negative participants at elevated risk (serodifferent partnership, risk score, or self-identified risk) were directed to a PrEP education station where they were informed about how PrEP works, interested participants were offered referral to a linkage station to make an appointment at clinic for PrEP enrolment or same-day PrEP start or a clinic appointment at a later date.	<ul style="list-style-type: none"> Barriers to PrEP use: daily use of PrEP, "low/no risk of getting HIV, transportation-related barriers (clinic is too far away and travel away from home).
Hybrid (community-health facility)^d	Camlin et al. (2020) ⁴² Kenya and Uganda	Manuscript To explore understandings of PrEP, elucidate factors influential of demand, decisions around PrEP uptake or non-initiation, and adherence and discontinuation in population subgroups at elevated HIV risk.	Study population: Offered to use PrEP services Sample Sample size (total – N): 111 Gender distribution: Females: 65; Males: 46 Age distribution: 15-35, median age: 24 (range 17-35)	Nature of Intervention: Same day PrEP initiation on-site at community health campaigns or at health facilities. 8 FGDs (4 male, 4 female groups) each with 8-12 participants; 13 IDIs with PrEP initiators and 10 IDIs with PrEP decliners Intervention components: As per SEARCH study: Same day initiation of PrEP on-site at community health campaigns or health facilities. Transport to clinics for the PrEP initiation visit. Follow-up visits which occurred at local health facilities, participants' homes, or other community-based locations of the participant's choice.	<ul style="list-style-type: none"> Gendered motivations for PrEP: young men viewed PrEP as a means to safely pursue multiple partners, while young women saw PrEP as a means to control risks in terms of engagement in transactional sex and difficulty in negotiating condom use and partner testing. Uptake was hindered by HIV/ART-related stigma (colour of pill same as ART, accessing PrEP at the same facility where HIV care was provided), the need for partners permission, distance to facilities, mixed messaging on the dosing of PrEP, taking daily medications, living with parents or were attending school, moral prohibitions against sex among young people, desire for "proof" of efficacy by peers Uptake was motivated by high perceived HIV risk, and beliefs that PrEP use supported life goals (completing schooling or having a family). Discontinuation of PrEP was due to dissolution of partnerships/changing risk, unsupportive partners/peers, or early side effects/pill burden.
Hybrid (community)	Koss et al. (2017) ⁴³	Conference abstract	Study population: Offered to use PrEP services (nested in SEARCH Trial)	Nature of Intervention: This is a cross sectional study based on SEARCH trial	<ul style="list-style-type: none"> In communities that were offered targeted PrEP in this population-based study, multi-level barriers to the uptake of PrEP were identified.

y-health facility ^d	Kenya and Uganda	To evaluate barriers to the uptake of open-label PrEP offered in a population-based context in high HIV prevalence settings.	Sample Population: Men. Women and youth Sample size (total – N): 63 Community members: 40% men; 35% women; 25% youth 42 Clients who did not initiate PrEP: 38% women; 45% at risk for HIV by empiric score Gender distribution: 16-53 years, median age of 28 years Age distribution: 40% men, 35% women, 25% youth	Intervention components: n/a Intervention delivery setting: n/a	<ul style="list-style-type: none"> - In addition to barriers identified in prior studies of targeted populations, such as aspects of pill-taking, concerns about effectiveness, and partner and household--level influence, concerns about access to PrEP via health facilities or at school, opportunity costs, mobility, and misconceptions about PrEP as barriers to uptake in SEARCH communities. • Strategies are needed to address these barriers, such as community sensitization, expanded provision of information on PrEP, and community--based delivery mechanisms to facilitate access to PrEP.
Hybrid (community-health facility)	Gombe et al. (2020) ⁴⁴ Zimbabwe	Manuscript To understand the factors that motivate clients to accept, decline, continue, or discontinue PrEP.	Study population: Offered to use PrEP services Sample Sample size (total – N): 60 Gender distribution: Female: 46; Male: 14 Age distribution: 16-25: 20%; 26-40: 60%; >41: 20%	Nature of Intervention: PrEP was integrated at two family planning clinics. 54 IDIs with PrEP acceptors and 6 IDIs with PrEP decliners Intervention components: HIV testing; screening for PrEP eligibility according to a tool; same day initiation of PrEP (one-month supply); follow-up visit at month 1 (three-month supply)	<ul style="list-style-type: none"> • Motivators to accept PrEP: High HIV risk perception, preference for PrEP over other HIV prevention methods, perceived severity of living with HIV, confidence in PrEP • Barriers to accepting PrEP: fear of pill burden or impact of pills, wanting partners consent or fearing partner reaction to PrEP, feeling satisfied with current method of HIV prevention • Motivators to continue PrEP: focus on original motivation, establishing daily pill routine, accessible PrEP pill storage, planning ahead before travelling out of town, partner or facility support - Barriers to continuing PrEP: being unaccustomed to taking pills, religious issues, travel out of town, clinic schedule/hours, lack of transport funds, misunderstanding dosing guidance, side effects
Health facility	Sack et al (2020) ⁵¹ Mozambique	Manuscript To explore the perspectives, attitudes, and experiences of HIV serodiscordant partners taking	Study population: Offered to use PrEP services Sample Sample size (total – N): 20 Gender distribution: Female: 11; Male: 9 Age distribution: Median age 35, interquartile range	Nature of Intervention: Stories will be presented to discordant couples to try to improve PrEP uptake and reduce incident HIV infections. Intervention components: Three oral stories designed to educate, empower, and normalize PrEP use.	<ul style="list-style-type: none"> • Individual factors influencing PrEP uptake and adherence: love for one's partner, knowledge about PrEP and the belief it is effective, fear of HIV and PrEP stigma • Interpersonal factors affecting PrEP uptake: desire to protect family, partner support and relationship

		PrEP and develop a messaging campaign to improve PrEP uptake in rural Mozambique to reduce HIV transmission among serodiscordant partners.	26.5-37.5). Female: median age 32, interquartile range 25.5-36; male: median age 36, interquartile range 31-38.		strength, Overcoming the fear of stigma to seek support from family and friends
Community	Bassett et al. (2018) ⁴⁵ South Africa	Manuscript To assess the acceptability and feasibility of offering family planning and HIV prevention services at salons.	Study population: Never been offered to use PrEP services (hypothetical opinions related to PrEP) Sample Population: 17 hair salons, 92 stylists, 326 clients Sample size (total – N): Salons (N = 17), Owners (N = 17), Stylists (N = 92), Female clients (N = 326) Gender distribution: 100% of salon clients were female 82% of stylists were female 65% of owners were female Age distribution: Median age (IQR): Salon clients: 28 (IQR 24 to 33); Stylists: 29 (26-32) Owners: 36 (33-43)	Nature of Intervention: n/a Intervention components: n/a Intervention delivery setting: n/a	<ul style="list-style-type: none"> Overall, most owners, stylists, and clients were willing to receive contraception and PrEP from a nurse in hair salons in and around Umlazi Township. Frequent client visits and willingness of stylists to offer health education suggest that a stylist initiated, nurse-supported health intervention could be feasible in the salon setting. Hair salons represent a promising venue for reaching young women in sub-Saharan Africa at risk of unintended pregnancy and HIV infection.
Community	Bassett et al. (2019) ⁴⁶ South Africa	Manuscript To assess the acceptability of nurse-offered contraceptive and PrEP services at	Study population: Never been offered to use PrEP services (hypothetical opinions related to PrEP) Sample Population:	Nature of Intervention: n/a Intervention components: n/a Intervention delivery setting: n/a	<ul style="list-style-type: none"> Participants felt that incentives would be beneficial to program enrolment, if not necessary, to garner interest among clients. One client noted that incentives have become an expected part of research Overall, participants liked the idea of receiving personal SMS messages and having WhatsApp

		hair salons in Durban, South Africa.	<p>Clients of hair salons- Females, mean age 27 years, hair salon owners, hair stylists</p> <p>Sample size (total – N): Clients=42 (all female) Stylists=43 (40 female; 3 male) Salon owners=10 (8 female; 2 male)</p> <p>Gender distribution: Clients: 42 Females Stylists: 40 Females; 3 Males Owners: 8 Females; 2 Males</p> <p>Age distribution: Clients: M=27.1; SD=6.3 Stylists: M=29.6; SD=5.1 Owners: M=40.3; SD; 7.6</p>		<p>groups as adherence supports. Clients preferred SMS messages for direct adherence motivation because they are more private.</p> <ul style="list-style-type: none"> • One client felt that an SMS could also serve as an automated daily reminder for women on PrEP to take their medication. A few participants also noted that SMS would be more accessible than WhatsApp given data constraints. • Overall, participants were enthusiastic about the program. Convenience and a conducive environment were noted as facilitators to receiving health services in the hair salon; attention will have to be directed to establishing privacy and program legitimacy. • Hair salons represent an innovative venue for reaching young women at high-risk for unintended pregnancy and HIV infection.
Community	Lubwama et al. (2019) ⁴⁷ Uganda	<p>Conference abstract</p> <p>A review of PrEP data from PEPFAR Data for Transparency Impact Monitoring (DATIM) for July 2017 to June 2018</p>	<p>Study population: Offered to use PrEP services</p> <p>Sample Population: Key populations including sex workers (SW), men who have sex with men (MSM), transgender persons (TG) and other high-risk groups (fisher folk [FF], discordant couples [DC], truckers, adolescent girls and young women [AGYW] and people who inject drugs).</p> <p>Sample size (total – N): Initiated PrEP (6 sites) 3,846 PrEP clients (1 community): 1538</p> <p>Gender distribution: Not mentioned</p> <p>Age distribution: Not mentioned</p>	<p>Intervention components: Drop-in centres (DINCs), Community based outreach centres</p>	<ul style="list-style-type: none"> • 3,846 individuals-initiated PrEP; 2,568 (67.2%) SW, 327 (8.5%) MSM, 15 (0.4%) TG, and 918 (23.8%) other high-risk groups • One community had 1538 PrEP clients: 58.1% SW, 25.4% FF, 7.4% DC and 0.5% MSM. • Return rates for PrEP were higher among DC (3 months:56.9%, 6 months:46.8%) and low among SW (3 months 37.5%, 6 months 26.3%) and FF (3months 16.4%, 6months 14.2%). • The majority (69.2%, 1064/1538) were reached through outreach models versus fixed public health facilities • More SW than other KP and high-risk groups were reached with PrEP. Retention at 3 and 6 months was low for sex workers and fisherfolk, somewhat higher for discordant couples. • Outreach approaches should be scaled up to reach more KP clients with PrEP. Retention strategies should be strengthened, especially for sex workers and fisherfolk, who may be highly mobile.

<p>Community</p>	<p>Morton et al (2020)⁴⁸</p> <p>South Africa</p>	<p>Manuscript</p> <p>To understand how to effectively create awareness, stimulate interest, and increase uptake of PrEP.</p>	<p>Study population: Never been offered to use PrEP services (hypothetical opinions related to PrEP)</p> <p>Sample Sample size (total – N): 385 Quantitative: 320 Qualitative: 28 key stakeholders; 11 PrEP-naïve young, 10 PrEP-experienced women, five older women living with HIV, four men, seven key informants</p> <p>Gender distribution: Female 100% in household surveys</p> <p>Age distribution: Quantitative: 20 (18, 23) Qualitative: PrEP-naïve young women (aged 16-25), PrEP-experienced women (aged 16-29), older women living with HIV (aged 26-32), men (aged 25-35)</p>	<p>Nature of Intervention: Young women were shown a 90-second PrEP demand creation video and two informational brochures and then asked to self-administer a short survey that included questions on demographics, sexual relationships, risk taking, HIV risk perception, PrEP interest and knowledge, and their opinions about the video..</p> <p>Intervention components: Research staff visited houses up to three times, requesting to speak with the young woman household resident. Young women who agreed to participate were shown the video and then asked to self-administer a short survey.</p>	<p>Quantitative</p> <ul style="list-style-type: none"> • Most reported interest in learning more about PrEP (67.7% 'definitely interested' and 9.4% 'somewhat interested') and taking PrEP (56.4% 'definitely interested' and 12.5% 'somewhat interested'). • Factors significantly associated with interest in taking PrEP were having a primary partner with whom they regularly have sex (80.0% vs. 65.2% without a primary partner; adjusted odds ratio (AOR)=3.1, 95% CI: 1.3, 7.0) and being in a sexual partnership for <6 months (86.8% vs. 68.5% for >12 months; AOR=3.0, 95% CI: 1.2, 7.3).
<p>Research site</p>	<p>Heffron et al. (2018)⁴⁹</p> <p>East Africa</p>	<p>Manuscript</p> <p>To present estimates of effectiveness and patterns of PrEP use within a two-year demonstration project of PrEP for HIV- negative members of heterosexual HIV serodiscordant couples in East Africa.</p>	<p>Study population: Offered to use PrEP services</p> <p>Sample Population: Serodiscordant couples Sample size (total – N): 1010 couples Gender distribution: Males: 1010 Females 1010 Age distribution: HIV-: Age, years 30 (26, 36) HIV+: Age, years 28 (23, 35)</p>	<p>Nature of Intervention: PrEP was offered at enrolment at research site to all HIV-negative participants as PrEP with a daily dosing schedule; participants electing not to initiate PrEP at enrolment were offered PrEP initiation at subsequent visits</p> <p>Intervention components: N/A</p> <p>Intervention delivery setting: Research site</p>	<ul style="list-style-type: none"> • 97% of HIV-negative partners-initiated PrEP. • Median duration of PrEP use was 12 months (IQR 6-18) • Adherence: 71% of HIV-negative participants took ≥80% of expected doses • 95% reduction (95% CI 86-98%, p<0.0001) in HIV incidence, relative to estimated HIV incidence for the population in the absence of PrEP integrated into HIV treatment services.

Research site^e Ware et al. (2018) ⁵⁰ Uganda	Manuscript To evaluate the integrated strategy of delivering PrEP & ART to find out why it was successful.	Study population: Offered to use PrEP services Sample <i>Sample size (total – N):</i> 93 couples Gender distribution: Female HIV-uninfected partner: (46%) Age distribution: HIV uninfected partner: 31 (26 to 37) HIV infected partner 31 (25 to 37)	Nature of Intervention: The integrated strategy offered time-limited PrEP to uninfected partners as a "bridge" to long-term ART in the infected partner. Uninfected partners were offered PrEP at baseline and encouraged to discontinue once infected partners had used ART for six months. Intervention components: PrEP was integrated with ART	<ul style="list-style-type: none"> • Couples viewed in services as hope for staying together, attending joint follow up appointments together increased mutual support, and travelling and waiting room time provided an opportunity for discussion, reflection and joint decision making. • Concern for partner wellbeing was a reason for initiating ART whilst the simultaneous use of ARVs turned management of HIV into a shared experience • Couples devised joint strategies for adhering to PrEP and ART such as mutual reminders and emotional and material support for adherence.
Research site Atujuna et al. (2018) ⁵¹ South Africa	Manuscript To explore acceptability and preferences for New biomedical prevention technologies (NPTs) among key and other vulnerable populations in two South African townships.	Study population: Never been offered to use PrEP services (hypothetical opinions related to PrEP) Sample <i>Sample size (total – N)</i> Adolescents=14 Gender distribution: Heterosexual women=10 Heterosexual men=9	Nature of Intervention: n/a Intervention components: n/a Intervention delivery setting: n/a	<ul style="list-style-type: none"> • Different product preferences and motivations emerged by population based on similarity to existing practices and contexts of vulnerability. • Adult women and female adolescents preferred a vaginal ring and HIV vaccine, motivated by longer duration of protection to mitigate feared repercussions from male partners, including threats to their marriage and safety, and a context of ubiquitous rape. • Male adolescents preferred an HIV vaccine, seen as protection in serodiscordant relationships and convenient in obviating the HIV stigma and cost involved in buying condoms. • Adult men preferred PrEP, given familiarity with oral medications and mistrust of injections, seen as enabling serodiscordant couples to have a child.
Research site^e Baeten et al. (2016) ⁵² Kenya and Uganda	Manuscript To understand the delivery feasibility and uptake of, as well as adherence to, an integrated package of ART and PrEP among high-risk heterosexual HIV-	Study population: Offered to use PrEP services Sample <i>Sample size (total – N)</i> 1013 serodiscordant couples Gender distribution: HIV-1-uninfected partner Male: 679 (67%) Age distribution: HIV-1-uninfected partner Age <25 y=207 (20%),	Nature of Intervention: HIV- partners were offered PrEP which was provided at the study sites, as PrEP was not available otherwise in Kenya and Uganda during the study period. ART was offered at the study site or by referral to another HIV-1 care center of their choice Intervention components:	<ul style="list-style-type: none"> • ART was initiated by 789 (78%) HIV-1-infected partners. • 960/1 013 (95%) HIV-uninfected partners-initiated PrEP at enrolment, and 2% initiated PrEP at a later visit. • Among those initiating PrEP at enrolment and attending the month 1 and 3 visits, 840 (97%) and 792 (94%) continued to receive PrEP. • Adherence to PrEP measured by pill counts of returned, unused pills, indicated that 95% of

		1-serodiscordant couples	HIV-1-infected partner Age <25 y= 317 (31%)	<ul style="list-style-type: none"> - Couples were offered antiretroviral medications - Counselling on HIV-1 prevention benefits PrEP discontinued 6 months after the infected partner initiated antiretroviral treatment	dispensed pills had been taken as expected and 88% of periods between study visits had adherence >80%. <ul style="list-style-type: none"> • 14 initially HIV-1-seronegative partners seroconverted during follow-up (12 were infected at the time of study enrolment).
Research site	Heffron et al. (2019) ⁵³ Kenya	Manuscript To determine uptake, use and effectiveness of a comprehensive safer conception intervention among HIV-serodiscordant couples with immediate fertility desires.	Study population: Offered to use PrEP services Sample Population: Serodiscordant couples Sample size (total – N): 74 Gender distribution: HIV-negative females/HIV positive males= 54%	Nature of Intervention: Couples attended monthly visits at the study clinic prior to pregnancy and quarterly visits during pregnancy. Couples were followed for 12 months or until the end of pregnancy. During all visits, couples received counselling about HIV prevention, information about how to track women's menstrual cycles and identify peak fertility days and how to conduct vaginal self-insemination Intervention components: The intervention package included antiretroviral therapy (ART) for HIV-positive partners, oral pre-exposure prophylaxis (PrEP) for HIV-negative partners, daily fertility and sexual behaviour tracking via short message service (SMS) surveys, counselling on self-insemination, and referrals for voluntary medical male circumcision and fertility care.	<ul style="list-style-type: none"> • Of the 74 enrolled couples, 54% were HIV-negative female/HIV-positive male couples. • Prior to pregnancy, 100% of partners living with HIV used ART and 100% of HIV-negative partners-initiated PrEP. • One-month preceding pregnancy, 80.9% of HIV-positive partners were virally suppressed and 81.4% of HIV-negative partners were highly adherent to PrEP. • 42.6% pregnancies were protected using all four strategies i.e., men were circumcised, high adherence to PrEP, ART and timed condomless sex. • In addition to male circumcision, seven pregnancies (14.9%) were also protected by high adherence to PrEP and ART, 5 (10.6%) were protected by PrEP and timed condomless sex. • 0 HIV seroconversions (95% CI 0.0 to 6.0 per 100-person years) were observed indicating a 100% reduction in HIV risk (p = 0.04).
Research Site	Minnis et al (2020) ⁵⁴ South Africa	Manuscript Examined youths' preferences for key attributes of long-acting PrEP, with a focus on characteristics pertinent to product	Study population: Never been offered to use PrEP services (hypothetical opinions related to PrEP) Sample Sample size (total – N): 807 Gender distribution: Female: 401 (50%);	Nature of Intervention: Participants were asked to choose between two hypothetical PrEP products composed of five attributes product form (injection, implant); dosing frequency (two, six or twelve months); where to obtain the product (clinic, pharmacy, community distribution, mobile clinic - all	<ul style="list-style-type: none"> • All three subgroups had strong preference for a product with a one-year duration over two months (p < 0.001). • MSW placed the most importance on dosing frequency, with it being five times more important than any other attribute. • Females had greater preference for a single injection over an implant compared to MSW (p ≤ 0.004).

		delivery alongside key modifiable product attributes.	Men who have sex with women only (MSW): 216 (27%). Men who have sex with men MSM): 190 (23%) Age distribution: Median age (IQR): Female: 21 (19 to 22); men who have sex with women only: 21 (19 to 22) men who have sex with men: 20 (19 to 22)	models for current HIV prevention and contraceptive service delivery); pain involved with injection or insertion (mild, moderate) and delivery location on the body (arm, buttock, thigh). Intervention components: Participants completed interviews on a tablet computer. The survey first introduced each attribute individually with both visual and narrative descriptions. Participants were then presented with nine DCE choice questions, each one a unique choice NB: PrEP was not provided in this study.	<ul style="list-style-type: none"> • Females and MSW expressed more preference for two injections compared with implants ($p \leq 0.009$). • Females preferred using a product that was offered at a health clinic over accessing it at a pharmacy ($p < 0.001$). • All youth preferred product insertion in the arm ($p < 0.001$). • Females disliked insertion in the thigh and both MSW and MSM disliked insertion on the buttocks ($p = 0.01$). • Youth indicated strong preferences for longer duration products. <p>Each attribute nonetheless influenced preferences, offering insight into trade-offs that inform long-acting PrEP development.</p>
Other					
Not described	Jani et al. (2018) ⁵⁵ Tanzania	Conference abstract To describe support for PrEP use among male partners of AGYW in Tanzania via a qualitative comparative analysis of AGYW's and male partners of AGYW's views	Study population: Never been offered to use PrEP services (hypothetical opinions related to PrEP) Sample Sample size (total – N): not described Gender distribution: not described Age distribution: not described	Nature of Intervention: Prior to IDIs and FGDs participants were acquainted with PrEP, by sharing a visual, standardized script of PrEP information with them. 24 IDIs and 4 FGDs with AGYW; 16 IDIs with men Intervention components: PrEP for AGYW	<ul style="list-style-type: none"> • AGYW and male partners agreed that most male partners would be willing to support PrEP use by AGYW. • However, male partner support might be contingent on their early involvement in the decision-making process regarding PrEP. • Early inclusion was perceived to remove suspicion of infidelity and alleviate negative consequences associated with late or inadvertent disclosure of PrEP use. • AGYW suggested potential social harms (relationship dissolution, loss of financial support, and verbal and physical violence) if male partners are not involved whilst male partners denied such potential extreme consequences. • Male participants recommended strategies on gaining men's support of PrEP including providing education to men on PrEP, equipping AGYW with skills to educate their partners, couples counselling by providers, provision of PrEP for men, and community education and sensitization.

					<ul style="list-style-type: none"> Educating male partners about PrEP and engaging them in implementation activities should be part of PrEP roll-out strategies for AGYW.
Not described	Makyao et al. (2018) ⁵⁶ Tanzania	Conference abstract To explore how social norms and gendered parenting roles might influence parental support of AGYW's PrEP use.	Study population: Never been offered to use PrEP services (hypothetical opinions related to PrEP) Sample Sample size (total – N): 55 Gender distribution: Female parents: 28; Male parents: 27 Age distribution: not described	Nature of Intervention: Prior to IDIs and FGDs participants were acquainted with PrEP, by sharing a visual, standardized script of PrEP information with them. 4 FGDs with male parents and 4 FGDs with female parents Intervention components: PrEP for AGYW	<ul style="list-style-type: none"> Parents supported PrEP availability recognizing AGYW's high risk of HIV due to limited power to negotiate preventative behaviours and frequent violence in sexual relationships. Differential parenting roles influenced the type of support. Men noted shame and embarrassment in communicating with their daughters about relationships and sex. Social norms around adolescent sexuality influenced parental support. Parents were wary of being viewed as condoning pre-marital sexual activity, while they worried that AGYW could be stigmatized as promiscuous. Parents recommended strategies for supporting their daughters PrEP use included: creating a supportive environment for PrEP use (e.g., ensuring good diet) while male parents described offering logistical and material support (e.g., providing transport to health centres).
n/a (modelling)	Cremin et al. (2015) ⁵⁷ Mozambique	Manuscript The aim of this paper is to estimate the prevention impact and the cost effectiveness of providing time-limited PrEP to partners of migrant miners in Gaza, Mozambique.	Study population: Never been offered to use PrEP services (hypothetical opinions related to PrEP) Sample Population: adult heterosexual Sample size (total – N): Note mentioned (modelling) Gender distribution: N/A Age distribution: N/A	Nature of Intervention: n/a Intervention components: n/a Intervention delivery setting: n/a	<ul style="list-style-type: none"> Providing time-limited PrEP to partners of migrant miners in Gaza Province during periods of increased exposure would be a novel strategy for providing PrEP. This strategy would allow for a better prioritized intervention, with the potential to improve the efficiency of a PrEP intervention considerably, as well as providing important reproductive health benefits
n/a Modelling	Irungu et al. (2019) ⁵⁸ Kenya	Manuscript To provide estimates of the cost of delivering	Study population: Never been offered to use PrEP services (hypothetical opinions related to PrEP) Sample	Nature of Intervention: n/a Intervention components: n/a	<ul style="list-style-type: none"> Time-limited provision of PrEP to the HIV uninfected partner within HIV serodiscordant couples can be an affordable delivery model implemented in HIV care programs in Kenya and

		antiretroviral-based HIV prevention to HIV serodiscordant couples in public health facilities in Kenya and the incremental cost of providing PrEP as a component of this strategy.	<p>Population: Heterosexual couples</p> <p>Sample size (total – N): N/A</p> <p>Gender distribution: none provided</p> <p>Age distribution: No age disaggregation</p>		similar settings. These costs can be used for budgetary planning and cost effectiveness analyses.
n/a Modelling^e	Ngure et al. (2020) ³⁰ Kenya and Uganda	Manuscript To estimate the associations between effective contraceptive use and 1) PrEP dispensation 2) high effective PrEP use	<p>Study population: Offered to use PrEP services</p> <p>Sample Population: Sample size (total – N): 311</p> <p>Gender distribution: Female: 100%</p> <p>Age distribution: Median age: 29 years ([IQR] 24.0-35.0)</p>	<p>Nature of Intervention: HIV-uninfected women were provided with both PrEP and effective contraception</p> <p>Intervention components: PrEP was integrated with ART</p>	<ul style="list-style-type: none"> • PrEP dispensation was more frequent among those concurrently using effective contraception, (adjusted relative risk [aRR]=1.19; 95% confidence interval [CI]=1.08-1.32) and contraceptive use was more common among those on PrEP (aRR=1.63; 95% CI=1.18-2.25). • Healthcare delivery models that integrate the provision of family planning and PrEP may successfully promote both preventive products, especially long-acting contraception

a. Conducted in the context of the Girl Power study b. Conducted in the context of the PrEP Implementation in Young Women and Adolescents (PrYA) study c. Conducted in the context of the Prevention Option for Women Evaluation Research (POWER) project d. Conducted in the context of the Sustainable East Africa *Research* in Community Health (SEARCH) study e. Implemented within The Partners Demonstration Project

Author	Item										11
	1	2	3	4	5	6	7	8	9	10	
Qualitative studies using the CASP Tool ²²											
Atujuna et al., 2018 ⁵¹	+	+	+	+	+	+	+	+	+	+	
Bassett et al., 2019 ⁴⁶	+	+	+	?	+	?	+	+	+	+	
Bell et al., 2019 ^{36*}	+	+	+	?	?	-	-	?	-	?	
Camlin et al., 2020 ⁴²	+	+	+	+	+	+	+	+	+	+	
Gombe et al., 2020 ⁴⁴	+	+	?	?	+	+	+	+	+	+	
Jani et al., ⁵⁵	+	+	+	?	?	-	?	?	+	?	
Makyao et al., ⁵⁶	+	+	+	?	?	-	-	?	?	?	
Maseko et al., ²⁵	+	?	-	-	+	?	-	+	?	?	
Ngure et al., 2016 ³⁸	+	+	+	+	+	+	+	+	+	+	
Pintye et al., 2019 ²⁹	+	+	+	?	+	?	?	?	+	+	
Ware et al., 2018 ⁵⁰	+	+	+	+	+	?	+	?	?	?	
Morton et al., 2020 ^{48*}	+	+	+	+	+	-	+	?	+	+	
Were et al., 2020 ^{35*}	+	+	+	+	+	+	+	+	+	+	
Sack et al., 2021 ⁵¹	+	+	+	+	+	+	+	+	+	+	
Comparative studies including randomised trials, nonrandomised trials, interrupted time series and controlled-before after studies using the EPOC tool ²¹											
Delany-Moretlwe et al., 2018 ³⁴	?	?	+	?	?	?	?	?	?		
Koss et al., 2018 ³⁹	-	?	+	+	?	+	+	+	+		
Donnell et al., 2021 ³⁴	?	?	+	+	?	?	?	+	+		
Studies involving descriptions of interventions, implementation or policy processes with very limited empirical data and other non-conventional sources using the WEIRD tool ²³											
Baetan et al., 2016 ⁵²	+	+	+	!	+	N/A	!	+	+	+	+
Bassett et al., 2018 ⁴⁵	+	+	?	+	+	+	?	+	+	+	+
Bell et al., 2019 ^{36*}	!	-	-	?	?	?	?	-	?	-	-
Heffron et al., 2018 ⁴⁹	+	?	!	?	?	+	?	+	+	+	+
Heffron et al., 2018 ³⁷	+	!	!	!	-	!	?	?	?	+	+

Kinuthia et al.,2020 ²⁸	+	+	+	!	?	N/A	!	!	!	+	+
Koss et al., 2020 ⁴⁰	?	?	?	?	?	?	?	?	?	?	?
Koss et al.,2017 ⁴³	-	-	-	-	-	+	?	?	+	?	-
Lubwama et al., 2019 ⁴⁷	-	+	-	?	N/A	!	-	-	?	+	-
Mayer et al.,2019 ⁴¹	+	+	+	+	+	N/A	!	+	+	+	+
Mugwanya et al.,2019 ²⁶	+	+	?	?	!	!	!	!	!	+	!
Ongwen et al.,2019 ³²	!	!	?	!	+	N/A	!	-	!	?	-
Pintye et al.,2018 ²⁷	+	!	!	!	?	?	?	!	!	?	?
Rousseau et al.,2019 ³³	?	?	?	?	?	?	?	?	?	?	?
Travill et al.,2018 ³¹	!	?	?	!	?	?	?	-	-	-	-
Hill et al.,2020 ³⁰	+	+	+	+	+	+	+	+	+	+	+
Morton et al.,2020 ^{48*}	+	+	+	+	+	+	+	+	+	!	+
Minnis et al.,2020 ⁵⁴	+	+	+	+	+	+	+	+	+	+	+
Were et al.,2020 ^{35*}	+	+	+	+	+	+	+	+	+	+	+

+ = Yes/Low risk/No or very minor concerns; - = No/High risk/Serious concerns; ? = Can't tell/Unclear risk/Moderate concerns; ! = Minor concerns

*Mixed methods study, Modelling studies were not appraised

Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) Checklist

SECTION	ITEM	PRISMA-ScR CHECKLIST ITEM	REPORTED ON PAGE #
TITLE			
Title	1	Identify the report as a scoping review.	1
ABSTRACT			
Structured summary	2	Provide a structured summary that includes (as applicable): background, objectives, eligibility criteria, sources of evidence, charting methods, results, and conclusions that relate to the review questions and objectives.	2
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of what is already known. Explain why the review questions/objectives lend themselves to a scoping review approach.	3-5
Objectives	4	Provide an explicit statement of the questions and objectives being addressed with reference to their key elements (e.g., population or participants, concepts, and context) or other relevant key elements used to conceptualize the review questions and/or objectives.	5
METHODS			
Protocol and registration	5	Indicate whether a review protocol exists; state if and where it can be accessed (e.g., a Web address); and if available, provide registration information, including the registration number.	6
Eligibility criteria	6	Specify characteristics of the sources of evidence used as eligibility criteria (e.g., years considered, language, and publication status), and provide a rationale.	6-7
Information sources*	7	Describe all information sources in the search (e.g., databases with dates of coverage and contact with authors to identify additional sources), as well as the date the most recent search was executed.	7
Search	8	Present the full electronic search strategy for at least 1 database, including any limits used, such that it could be repeated.	7
Selection of sources of evidence†	9	State the process for selecting sources of evidence (i.e., screening and eligibility) included in the scoping review.	7
Data charting process‡	10	Describe the methods of charting data from the included sources of evidence (e.g., calibrated forms or forms that have been tested by the team before their use, and whether data charting was done independently or in duplicate) and any processes for obtaining and confirming data from investigators.	7
Data items	11	List and define all variables for which data were sought and any assumptions and simplifications made.	7
Critical appraisal of individual sources of evidence§	12	If done, provide a rationale for conducting a critical appraisal of included sources of evidence; describe the methods used and how this information was used in any data synthesis (if appropriate).	7



SECTION	ITEM	PRISMA-ScR CHECKLIST ITEM	REPORTED ON PAGE #
Synthesis of results	13	Describe the methods of handling and summarizing the data that were charted.	8
RESULTS			
Selection of sources of evidence	14	Give numbers of sources of evidence screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally using a flow diagram.	8-9
Characteristics of sources of evidence	15	For each source of evidence, present characteristics for which data were charted and provide the citations.	9-28
Critical appraisal within sources of evidence	16	If done, present data on critical appraisal of included sources of evidence (see item 12).	29
Results of individual sources of evidence	17	For each included source of evidence, present the relevant data that were charted that relate to the review questions and objectives.	29-33
Synthesis of results	18	Summarize and/or present the charting results as they relate to the review questions and objectives.	29-33
DISCUSSION			
Summary of evidence	19	Summarize the main results (including an overview of concepts, themes, and types of evidence available), link to the review questions and objectives, and consider the relevance to key groups.	33-36
Limitations	20	Discuss the limitations of the scoping review process.	36
Conclusions	21	Provide a general interpretation of the results with respect to the review questions and objectives, as well as potential implications and/or next steps.	36
FUNDING			
Funding	22	Describe sources of funding for the included sources of evidence, as well as sources of funding for the scoping review. Describe the role of the funders of the scoping review.	37

JBI = Joanna Briggs Institute; PRISMA-ScR = Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews.

* Where *sources of evidence* (see second footnote) are compiled from, such as bibliographic databases, social media platforms, and Web sites.

† A more inclusive/heterogeneous term used to account for the different types of evidence or data sources (e.g., quantitative and/or qualitative research, expert opinion, and policy documents) that may be eligible in a scoping review as opposed to only studies. This is not to be confused with *information sources* (see first footnote).

‡ The frameworks by Arksey and O'Malley (6) and Levac and colleagues (7) and the JBI guidance (4, 5) refer to the process of data extraction in a scoping review as data charting.

§ The process of systematically examining research evidence to assess its validity, results, and relevance before using it to inform a decision. This term is used for items 12 and 19 instead of "risk of bias" (which is more applicable to systematic reviews of interventions) to include and acknowledge the various sources of evidence that may be used in a scoping review (e.g., quantitative and/or qualitative research, expert opinion, and policy document).

From: Tricco AC, Lillie E, Zarin W, O'Brien KK, Colquhoun H, Levac D, et al. PRISMA Extension for Scoping Reviews (PRISMA-ScR): Checklist and Explanation. *Ann Intern Med.* 2018;169:467–473. doi: [10.7326/M18-0850](https://doi.org/10.7326/M18-0850).



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Service delivery models that promote linkages to PrEP for adolescent girls and young women and men in sub-Saharan Africa: A scoping review

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Title

Service delivery models that promote linkages to PrEP for adolescent girls and young women and men in sub-Saharan Africa: A scoping review

Authors

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Abstract

Background: Pre-exposure prophylaxis (PrEP) is an emerging biomedical prevention intervention. Documenting PrEP service delivery models (SDMs) that promote linkage to and continuation of PrEP will inform guidelines and maximise roll out.

Objectives: To synthesize and appraise the effectiveness and feasibility of PrEP SDMs designed to promote linkage to PrEP care among adolescent girls and young women (AGYW) and men in sub-Saharan Africa (SSA).

Eligibility criteria: Primary quantitative and qualitative studies published in English and conducted in SSA were included. No restrictions on the date of publication were applied.

Sources of evidence: Methodology outlined in the Joanna Briggs Institute reviewers' manual was followed. PubMed, Cochrane library, Scopus, Web of Science, and online-conference abstract archives were searched.

Charting methods: Data on article, population, intervention characteristics and key outcomes was charted in REDCap.

Results and Conclusion: Of the 1204 identified records, 37 (met the inclusion criteria. Health facility-based integrated models of PrEP delivery with family planning, maternal and child health or sexual and reproductive services to AGYW resulted in PrEP initiation of 16-90%. Community-based drop-in centres (66%) was the preferred PrEP outlet for AGYW compared to public clinics (25%) and private clinics (9%). Most men preferred community-based delivery models. Among individuals who initiated PrEP, 50% were men, 62% were <35 years old and 97% were tested at health fairs compared to home testing. Integrated antiretroviral therapy (ART)-PrEP delivery was favoured among serodiscordant couples with 82.9% of couples using PrEP or ART with no HIV seroconversions. PrEP initiation within healthcare facilities was increased by perceived client-friendly services and non-judgmental healthcare workers. Barriers to PrEP initiation included distance to travel to and time spent at health facilities and perceived community stigma. PrEP SDMs for AGYW and men need to be tailored to the needs and preferences for each group. Programme implementers should promote community-based SDMs to increase PrEP initiation among AGYW and men.

Key words: Pre-exposure prophylaxis, PrEP, linkage, adolescent girls, and young women, AGYW, men, sub-Saharan Africa

Strengths and limitations of this study

- A comprehensive search strategy was developed, and the search was carried out across multiple databases and conference archives.
- The methodology used in the scoping review was robust and included double data screening, extraction and synthesis.
- All included studies underwent critical appraisal of sources of evidence using approved tools.
- Studies not conducted in SSA and that were published in non-English languages were excluded.
- Most of the included studies were from Kenya, Uganda, and South Africa limiting the generalizability of the results.

Background

Recent reports indicate a decline in new HIV infections globally. However, this decline is occurring at a slower pace in regions with generalized HIV epidemics such as sub-Saharan Africa (SSA). In 2017, SSA accounted for 64% of new HIV infections globally.¹ Two underserved populations that are critical to drive the decline in new HIV infections are adolescent girls and young women (AGYW; 15-24 years) and men (25-65 years). AGYW are at substantial risk for HIV-infection with an estimated 310 000 new infections globally in 2018 – 86% of which was in SSA.¹ Men, on the other hand, account for more AIDS-related deaths globally than women – 400 000 deaths in men in 2018 compared to 270 000 in woman.¹

For differing reasons, AGYW and men show lower health seeking behaviour because of interpersonal and structural factors. AGYW's access to health services is limited by stigma, negative attitudes from healthcare workers and inconvenient clinic operating hours.² However, 'man unfriendly clinics' are characterised by inaccessible clinic hours/locations, difficulty in engaging with female staff, and gender norms that discourage men from accessing health services.^{3 4}

Amongst the 2020 Global Prevention Targets and Commitments is the reduction in the number of AGYW newly infected with HIV globally to below 100 000, and to ensure that 3 million people at substantial risk of contracting HIV have access to pre-exposure prophylaxis (PrEP).⁵ To achieve these targets, primary prevention programmes should be structured around five central pillars: (1) combination prevention for AGYW; (2) combination prevention with key populations; (3) voluntary medical male circumcision (VMMC) and sexual and reproductive health services (SRHS) for men and boys; (4) comprehensive condom

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3 programmes; and (5) rapid introduction of PrEP.⁵ PrEP for HIV refers to the use of
4 antiretroviral drugs among HIV-negative people to prevent the acquisition of HIV.⁶
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7 PrEP has shown effectiveness in reducing HIV acquisition among couples, sex workers, men
8 who have sex with men (MSM), transgender and people who inject drugs and AGYW.⁷ The
9 impact of PrEP on the HIV epidemic depends on the extent of PrEP initiation among people
10 at substantial risk for HIV infection (World Health Organization (WHO) defined substantial risk
11 of HIV acquisition as HIV incidence of 3 per 100 person-years or higher in the absence of
12 PrEP).^{7,8} Since September 2015, the WHO recommended offering oral PrEP to every person
13 at substantial risk of contracting HIV.⁷ In the current South African guidelines for PrEP, specific
14 populations considered to be at substantial risk of HIV infection include AGYW, MSM, people
15 with more than one sexual partner, people who inject drugs, people with a recent history of
16 sexually transmitted infections, people who recognise their own risk and request PrEP,
17 serodiscordant couples if the HIV positive partner is not virally suppressed, and sex
18 workers.^{9,10}
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26 Literature on PrEP has largely been focused on knowledge, attitudes, and interest in PrEP. As
27 countries scale up use of PrEP as part of their combination prevention packages, evidence on
28 service delivery models (SDMs) that promote initiation and continuation on PrEP are needed
29 especially among vulnerable and hard to reach populations such as AGYW and men. HIV
30 prevention cascades have been proposed as a logical framework to monitor populations at
31 substantial risk for HIV acquisition as they navigate the steps from HIV testing to assessing the
32 risk of the individual to determining PrEP eligibility before PrEP initiation and continuation or
33 discontinuation.
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38 PrEP initiation represents a critical step in the PrEP cascade (Figure 1),^{8,10} because it reflects
39 people's awareness and interest in lowering their risk for HIV. Differentiated models, which
40 are centred around clients' needs and expectations and relieving unnecessary burdens on the
41 health system while targeting behavioural and structural determinants of AGYW and men,
42 can potentially increase acceptability and accessibility of PrEP. These include innovative
43 strategies that streamline HIV testing, link AGYW and men to HIV prevention services, provide
44 differentiating medication access points, reduce stigma and barriers of parental consent for
45 PrEP initiation.¹¹ PrEP SDMs should be designed with the populations being served central to
46 the design.¹²
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[Insert Figure 1 here]

Figure 1: Oral PrEP cascade: Adapted from Dunbar et al (2018)⁸

Following an HIV-negative diagnosis (step 1), an individual is assessed for risk of HIV (step 2). An individual at substantial risk of HIV acquisition or who requests pre-exposure prophylaxis (PrEP) is assessed for eligibility for PrEP (step 3). After documenting eligibility for PrEP use, several baseline clinical investigations are conducted (step 4) PrEP is initiated (step 5) on the same-day as HIV testing. The recommended regimen is Tenofovir (TDF) / emtricitabine (FTC) 1 tablet by mouth daily. PrEP continuation visits (step 6) include: month 1, every 3 months. PrEP is discontinued (step 7) if the individual tests HIV positive, develops renal disease, is non-adherent, does not want or need PrEP, no longer meets eligibility criteria, or if there are safety concerns.

PrEP is an emerging prevention implementation science (IS) research area. However, at present, there is a gap in knowledge on the characteristics of AGYW and men who initiate PrEP compared to those who do not initiate PrEP. This information is critical for informing national policies and implementation guidelines for PrEP roll-out. As such, the aim of this review was to synthesize and appraise the effectiveness and feasibility of PrEP SDMs designed to promote linkage to care among AGYW and men eligible for PrEP in SSA. The objectives were to a) summarize SDMs that promote PrEP initiation and b) explore users' perceptions, and barriers and facilitators of these models.

Methods

We used a scoping review design to map existing literature, explore the research studies conducted and identify research and knowledge gaps in models used to deliver PrEP.¹³ Scoping reviews can be of particular use when the topic has not yet been extensively reviewed or is of a complex or heterogeneous nature.¹⁴ The research question was defined using the Population- Intervention-Comparison-Outcome (PICO) framework (Table 1). We defined our outcomes as i) Linkage to PrEP care (defined as the proportion of AGYW or men who are initiated on PrEP following an HIV-negative diagnosis, step 7 of Figure 1) and ii) perceptions, barriers, and facilitators of SDMs. The service delivery model was defined as the setting used for delivery of PrEP viz. facility-only, community-only, research-only, mobile-only and a hybrid model encompassing two or more of the above settings.

Table 1: Scoping review population, intervention, and outcome

Population	Heterosexual females (15-24 years) and men (25-65 years)
Intervention	Interventions (SDMs) designed to improve PrEP initiation
Comparison	Not applicable
Outcome	Linkage to PrEP care (defined as the proportion of AGYW or men who are initiated on PrEP following a HIV-negative diagnosis) and perceptions on SDMs

Protocol and registration

This review was conducted and reported in line with the Joanna Briggs Institute (JBI) reviewer's manual and structured using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for scoping reviews (PRISMA-ScR).^{15 16} A review protocol for this scoping review was registered with the Open Science Framework (DOI 10.17605/OSF.IO/EG9TD).

Research ethics approval

The scoping review focuses on published research in the public domain therefore no ethics approval is required.

Patient and public involvement

No patients or public were involved in the study.

Eligibility criteria

We included primary studies on PrEP service delivery models for AGYW and men, with both qualitative and quantitative study designs published in English and conducted in SSA. No restrictions on the date of publication were applied. Table 2 details the inclusion criteria applied to studies. We excluded studies that were focused exclusively on key population groups in HIV programmes such as lesbian, gay, bisexual, MSM etc. and publication types (e.g., systematic reviews, case studies, etc).

Table 2: Eligibility criteria describing study inclusion criteria for the scoping review

Study type	Quantitative studies including randomized clinical trials (RCT), quasi-randomized, and non-RCTs, longitudinal observational (historical cohorts, prospective cohorts, case-control, and before-and-after studies), analytic cross-sectional studies, and non-comparative studies
	Qualitative studies using any study design
Population	Study population included heterosexual females (15-24 years) and males (25-65 years)
Outcomes	Focus of research: PrEP SDMs i.e., service provision / IS / models of care / differentiated care / linkage to care / intervention
	Papers reporting on barriers and facilitators of PrEP SDMs
	Papers on user perceptions of PrEP SDMs
Setting	Sub-Saharan African countries – based on the World Bank's country classification ¹⁷

Information sources and search strategy

PubMed, Cochrane library, Scopus, and Web of Science including three online conference archives (AIDS conference, Conference on Retroviruses and Opportunistic Infections and International AIDS Society Conference on HIV Science) were searched. The reference list of systematic reviews was checked to identify relevant primary studies. The three-step search strategy recommended by the JBI Reviewer's Manual was used.¹⁵ During the first step, one author (WC) conducted an elementary search on PubMed to establish the volume of relevant articles on the topic. Two authors (WC and TR) then screened the title and abstract of the retrieved articles to identify keywords and index terms which were used to build a search strategy (see online supplementary appendix 1). The final search results were exported into EndNote,¹⁸ and duplicates were removed.

Selection of sources of evidence

Titles and abstracts were double screened in Rayyan¹⁹ by any two of a group of eight independent authors (TR, WC, KJ, NJ, DG, TMA, MH, ET). There was no restriction placed on age range during the screening phase to ensure that articles with age disaggregated analysis were included. Full text articles and conference abstracts, including articles from the 2020 AIDS conference were retrieved and independently double screened by WC and TR.

Data charting process and data items

Using a pre-designed data-charting form, key and relevant information were systematically extracted from full-text articles in REDCap²⁰ by any two of a group of ten independent authors (TR, WC, TMA, NJ, DG, BZ, CM, MH, ET, EN). We charted data on article characteristics, population characteristics, intervention characteristics, and key outcomes (Table 1).

Critical appraisal of individual sources of evidence

Information for quality assessment was incorporated into the data charting form on REDCap.²⁰ Due to the different study designs and research methodologies adopted in the included studies, we used three different tools to appraise the articles. For comparative studies including randomised trials, non-randomised trials, interrupted time-series and controlled before-after-studies, we used the risk of bias criteria recommended by the Effective Practice and Organisation of Care (EPOC).²¹ For qualitative studies, we used the Critical Appraisal Skills Programme (CASP) checklist.²² For other studies we used the Ways of Evaluating Important and Relevant Data (WEIRD) tool.²³ Modelling studies were excluded from the appraisal step.

Analysis

For quantitative studies we used a narrative analysis and tabulated data by gender and by SDM. We summarized the settings, populations, and sample for each group, along with the

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3 interventions and findings. For qualitative studies, we did a thematic analysis that resulted in
4 organising the data into themes, authors' interpretations, and quotes and integrated these
5 findings to support the quantitative data. We tabulated the data by SDMs (health facility,
6 community, research, or mobile) and by population (AGYW only, men only, or models for
7 both). Furthermore, we determined the existing gaps in the different categories of
8 interventions that can be strengthened to promote initiation and continuation on PrEP among
9 AGYW and men.
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16 Results

17 Selection of sources of evidence

18 Our search identified 1604 citations. After duplicates (413) were removed, a total of 1204
19 titles and abstracts were identified from searches of electronic databases and 13 from other
20 sources including conferences. The PRISMA flow diagram (Figure 2) illustrates the screening
21 process to identify records that meet the study inclusion criteria. Based on the screening of
22 title and abstracts, 1102 records were excluded, with 102 full text articles and conference
23 abstracts to be retrieved and assessed for eligibility. From the review of full text articles 67
24 were excluded for the following reasons: editorials/commentaries/reviews/protocols,
25 interviews with stakeholders, articles on topical PrEP, wrong outcome and focus on key
26 populations. During data charting, two additional articles were excluded. Four additional
27 articles were added after the initial search process, these articles were identified following
28 the 2020 AIDS conference in July. The final number of studies that were considered eligible
29 for this scoping review were 37 (27 studies and 10 conference abstracts).
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38 [Insert Figure 2 here]

39 Figure 2: PRISMA flow diagram

40 Adapted from: Moher et al²⁴

41 Description of sources of evidence

42 A description of the characteristics, setting, SDMs and intervention modalities of the included
43 studies are provided in online supplementary appendix 2. There was a mixture of quantitative
44 (n=23), qualitative (n=11) and mixed method studies (n=3). Most studies were
45 demonstration/IS projects (n=10) while other methodological approaches included
46 randomised controlled trials (RCTs) (n=5) and cross-sectional studies (n=5). Most were
47 conducted in Kenya (n=17), with the remainder conducted in Uganda (n=10), South Africa
48 (n=10), Tanzania (n=3), Malawi (n=2), Mozambique (n=2), and Zimbabwe (n=1). These studies
49 reported evidence on the following PrEP SDMs; health facility (6), mobile (1), research site
50 (8), community (6), hybrid (10), and not described/not applicable (6). Thirteen studies focused
51 on AGYW, 19 studies focused on AGYW and men, one study focused on men only, and four
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3 were classified as other (i.e., age categories were not specified). PrEP services were offered
4 in 25 of the 37 studies whilst PrEP perceptions/opinions were assessed in the other 12 studies.
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7 **Critical appraisal of evidence**

8 Full text articles appraised using the WEIRD tool were mostly assessed as having either no or
9 very minor or moderate concerns for items that were unclear in the article (see online
10 supplementary appendix 3). Most of the qualitative studies or abstracts performed well on all
11 items except on items 4 (the recruitment strategy was appropriate to the aims), 8 (the rigour
12 of the data analysis) and 10 (the value of the research in terms of its contribution to the
13 literature and/or policy and process). Due to limited information in the abstracts to clearly
14 answer the items using the WEIRD tool, most of the abstracts were appraised as either having
15 an unclear or serious risk of bias.²⁵⁻³⁰
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22 **Results of sources of evidence**

23 **PrEP SDMs for AGYW**

24 Amongst AGYW, PrEP SDMs included HF-B (n=6), hybrid (mobile clinic-healthcare facility or
25 community-healthcare facility, n=3), research site (n=2) and mobile clinic (n=1) (see online
26 supplementary appendix 2).
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30 Health facility

31 Three studies from Kenya evaluated a HF-B delivery modality by integrating PrEP delivery into
32 routine services. Mugwanya et al.³¹ evaluated integrated delivery of PrEP in family planning
33 (FP) clinics whilst Kinuthia et al. and Pintye et al. evaluated approaches to integrate PrEP into
34 maternal and child health (MCH) clinics providing antenatal care (ANC) and post-natal care
35 (PNC).^{32 33} Integration of universal screening and counselling for PrEP in FP and MCH clinics
36 resulted in PrEP initiation of 16% and 49.2% respectively among AGYW. Younger women (≤ 24
37 years) who initiated PrEP at MCH clinics were significantly more likely to return for a PrEP
38 refill at month 3 compared to women >24 years (54.9% versus 45.1%) ($p=0.05$).³² These
39 studies utilised nurses dedicated to providing PrEP services only, which may limit applicability
40 in a sub-Saharan setting where facilities have a limited clinical workforce. A study by Ngunjiri et
41 al. which integrated PrEP with FP services found that PrEP dispensation was more frequent
42 among those concurrently using effective contraception, (adjusted relative risk [aRR]=1.19;
43 95% confidence interval [CI]=1.08-1.32) and contraceptive use was more common among
44 those on PrEP (aRR=1.63; 95% CI=1.18-2.25).³⁴ Pintye et al. found that participants who
45 initiated PrEP at MCH clinics took an additional 18 minutes for PrEP related activities over and
46 above the time spent at the clinic to receive routine MCH services. The additional time could
47 deter AGYW from initiating and continuing PrEP and depending on healthcare facility size and
48 patient volume integrating PrEP into these routine services could result in several additional
49 hours of work for nurses.³³
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60 Hybrid (community-health facility)

Two studies evaluated the scaling up of PrEP in Kenya through integration into routine health services in drop-in centres (DICEs), public and private health facilities.^{28 35} Ongwen et al. reported that within the context of the Jilinde project, which implements oral PrEP as a routine service at a public health scale in Kenya, 6.5% AGYW initiated PrEP, and DICEs were the preferred PrEP outlet for adolescent girls with 66% accessing services in DICEs, 25% in public clinics and 9% in private clinics. Amongst AGYW who initiated PrEP, the entry channel into the PrEP pathway was through peer educators and networks (50%); community outreaches (20%); and within health facilities (30%).²⁸ Were et al. found that among all individuals eligible for PrEP in the study which included female sex workers and MSM, 11% of AGYW initiated PrEP.³⁵ The majority (81%) of clients initiated PrEP through DICEs, whereas 14% and 5% were initiated through public and private facilities respectively. The majority of AGYW did not persist on PrEP use at month-1 (68% drop off) and month-3 (94% drop off) follow-ups. Qualitative evidence from this study found that AGYW who initiated PrEP in public and private health facilities reported insensitive referral and access to the PrEP delivery pathways where *"The (HIV) testing place is different from the place I was asked questions and the place for collecting the medicine is also different. We took long because we were walking from one place to another"*.³⁵

Research site

Delany-Moretlwe conducted an RCT in Tanzania and South Africa to evaluate whether empowerment clubs increased PrEP initiation and continuation among AGYW. Participants were randomised to the standard of care (SoC), which included comprehensive SRHS, with counselling and short message service (SMS) reminders for PrEP users, or to empowerment clubs plus SoC. Across both arms, 97% initiated PrEP. PrEP continuation did not vary significantly by study arm and diminished with time (73% at Month-1, 61% at Month-3 and 34% at Month-6).³⁶ Donnell et al. found that HIV incidence declined significantly after on-site provision of PrEP at the research sites.³⁷ Hill et al. found that epidemiologic HIV risk scores were positively associated with PrEP interest, and that high numbers of AGYW both above and below the high-risk cut-off were very interested in PrEP (68% vs. 63%).³⁸

Mobile

A South African study found that integrating PrEP with SRHS and delivering it via an adolescent-friendly mobile clinic led to an increase in both PrEP initiation and contraception. AGYW who were using contraception were significantly more likely to initiate PrEP (76%) on the same-day compared to those who were not using contraception and declined PrEP (66%) ($p=0.001$). Contraception was initiated by 44% of AGYW on the same-day as PrEP initiation compared to 30% who declined PrEP ($p=0.003$).²⁹ No qualitative evidence on the acceptability and feasibility of mobile delivery models were identified.

Overall perceptions of SDMs by AGYW

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3 In a study conducted in Malawi, Maseko et al found high levels of hypothetical PrEP
4 acceptability among AGYW who reported that interest in PrEP depends on confidential access
5 and discrete packaging (cartons or bottles that resemble treatment for common ailments) of
6 the drug. Moreover, AGYW reported that youth-friendly delivery modalities such as schools
7 and youth-friendly sections of health centres that provide *"...a place for the youths to be*
8 *comfortable getting these drugs..."* may facilitate the initiation of PrEP as a prevention
9 strategy.³⁹
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14 **PrEP SDMs for men**

15 We found one mixed method study among young South African men. PrEP was not provided,
16 but hypothetical perceptions, barriers and enablers of PrEP initiation were assessed. Whilst
17 only 11% of men were aware of PrEP, 62% reported that they were very likely to take it. The
18 young men preferred to keep PrEP use a secret from their partners, friends, and family. PrEP
19 initiation was also dependent on the SDM used. Receiving PrEP from the clinic was reported
20 as a barrier to PrEP usage as this could incite community stigma. Young men reported that
21 *"...they (community) would immediately think that you are HIV positive already, not that you*
22 *are taking the prevention one..."*
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29 **PrEP SDMs for AGYW and men**

30 We found 19 studies that assessed various SDMs for linkages to PrEP for AGYW and men.
31 Amongst AGYW and men, PrEP SDMs included hybrid (research site-healthcare facility or
32 community-healthcare facility, n=8), community (n=5) and research site (n=6). These studies
33 either recruited serodiscordant couples or included AGYW and men as individual participants.
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38 Hybrid

39 We identified seven studies that used a hybrid model to deliver PrEP.⁴⁰⁻⁴⁶
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42 One study from Kenya and Uganda by Heffron et al. involved a hybrid (research site- health
43 facility) model that integrated PrEP delivery into antiretroviral therapy (ART) treatment
44 services for high-risk HIV serodiscordant couples.⁴⁰ The intervention was mainly couples-
45 based and involved HIV prevention counselling; safer conception counselling or
46 contraceptives; counselling and HIV testing for HIV-negative partner; PrEP
47 initiation/prescription; and referral to a local health facility for the HIV infected partner for
48 ART. The results showed high uptake of integrated PrEP and ART with an estimated 96%
49 reduction in HIV incidence (82.9% of couples used PrEP or ART and there were no HIV
50 seroconversions, 14.5% used some ART and/or PrEP and 2.6% used neither PrEP nor ART).⁴⁰
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56 Qualitative evidence that explored HIV serodiscordant couple's decision-making and
57 motivations to initiate PrEP through this integrated ART-PrEP approach showed that a positive
58 clinical encounter with a healthcare provider and client-friendly services played a critical role
59 in the couple's decisions to initiate and continue PrEP.⁴⁵ Clear messaging, in-depth
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3 counselling and friendly, non-judgmental/stigmatizing services provided by healthcare
4 workers empowered, reassured and promoted PrEP initiation among HIV serodiscordant
5 couples with some describing it as “*service beyond the medicine*’.⁴⁵ Furthermore, being at a
6 place where service is offered to both couple (ART for the HIV positive partner and PrEP for
7 the HIV-negative partner) motivated their decision.⁴⁵
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11 Five studies used a hybrid mobile testing approach implemented at community health fairs,
12 home, or local health facility.^{26 41-44} Two studies from Kenya and Uganda showed that PrEP
13 initiation was high (>75%) among individuals who received HIV testing on the same-day.^{41 43}
14 Mayer et al. found that 39% of participants initiated PrEP within 4 weeks of the community
15 health campaign.⁴² However, the distance between the participants and the healthcare
16 provider influenced PrEP initiation.
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21 Koss et al. and Camlin et al. who explored barriers influencing PrEP initiation using the hybrid
22 (community-health facility) model,^{26 44} found that PrEP initiation was hindered by HIV/ART-
23 related stigma which emanated from the colour of the pill being the same as HIV treatment
24 regimens, and access of PrEP services at the same facility where HIV care is provided.⁴⁴ Men
25 reported that the “... *majority of us fear to go to the health center...*” and suggested
26 alternatives such as designating a clinic day for PrEP or “...*distribute [PrEP] to the people...*”.
27 Participants reported that healthcare workers should deliver PrEP or find delivery methods
28 that are easily accessible by the community “...*just like they did with condoms.*” Young adults
29 who attended school outside the community could not initiate PrEP given that PrEP was only
30 provided within study communities. Furthermore, school attendance made initiating and
31 continuing PrEP challenging.^{26 44}
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38 Community

39 Two South African studies conducted in a community setting explored the hypothetical
40 opinions of PrEP among salon owners, stylists, and clients.^{47 48} Ninety-five percent of owners
41 and stylists and 77% of clients were comfortable with PrEP being offered at hair salons,⁴⁸
42 which provide a geographically convenient and conducive environment for receiving health
43 services.^{47 48} A third community-based study which used a 90-second PrEP demand creation
44 video and informational brochures, found that 68% and 56% of young women respectively
45 reported that they were definitely interested in learning more about and initiating PrEP. The
46 study also found that young women preferred realistic visuals that they could identify with,
47 rather than highly stylized models. Data evaluated by Lubwama et al. showed that 69.2% of
48 key populations which included AGYW and serodiscordant couples were reached through
49 drop-in centres and community-based outreach centres providing PrEP versus fixed public
50 health facilities.⁴⁹ The proportion that returned for PrEP was higher among serodiscordant
51 couples (3 months: 56.9%, 6 months: 46.8%) compared to sex workers (3 months: 37.5%, 6
52 months: 26.3%).
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Clinical Research Site

In three of the six studies conducted at a clinical research site,^{27 40 50-54} PrEP was integrated with ART or with ART and other interventions such as VMMC.^{40 51 52} Across the three studies, ≥95% of the HIV-negative partner within serodiscordant couples initiated PrEP. The use of PrEP in combination with ART or other prevention interventions (VMMC) or conception strategies resulted in reduced HIV incidence. Serodiscordant couples found that the “couples-focused” services provided through the integrated PrEP-ART strategy strengthened their relationships.

Overall perceptions of SDMs by AGYW and men

Several studies explored factors that influence PrEP initiation, non-initiation and discontinuation in individuals who received PrEP through the different SDMs.^{26 27 44-46 54} Motivators to initiate PrEP included: perception of high-risk, preference of PrEP over other HIV prevention methods, protection from unwanted/forced sexual encounters, love for one's partner, knowledge about PrEP and the belief it is effective, partner support belief that PrEP supported life goals and a positive clinical encounter.^{26 27 44-46 54 55} Females preferred a product that was delivered at a health clinic over accessing it at a pharmacy.⁵⁶ Barriers to PrEP initiation included daily pill burden, side effects, mixed dosing messaging, living with parents or attending school, partners consent or partners reaction to use and HIV-related stigma.^{26 27 44-46 54 55}

Other models

We identified four other studies that explored other methods of promoting PrEP initiation among AGYW and men.⁵⁷⁻⁶⁰ Jani et al. explored male partners support for hypothetical PrEP use by AGYW.⁵⁹ Male partners highlighted that their support would be contingent on their early involvement in the decision-making process regarding PrEP which would alleviate suspicion of infidelity. AGYW suggested that not including male partners may result in social harms (partner violence, dissolution of relationships). Strategies recommended by male partners included couples counselling, educating, and providing PrEP to men and community sensitization. Makyao et al. explored parental support of AGYW's hypothetical use of PrEP. Parents supported PrEP availability acknowledging the risks faced by AGYW.⁶⁰ However, support was also influenced by social norms (promoting promiscuity or condoning sexual activity). Differential parenting roles influenced the type of support: mothers suggested providing a conducive environment (good diet) for PrEP use whilst fathers suggested providing operational support (transport money). Cremin et al. and Irungu et al. reported that providing time-limited PrEP during periods of increased exposure would be a novel, efficient and cost-effective strategy for providing PrEP.^{57 58}

Discussion

The purpose of this review was to synthesize and appraise the effects on PrEP initiation and the acceptability and feasibility of PrEP SDMs designed to promote linkage to care among AGYW and men eligible for PrEP in SSA. Given the challenging interactions between AGYW and men and the health system, we reviewed evidence of PrEP initiation in a range of SDMs i.e., health facility-, mobile-, community- based or hybrid models, and we explored the perceptions, barriers, and facilitators of these models. This scoping review identified 27 primary studies and 10 conference abstracts.

Delivery of PrEP to AGYW included HF-B models which integrated PrEP into routine FP/MCH/SRH/ANC services, hybrid models which allowed AGYW to initiate PrEP either at community-based venues or private or public facilities and mobile models. Whereas integrated models provided at a public health facility offer a potential “one-stop” location for AGYW to initiate PrEP whilst accessing other services, the additional time spent on PrEP-related activities may deter AGYW from initiation. Integrated delivery of PrEP provides an opportunity to respond to potential syndemics in AGYW who are eligible for PrEP; however, we found mixed results regarding the effectiveness of integrated models on PrEP initiation. Two studies in which PrEP was initiated in an FP or MCH clinic showed PrEP initiation of <50% with initiation being higher in women >24 years.^{31 32} A third multi-country study which integrated PrEP with SRHS at FP clinics showed 90% PrEP initiation.³⁰ These studies were primarily implementation studies without a comparator, and PrEP related activities were provided by a PrEP-dedicated nurse. This task-shifting strategy removed this additional service from the workload of already overburdened routine nurses; however, the feasibility of this approach requires further evaluation considering the human resources challenges in SSA. Integration of HIV services and other health services has shown to be a useful strategy to improve linkage to HIV care, ART initiation and viral suppression. The most common forms of integration were (i) HIV testing and counselling added to non-HIV services and (ii) non-HIV services added to antiretroviral therapy (ART). The most commonly integrated non-HIV services were maternal and child healthcare, tuberculosis testing and treatment, primary healthcare, family planning, and sexual and reproductive health services.⁶¹

Adolescent-friendly clinics or adolescent-friendly sections within health facilities were also shown to promote initiation of PrEP.^{29 30 39} However, a New York study of adolescents' PrEP awareness showed that 86% of adolescents eligible for PrEP reported never being informed about PrEP by their healthcare professionals.⁶² Taggart et al. found that provider attitudes and recommendations within a healthcare facility influence adolescents' willingness or unwillingness to use PrEP.⁶³ Our results show that AGYW favour community-based youth-friendly delivery modalities of PrEP such as DICEs or schools over delivery via public and private health facilities. These findings concur with other studies which have shown that factors that influence US women's decision-making about the use of PrEP include the ease of

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3 accessing services and medication close to their homes.^{64 65} Moreover, women highlighted
4 the importance of community peers in influencing their decisions to initiate PrEP.⁶⁵
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7 We identified only one study among young, heterosexual men that explored the hypothetical
8 perceptions of PrEP initiation. Men reported that if PrEP was available, they would use it.
9 However, initiation was dependent on SDM and a HF-B model was not favoured due to
10 community stigma.²⁵ Heterosexual men are not classified as a key or vulnerable population in
11 the HIV prevention response, as such research that focuses on PrEP initiation or SDMs among
12 heterosexual men is limited. Increasing the engagement of men with health services requires
13 an understanding of the structural barriers that limit their access and requires targeted and
14 adaptive interventions to meet the needs of men. Differentiated service delivery models (for
15 example facility-based and/or community-based adherence clubs and quick pharmacy pick-
16 up) has been shown to improve uptake and retention of men in HIV treatment services.⁶⁶
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22 In studies that targeted both women (including AGYW) and men, SDMs included a hybrid
23 approach (research site-community or community-health facility), community-based models
24 and those based at research sites. PrEP delivery to serodiscordant couples involved integrated
25 models such as delivery of PrEP and ART to serodiscordant couples allows both partners to
26 interact with the health system. In such models, PrEP is initiated and continued only until the
27 HIV infected partner achieves viral suppression which may be a cost-effective approach if viral
28 suppression is achieved timeously.⁴⁰ However, in a sub-Saharan setting where <65% of people
29 living with HIV have suppressed viral load (VL) (<1000 copies/mL) and there are health
30 systems challenges with VL testing and turn-around-time, integrated delivery of PrEP and ART
31 may not be feasible.^{1 67} Our findings have shown that community-based models which involve
32 same-day HIV testing and PrEP initiation are favourable especially among men.⁴³
33 Furthermore, the delivery of PrEP through innovative community-based venues such as hair
34 salons which provided a comfortable and familiar environment yielded high interest in PrEP
35 initiation.⁴⁷ Many participants reported the convenience of pharmacies located close to public
36 transport routes, as many did not have access to cars or did not want to bear the cost of fuel
37 incurred travelling to the clinic.⁶⁸
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44 Both AGYW, men and serodiscordant couples have expressed that PrEP initiation is influenced
45 by the setting i.e., a friendly environment and by the attitude of healthcare workers i.e., non-
46 judgmental/non-stigmatizing.^{30 45} This suggests that the successful delivery of PrEP to AGYW
47 or men using HF-B models either through integrated or standalone approaches requires
48 healthcare workers to play an essential role.^{69 70} Structural barriers to PrEP initiation included:
49 the distance to travel to and time spent at health facilities. To address these barriers, there
50 is an increasing need for differentiated SDMs that provide alternative access options
51 especially considering that PrEP is a prevention intervention delivered to individuals who are
52 generally of good health and who may be disinclined to travel long distances and wait in long
53 queues to access PrEP.⁷¹
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59 *Policy and programme recommendations and future research areas*
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3 Notably, literature on PrEP SDMs for AGYW and more especially heterosexual men is limited
4 thus calling for more research in these areas. In order to increase PrEP initiation, country
5 programme implementers need to understand which SDM/s work for AGYW or men and to
6 adapt these to best suit the unique needs of the users.⁷² Opportunities exist for integrated
7 strategies of PrEP delivery at a health facility or mobile clinic. However, we need to
8 understand which integrated strategy (e.g., integration with ART, SRHS, or contraceptive
9 services) is most acceptable and scalable for AGYW and men. Further research is needed
10 among couples where one partner is on PrEP, to understand if the perception of risk changes
11 in the partner who is not on PrEP. We identified only one conference abstract that targeted
12 PrEP SDM among heterosexual men. This study was also limited as PrEP was not provided,
13 but hypothetical perceptions of PrEP were assessed. This dearth of published literature
14 highlights a major gap in the knowledge with considerably more research needed to
15 investigate SDMs among men. Training and retraining of healthcare workers on PrEP
16 guidelines is essential to equip them with the skills to ensure that PrEP is delivered in a friendly
17 and safe space by non-stigmatizing healthcare workers. To mitigate the time burden and
18 travel expenses incurred by AGYW and men, same-day initiation of PrEP to those eligible and
19 multi-months dispensing of refills should be considered.^{11 71 73}

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27 Furthermore, task-shifting among healthcare workers along the PrEP cascade will avoid
28 additional burden on the health system. Further studies are required to evaluate the
29 feasibility of PrEP-dedicated nurses. Differentiated SDMs are needed to take PrEP to where
30 users live, socialise and work.¹¹ These models include home deliveries, pharmacies, DICES,
31 salons, mobile clinics and tele-medicine-assisted models in both the public and private health
32 sectors. Mobile clinics near schools could be successful but need to be regular, reliable, and
33 sustainable. Furthermore, considering that eligibility for continuation on PrEP requires repeat
34 HIV testing, there is a need for interventions (e.g., HIV self-testing) to address this challenge
35 when PrEP is delivered at non- HF-B settings.

40 Limitations

41 The strengths of this review include the inclusion of multiple databases across disciplines and
42 broad inclusion criteria. We also used a comprehensive search strategy that followed the JBI
43 reviewer's manual and structured using PRISMA-ScR guidelines, and robust methods that
44 included double data screening, extraction, and review. Another strength is that we included
45 grey literature and unpublished reports which minimizes the chances of missing studies with
46 negative or null findings. Limitations include the exclusion of studies conducted in non-SSA
47 and that were published in non-English languages. In addition, due to a lag in adding and
48 indexing articles in various online databases, our review could fail to locate the most recent
49 publications and research on SDMs for PrEP initiation. Another limitation was that most of
50 the included studies were from 3 countries (Kenya, Uganda, and South Africa) hence the
51 generalisability of the results to SSA might be limited. Furthermore, there were limitations in
52 the sources of evidence as many of the studies evaluated the hypothetical perceptions of PrEP
53 initiation and some of the feasibility and acceptability is theoretical which may not translate
54 to actual realities. Due to the dearth of literature on SDMs among AGYW and men and
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3 considering that PrEP roll out in this population in many SSA countries has only recently been
4 maximised, we included research studies to understand the SDMs in this setting. Although
5 the recruitment criteria in a research setting may have resulted in a higher initiation of PrEP,
6 the lessons learnt from this setting could contribute to improving the roll out of PrEP in AGYW
7 and men. Critical appraisal of evidence from conference abstracts was limited by the
8 information provided in the abstract. As such, many items for conference abstracts on the
9 CASP tool were adjudicated as can't tell or unclear risk.
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14 **Conclusions**

15 We conducted a scoping review on PrEP SDMs, summarising evidence on PrEP initiation using
16 existing models among AGYW and men and explored the users' perceptions, and barriers and
17 facilitators of these models. These models were mostly found to be hybrid approaches
18 (research site-health facility or community-health facility), community-based or based at a
19 research site. Community-based models at convenient locations were favoured by both
20 AGYW and men. Integrated strategies delivered at friendly health facilities by non-
21 stigmatising healthcare providers was also a preferred PrEP delivery channel. The successful
22 initiation of PrEP by AGYW and men will be dependent on the service setting where it is
23 offered and cannot be considered as a one size fits all approach. Care must be taken to find
24 the delivery method best suited to each sub-population. Future research should focus on
25 what differentiated SDMs work for AGYW and heterosexual men to identify which approach
26 is most successful in improving PrEP initiation and to understand their individual needs when
27 using these models.
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43 **Disclaimer**

44 The findings and conclusions in this manuscript are those of the authors and do not
45 necessarily represent the official position of the US Centers for Disease Control and
46 Prevention.
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51 **Author Contributions:**

52 All authors contributed to conceptualising and designing the study. WC and TR conducted the
53 literature search. WC, TR, KJ, NJ, DG independently performed screening. WC, TR, CM, EN, ET,
54 MH, TMA, NJ, DG, BZ, WB and FM independently performed data extraction. EN developed
55 the data charting form on REDCap. WC and TR performed initial data synthesis and
56 interpretation and all authors refined it. WC and TR drafted the manuscript. All authors
57 contributed to writing and reviewing the manuscript.
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5 **Competing Interests:** None declared

6
7 **Patient consent for publication:** Not required

8
9 **Data availability statement:** All data relevant to the study are included in the article or
10 uploaded as supplementary information.

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12 **Ethics Approval:** The scoping review focuses on published research in the public domain
13 therefore no ethics approval is required.
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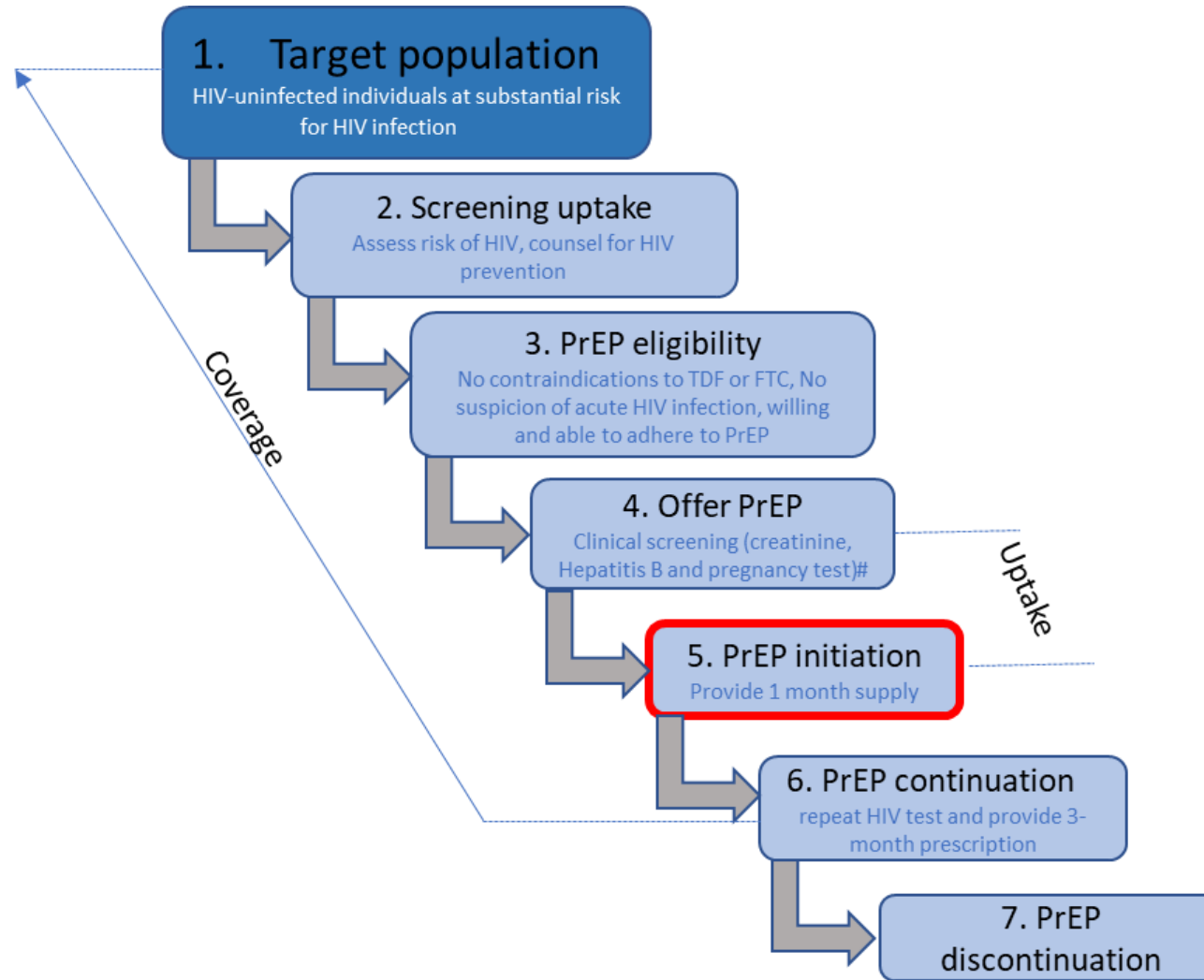
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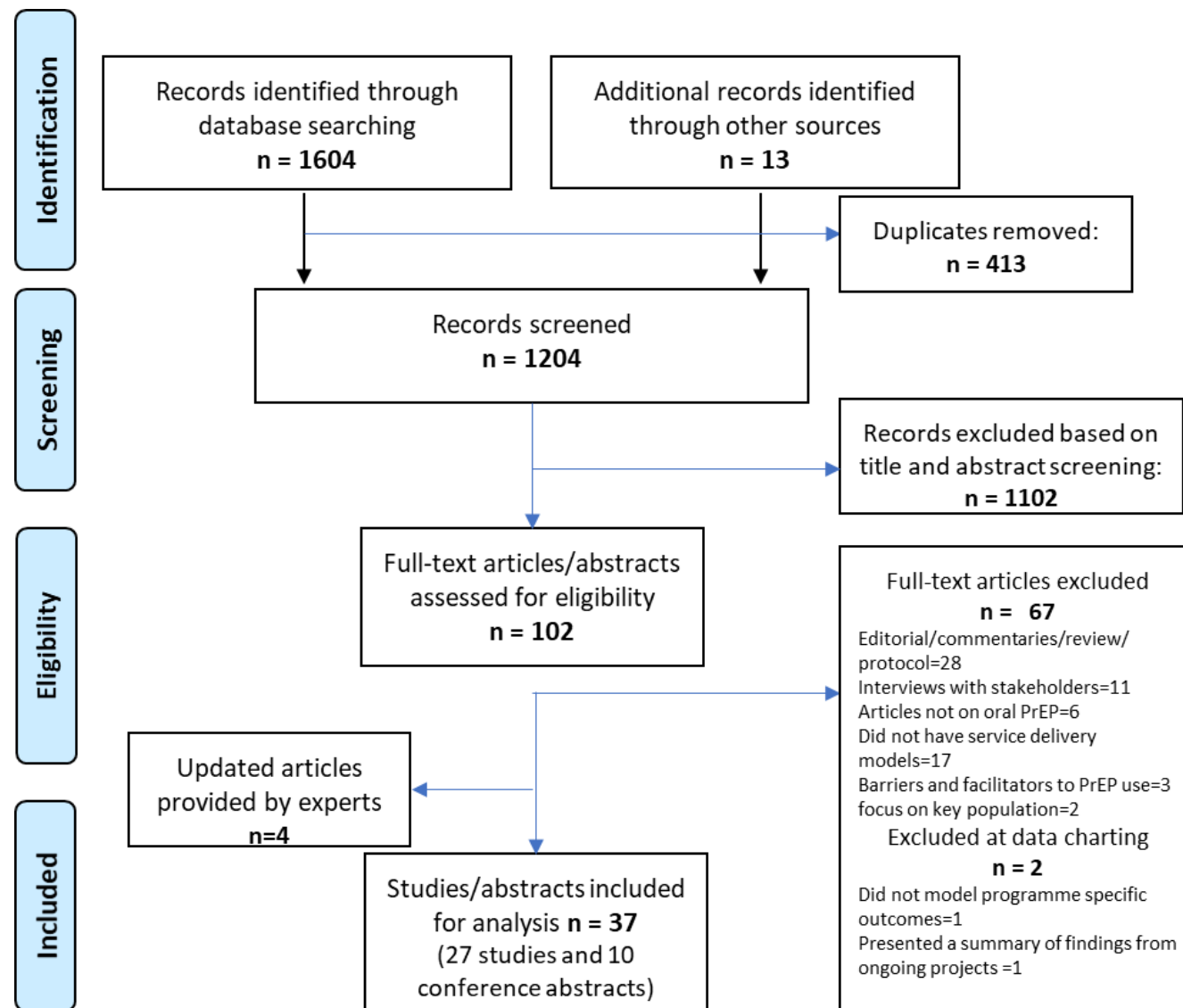
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SET		SEARCH TERMS
1	1 HIV	HIV-1
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3		Hiv
4		Set 1- 3 will be combined with "or"
5	2 Pre-exposure Prophylaxis	PRE-EXPOSURE PROPHYLAXIS
6		Pre-Exposure Prophylaxis
7		PrEP
8		Set 5-7 will be combined with "or"
9		Set 4 and 8 will be combined with "and"
10	3 Linkage to care	service provision
11		service delivery
12		SDMs
13		IMPLEMENTATION SCIENCE
14		model
15		models of care
16		differentiated care
17		linkage
18		linkage to care
19		intervention
20		Set 10-19 will be combined with "or"
21		Set 4, 9 and 20 will be combined with "and"
22	4 Country	DEVELOPING COUNTRY
23		Sub-Saharan
24		AFRICA SOUTH OF THE SAHARA
25		AFRICA
26		<i>All sub-Saharan countries included as MeSH and text term combined with or</i>
27		Set 22-26 will be combined with "or"
28		Set 4, 9, 20 and 27 will be combined with "and"

Service Delivery Modality	Author (Year) and study setting	Publication type and objectives	Study population and Sample	Intervention description	Detailed Description of Findings
Studies among AGYW					
Health facility^a	Maseko et al. (2020) ²⁵ Malawi	Manuscript To understand knowledge of, interest in, concerns about, and delivery preferences for PrEP among AGYW enrolled in the Girl Power study.	Study population: Never been offered to use PrEP services (hypothetical opinions related to PrEP) Sample Sample size (total – N): 40 Gender distribution: Female: 100% Age distribution: 15-19yrs: 21; 20-24yrs: 19	Nature of Intervention: Four models of service-delivery were compared in four separate clinics: Model 1) standard of care (SoC), Model 2) Integrated youth-friendly health services; Model 3) Model 2 plus a small-group behavioural intervention on; and Model 4) Model 3 plus a cash transfer (\$5.50/month). An explanation of PrEP was provided to 40 participants prior to IDI Intervention components: HIV testing, syndromic management of STIs, family planning, and condom distribution. NB: PrEP was not provided in this study, nor was it available in government clinics at the time of the study.	<ul style="list-style-type: none"> • Interest in PrEP based on a belief that their HIV risk exposure was due to factors that were out of their control, including partners having concurrent relationships, challenges with condom negotiation/use, and rape. • Disinterest in PrEP included: perception of low risk because of abstinence or having a single partner, use of PrEP implying infidelity among married AGYW, taking pills daily implying HIV infection. • Interest in initiating PrEP depends upon: <ul style="list-style-type: none"> - ease of accessing PrEP (confidential), - packaging attributes (discrete, cartons, packets, or bottles that would give the appearance of medications for common ailments preferred - delivery context (available in locations frequented by youth such as schools or youth friendly spaces because of ease of access and comfort in the absence of adult patients and family members).
Health facility^b	Mugwanya et al. (2019) ²⁶ Kenya	Manuscript To demonstrate the feasibility of integrating PrEP delivery within routine family planning clinics to reach at-risk AGYW for PrEP in HIV high burden settings.	Study population: Offered to use PrEP services Sample Sample size (total – N): 1271 Gender distribution: Female: 100% Age distribution: Median: 25 (22-29) <20: 105 20-24: 522 25-29: 356 30-34: 172	Nature of Intervention: PrEP-dedicated nurse-led integrated delivery of PrEP in family planning clinics Intervention components: Newly hired nurses were trained on HIV risk assessment, counselling, and PrEP provision. These nurses performed only these duties at the FP clinic. Women attending FP clinics completed other services were then referred to the PrEP-dedicated nurse. This nurse counselled and assessed	<ul style="list-style-type: none"> • Of 1,271 women screened, 22% initiated PrEP, and 41% returned for at least one refill. • PrEP uptake was independently associated with reported male-partner HIV status ($p < 0.001$) and marital status ($p = 0.04$). • More women >24 years (26%) initiated PrEP compared to young women <24 years (16%). • For women >24 years, the likelihood of initiating PrEP increased by about 3% for each additional year of a woman's age ($p < 0.001$).

			≥35: 116	willingness to consider PrEP (guided by a national guidelines and HIV risk assessment screening tool). Interested and medically eligible women were provided same-day PrEP initiation.	<ul style="list-style-type: none"> • FP clinics can be an effective platform to efficiently reach HIV at-risk women who may benefit from PrEP. • Integration of PrEP delivery in FP clinics, makes this a potential "one-stop" location for FP and PrEP. • Although FP visits are busy, efficient implementation strategies such as less frequent PrEP visits and expanding the pool of providers who might be able to screen and provide PrEP beyond the few clinicians and nurses (e.g., training and empowering HIV testing counsellors and community health workers or peer educators) can be built into existing routine services.
Health facility^b	Pintye et al. (2018) ²⁷ Kenya	Manuscript To define approaches for integrating PrEP into routine antenatal and post-natal care (ANC/PNC) using PrIYA Program as a case study.	Study population: Offered to use PrEP services Sample Sample size (total – N): 16 Health facilities; 40 program-supported nurses Gender distribution: Female 100% Age distribution: not described	Nature of Intervention: Nurse-led teams worked with maternal and child health (MCH) staff at 16 public, faith-based, and private facilities to determine optimal clinic flow for PrEP integration into antenatal (ANC) and postnatal (PNC) care. A program-dedicated nurse facilitated integration. Intervention components: All ANC/PNC clients received assessment for behavioural risk (completion of a questionnaire and willingness to consider PrEP, general informational counselling on PrEP depending on the client's awareness and interest in PrEP. Among clients who were willing to initiate PrEP, PrEP counselling also included information on how to use PrEP and adherence as well as medication dispensation.	<ul style="list-style-type: none"> • Clinics developed two approaches for integrating PrEP delivery within ANC/PNC: 1) co-delivery: ANC/PNC and PrEP services delivered by same MCH nurse or 2) sequential services: PrEP services after ANC/PNC by a PrEP-specialized nurse. • 86 ANC/PNC visits were observed. • Clients who initiated PrEP took a median of 18 minutes (IQR 15-26) for PrEP-related activities (risk assessment, PrEP counselling, creatinine testing, dispensation, and documentation) in addition to other routine ANC/PNC activities. • For clients who declined PrEP, an additional 13 minutes (IQR 7-15) was spent on PrEP-related risk assessment and counselling. • PrEP-specific activities took <20 minutes per client, the moderate additional time burden for PrEP initiation in MCH would likely decline with community awareness and innovations such as group/peer counselling or expedited dispensing.
Health facility	Kinuthia et al. (2020) ²⁸ Kenya	Manuscript We implemented and evaluated a novel programme	Study population: Offered to use PrEP services Sample Sample size (total – N): 9376 women	Nature of Intervention: Integration of PrEP into existing structures at 16 maternal and child health clinics (public, faith-based, and private sector) At each facility,	<ul style="list-style-type: none"> • PrEP initiation: 2030 (21.7%) women-initiated PrEP: 79.3% women with partners living with HIV, 37.2% with partners of unknown HIV status, and 11.6% women with HIV-negative partners.

		<p>to provide PrEP in maternal and child health clinics in Kenya</p>	<p>Gender distribution: Female:100% Age distribution: <24: 5033 Median age: 24 years (IQR: 21-28)</p>	<p>they offered sensitisation sessions to introduce the programme, educate facility staff on PrEP, and seek advice on the best way to integrate PrEP delivery at the facility.</p> <p>Intervention components: Programme nurses approached all eligible women provided PrEP counselling as part of routine maternal and child health clinic processes. Risk was assessed using a using a risk assessment tool Women who did not know the HIV status of their partners were offered HIV self-testing kits, if they were willing to test with their partners at home. All women (regardless of risk factors) were informed that PrEP was available if they perceived they were at risk for HIV.</p>	<ul style="list-style-type: none"> • 999 (49.2%) women who initiated PrEP were younger than 24 years • Reasons for initiating PrEP: having a partner living with HIV or of unknown HIV status and feeling at risk for acquiring HIV. Reasons for declining PrEP: need to consult partner and low perceived HIV risk Factors associated with initiation: being younger than 24 years, having a partner living with HIV or of unknown HIV status, gestational age less than 26 weeks among pregnant women, having experienced intimate partner violence in the previous 6 months, or sharing needles while engaging in injection drug use, diagnosed or treated for an STI, forced to have sex, and had recurrently used PEP. • PrEP continuation: 38.7% of 2030 women returned for PrEP refill at least 1 month after initiation • Factors associated with continuation: women with HIV-positive partners. • Reasons for discontinuation: side effects, no longer perceiving HIV risk, and partner known to be HIV-negative. • PrEP refills: 21.7% of women who initiated PrEP at least 3 months before this evaluation returned for PrEP refill. Of these 242 (54.9%) were younger than 24 years and 199 (45.1%) were aged 24 years or older (p=0.05).
<p>Health facility</p>	<p>Pintye et al. (2019)²⁹ Kenya</p>	<p>Conference abstract To understand motivations for early PrEP discontinuation among AGYW and Adolescents (PrIYA) Program</p>	<p>Study population: Offered to use PrEP services Sample Sample size (total – N): 69 AGYW 69 in-depth interviews: 21 AGYW received, but never used PrEP • 24 discontinued PrEP within 1 month • 24 discontinued PrEP within 3 months Gender distribution: Females: 100% Age distribution:</p>	<p>Nature of Intervention: The PrIYA Program provides real world evidence on delivering PrEP to AGYW seeking routine ANC, PNC and family planning (FP) services within 16 MCH clinics in Kisumu County, Kenya Intervention components: N/A AGYW were identified by program nurses and purposively sampled based on 3 categories</p>	<ul style="list-style-type: none"> • Interest in initiating PrEP was heavily influenced by one-on-one interactions with a close friend, relative, or teacher/professor • Early PrEP discontinuation patterns were influenced by side effects (feared or experienced) and important life events AGYW frequently stopped PrEP after childbirth and found it challenging to remember to take PrEP during the complex transition to motherhood • AGYW reported that pre-initiation counselling focused on adherence; many were unaware that they could restart PrEP after stopping

			Age (years) 22 (20-23)		<ul style="list-style-type: none"> • Messaging on stopping/restarting PrEP tailored to life events common among AGYW, such as childbirth and periods away from partners, could promote appropriate PrEP use
Health facility^a	Hill et al (2020) ³⁰ Malawi	Manuscript To understand the level of interest in PrEP among AGYW at highest HIV risk, and the potential role of perceived risk in motivating PrEP interest.	<p>Study population: Never been offered to use PrEP services (hypothetical opinions related to PrEP)</p> <p>Sample <i>Sample size (total – N):</i> 825 <i>Gender distribution:</i> Female: 100% <i>Age distribution:</i> Median: 20 [18 to 22] (range: 15 to 27)</p>	<p>Nature of Intervention: AGYW rated their potential interest in using PrEP after receiving this explanation: "PrEP is a medicine that can be used to prevent HIV for people who are HIV-negative. To be protected with PrEP, a pill is taken every day. These pills contain some of the same medicine used to treat people who already have HIV. PrEP is not currently available in Malawi."</p> <p>Intervention components: participants were enrolled and followed for one year. NB: PrEP was not provided in this study, nor was it available in government clinics at the time of the study.</p>	<ul style="list-style-type: none"> • Epidemiologic risk scores were positively associated with PrEP interest, high numbers of AGYW both above and below the high-risk cut-off were very interested in PrEP (68% vs. 63%). • Perceived risk partially explained the relationship between HIV risk and PrEP interest; greater epidemiologic HIV risk was associated with high perceived risk, which was in turn associated with PrEP interest. • Many more high-risk AGYW were interested in PrEP (68%) than expressed a high level of perceived HIV risk (26%). • High number of participants with risk scores below the high-risk cut-off who both expressed high perceived risk and interest in PrEP suggesting that demand for PrEP among AGYW may not be well aligned with epidemiologic risk
Mobile clinic/health facility^c	Travill et al. (2018) ³¹ Kenya and South Africa	Conference abstract To assess PrEP uptake and sexual behaviour in the POWER cohort.	<p>Study population: Offered to use PrEP services</p> <p>Sample <i>Sample size (total – N):</i> 330 <i>Gender distribution:</i> Female: 100% <i>Age distribution:</i> Median age: 20.5 years (IQR:19-22)</p>	<p>Nature of Intervention: PrEP was integrated with reproductive health services at family planning clinics (Kisumu, Kenya), an adolescent and youth-friendly clinic (Johannesburg, South Africa [SA]) and a mobile van for reproductive health services for youth (Cape Town, SA)</p> <p>Intervention components: PrEP for AGYW</p>	<ul style="list-style-type: none"> • PrEP uptake at the initial visit was 90% across all sites. • Two-thirds (68%) did not know their partners' HIV status and only 4% were in a known sero-discordant relationship. • Main reasons for declining PrEP were fears of HIV stigma or partner reactions • AGYW had evidence of high HIV risk using a risk score, indicating that women initiating PrEP would benefit from it. • AGYW had high willingness to initiate PrEP when delivered in these youth-friendly settings.
Hybrid (community-health facility)^c	Ong'wen et al. (2018) ³² Kenya	Conference abstract To know more about adolescent girls accessing	<p>Study population: Offered to use PrEP services</p> <p>Sample <i>Sample size (total – N):</i> 1851 <i>Gender distribution:</i></p>	<p>Nature of Intervention: PrEP integration through drop-in centres (DICEs), public and private clinics</p> <p>Intervention components:</p>	<ul style="list-style-type: none"> • Among 28,268 clients initiating PrEP, 1851 (6.5%) were adolescent girls • DICEs, clinics designed primarily for sex workers, were the preferred PrEP outlet for adolescent girls, with 66% accessing services in DICEs, 25% accessed

		routine PrEP services in the context of national scale-up programs.	Females: 100% Age distribution: 15-19 years	The adolescents received either static or outreach services from 93 Jilinde supported clinics	PrEP services in public clinics and 9% in private clinics. <ul style="list-style-type: none"> • Entry to PrEP was through peer educators and networks (50%); community outreaches (20%); and within health facilities (30%) • Efforts to make PrEP accessible to AGYW at risk of HIV acquisition should include restructuring the service delivery model
Mobile clinic^c	Rousseau et al. (2019) ³³ South Africa	Conference abstract Hypothesized that contraceptive use was associated with PrEP uptake and continuation in young women accessing sexual and reproductive health services	Study population: Offered to use PrEP services Sample Sample size (total – N): 1096 Gender distribution: Female: 100% Age distribution: 16-25	Nature of Intervention: Contraceptive use associated with PrEP uptake and continuation in AGYW accessing sexual and reproductive health services (SRHS) from a mobile clinic Intervention components: Sexual reproductive health service including HIV testing, contraception (oral, injectable and implant), and PrEP	<ul style="list-style-type: none"> • Among 1096 AGYW who accessed SRHS 31% initiated PrEP on the same day. • AGYW who were using contraception were significantly more likely to initiate PrEP on the same day compared to those who declined PrEP (76% vs 66% on contraception at that visit; p=0.001). • PrEP initiation was also significantly associated with contraception initiation; contraception was initiated by 44% of AGYW on the same day as PrEP initiation compared to 30% contraception starts in AGYW who declined PrEP (p=0.003). • AGYWs contraception use facilitated PrEP initiation and continuation, PrEP initiation also encouraged young women to initiate contraception use supporting the integration of SRHS with the provision of PrEP for AGYW.
Research site	Delany-Moretlwe et al. (2018) ³⁴ South Africa & Tanzania	Conference abstract To evaluate whether empowerment clubs increase PrEP uptake and continuation among AGYW.	Study population: Offered to use PrEP services Sample Sample size (total – N): Female:100% Age distribution: Not mentioned	Nature of Intervention: Participants were randomised to standard of care (SoC), which included comprehensive sexual and reproductive health care, with counselling and SMS reminders for PrEP users, or to empowerment clubs plus SOC. Intervention components: Facilitators-led small group sessions and clinic follow-up visits for sexually active AGYW on PrEP	<ul style="list-style-type: none"> • 431 AGYW enrolled and 213 randomised to clubs • 97% initiated PrEP • PrEP continuation did not vary significantly by study arm (p-value =0.31) • PrEP continuation was 73% at month 1, 61% at month 3 and 34% at month 6. • While PrEP uptake was high in this at-risk population, use diminished with time. Empowerment club participation was low and did not enhance PrEP continuation, contrary to experiences in the HIV treatment field.
Research Site	Donnell et al. (2021) ³⁴	Manuscript To assess the effect of on-site access to	Study population: Offered to use PrEP services Sample	Nature of Intervention: On-site PrEP access at nine trial sites provided by research staff	<ul style="list-style-type: none"> • After on-site PrEP access began 543 (26%) out of 2124 reported PrEP use.

	South Africa	PrEP on HIV incidence.	<p>Sample size (total – N):2121</p> <p>Gender distribution: Female:100%</p> <p>Age distribution: 16-35 years; median age: 23 years (IQR 20-27)</p>	<p>Intervention components: Research nurse provided PrEP</p>	<ul style="list-style-type: none"> • HIV incidence was 2.16% after on-site PrEP access, compared with 4.65% before PrEP access (p=0.0085). • Future studies of HIV prevention should incorporate PrEP as part of the standard of prevention
<p>Hybrid (community-Health facility)</p>	<p>Were et al (2020)³⁵</p> <p>Kenya</p>	<p>Manuscript</p> <p>To describe the programmatic application of an oral PrEP cascade; to quantify progression across each step of the cascade for female sex workers (FSW), MSM and AGYW and, to identify missed opportunities.</p>	<p>Study population: Offered to use PrEP services</p> <p>Sample size (total – N): 299,798</p> <p>Gender distribution: FSW: 211,927, MSM: 47,533 MSM and AGYW: 40,338</p> <p>Age distribution: AGYW: 15-24; FSW >15 years; MSM:>15 years</p>	<p>Nature of Intervention: Scaling up oral PrEP through integration into routine health services in drop-in centres (DICEs), public and private health facilities</p> <p>Intervention components: Individuals enter the PrEP pathway through community mobilization. Individuals who are interested in PrEP are referred to facilities providing PrEP, where they undergo HIV testing services. Clients who screen positive for substantial behavioural risk, or who request PrEP, are referred to an onsite clinician who conducts a clinical assessment and provides PrEP to clients who are eligible and opt-in. Clients are followed-up visit at the same facility one month following initiation and monthly thereafter.</p>	<p>Quantitative:</p> <ul style="list-style-type: none"> • Among PrEP-eligible individuals, 2,900 (11%) AGYW, were initiated on PrEP. Of these clients, whereas 55% of AGYW were between 20 and 24 years. • Majority (81%) of clients-initiated PrEP through DICEs, whereas 14% and 5% were initiated through public and private facilities respectively. • PrEP cascade for AGYW aged 15-19 years: HIV-negative (99%), screened (22%), eligible (36%), initiation (95%), month 1 follow-up (31%), month 3 follow up (5%) • PrEP cascade for AGYW aged 20-24 years: HIV-negative (98%), screened (23%), eligible (34%), initiation (91%), month 1 follow-up (32%), month 3 follow up (5%) • AGYW had higher missed opportunities for screening (78%). Among those screened, a substantially higher proportion of AGYW (65%) were ineligible for PrEP. • Missed opportunities for PrEP initiation was 8% among AGYW. • Majority of AGYW did not persist on PrEP use at month-1 (68%) and month-3 (94%) follow-ups. <p>Qualitative</p> <ul style="list-style-type: none"> • Eligibility for PrEP: Poor rapport between AGYW and providers inhibits disclosure of risk behaviours. Peer mobilization and referral of low-risk individuals coupled with inadequate client education on PrEP. • Initiation of PrEP: Myths and misconceptions about PrEP and low risk perception among FSW, MSM and AGYW. Co-location of both PrEP and

					HIV services in comprehensive care centres (HIV clinics) resulted in PrEP clients feeling stigmatized as HIV positive. Stigma-related discouragement from peers, family and friends for eligible users. Providers reluctance to prescribe PrEP associated with reluctance to increase provider workload; provider belief that client will not adhere to PrEP. Insensitive referral and access pathways in public and private health facilities.
Studies among Men					
Not specified	Bell et al. (2019) ³⁶ South Africa	Conference abstract To understand perceptions of PrEP, and barriers and enablers of uptake among young South African men.	Study population: Never been offered to use PrEP services (hypothetical opinions related to PrEP) Sample Sample size (total – N): 2077 (Quantitative: 2019; Qualitative: 58) Gender distribution: Male: 100% Age distribution: 20-34	Nature of Intervention: Perceptions of PrEP use and barriers and enablers of uptake. 58 IDIs Intervention components: N/A	<ul style="list-style-type: none"> • Enablers to PrEP use: <ul style="list-style-type: none"> - Maintain an HIV-negative status - Avoid conflict and turmoil that HIV diagnosis would bring - High degree of enthusiasm towards the concept • Barriers to PrEP use: <ul style="list-style-type: none"> - Practical: remembering to take the pill daily, side effects and access to clinics. - Knowledge: Had basic information, confused PrEP with PEP - Psychological: perceived as "only for women" and health seeking behaviour is not the norm for men. - Social: Being seen at clinics by community members, as people will assume that they are HIV positive. - Interpersonal: Keep PrEP use a secret from their partners, friends and family.
Studies among AGYW and Men					
Hybrid (research site- health facility)^e	Heffron et al. (2018) ³⁷ Kenya and Uganda	Manuscript To explore fertility intentions, pregnancy, and evaluated the use of PrEP and ART as peri-conception HIV risk reduction strategies.	Study population: Offered to use PrEP services Sample Sample size (total – N): 1013 Gender distribution: HIV-infected females: 455; HIV-uninfected males: 224; HIV infected males: 110; HIV-uninfected females: 224 Age distribution:	Nature of Intervention: The PrEP delivery model integrated PrEP into HIV treatment services. PrEP discontinuation was encouraged once the HIV-infected partner had used ART for at least 6 months (time to achieve HIV viral suppression). Intervention components: Couples-based HIV prevention counselling; safer conception	<ul style="list-style-type: none"> • Uptake and adherence to integrated PrEP and ART strategy was high with an estimated 96% reduction in HIV incidence. • During the 6 months preceding pregnancy, 82.9% of couples used PrEP or ART and there were no HIV seroconversions, 14.5% used some ART and/or PrEP and 2.6% used neither PrEP nor ART. • Among the 81 couples who were using ART only (61 couples with HIV-infected women and 20 with HIV-infected men), 91.2% of the HIV-uninfected partners had discontinued PrEP due to sustained

			HIV-infected females: 26 (22-30); HIV-uninfected males: 30 (26-37); HIV-uninfected females: 29 (24-35); HIV-infected males: 35 (30-42)	counselling or contraceptives; counselling and HIV testing for HIV-uninfected partner; PrEP initiation/prescription and adherence counselling; referral of HIV infected partner for ART	(i.e., [6 months) ART use by their HIV infected partner. <ul style="list-style-type: none"> • Integrated PrEP and ART was readily used by HIV serodiscordant couples. • Widespread scale-up of safer conception counselling and services is warranted to respond to strong desires for pregnancy among HIV-affected men and women.
Hybrid (research site- health facility)^e	Ngure et al. (2016) ³⁸ Kenya	Manuscript To gather insights into couples' decision-making, motivations for PrEP uptake, and experiences soon after PrEP initiation.	Study population: Offered to use PrEP services Sample Sample size (total – N): 40 Gender distribution: Female: 20; Male:20 Age distribution: Females: 29.1 (20-43), Males: 36.6 (27-57)	Nature of Intervention: The PrEP delivery model integrated PrEP into HIV treatment services. PrEP discontinuation was encouraged once the HIV-infected partner had used ART for at least 6 months (time to achieve HIV viral suppression). Intervention components: At the time of interview: time since initiating PrEP was 6.3 months and time since initiating ART was 5.6 months	<ul style="list-style-type: none"> • PrEP offered couples an additional strategy to reduce the risk of HIV transmission, meet their fertility desires, and cope with HIV serodiscordance. • Remaining HIV-negative at follow-up visits reinforced couples' decisions and motivated continued adherence to PrEP. Daily PrEP use supported the HIV-infected partners adherence to ART. • A positive clinical encounter (provider's advice and client-friendly services) motivated initiation and continuation of PrEP
Hybrid (community-health facility)^d	Koss et al. (2018) ³⁹ Kenya and Uganda	Manuscript To report on "early adopters" of PrEP in the Sustainable East Africa Research in Community Health (SEARCH) study in rural Uganda and Kenya. intervention.	Study population: Offered to use PrEP services Sample Population: AGYW Men Sample size (total – N): 4064 Gender distribution: 1934 females 2130 males 48% females 52% males Age distribution:	Nature of Intervention: PrEP education and discussions occurred on arrival at the health campaign, with HIV counsellors and clinicians. During home-based testing, 1 staff member conducted HIV testing and counselling and provided info about PrEP. Intervention components: 1-month community mobilization and sensitization activities on PrEP. PrEP risk score or was administered. Hybrid HIV and multi-disease testing was conducted (health campaigns & home-based) with counselling and health education discussions on PrEP.	<ul style="list-style-type: none"> • Of 21 212 HIV-uninfected adults, 4064 were identified for PrEP (2991 by empiric risk score, 1073 by self-identified risk). • 739 individuals started PrEP within 30 days; 77% on the same day. • Among adults identified by risk score, predictors of early adoption included male sex (adjusted odds ratio 1.53; 95% confidence interval, 1.09-2.15), polygamy (1.92; 1.27-2.90), serodiscordant spouse (3.89; 1.18-12.76), self-perceived HIV risk (1.66; 1.28-2.14), and testing at health campaign versus home (5.24; 3.33-8.26). • Among individuals who self-identified for PrEP, predictors of early adoption included older age (2.30; 1.29-4.08) and serodiscordance (2.61; 1.01-6.76).

<p>1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31</p> <p>Hybrid (community-health facility)^d</p>	<p>Koss et al. (2020)⁴⁰</p> <p>Kenya and Uganda</p>	<p>Manuscript</p> <p>To assess PrEP uptake and engagement after population-level HIV testing and universal PrEP access to characterise gaps in the PrEP cascade</p>	<p>Study population: Offered to use PrEP services</p> <p>Sample</p> <p>Sample size (total – N): 12935 (HIV-negative with elevated risk)</p> <p>Gender distribution: Female: 6459; Male: 6476</p> <p>Age distribution: 15-24: 4800; 25-34: 4712; 35-44: 1927; 45-54: 991; ≥55: 505</p>	<p>Nature of Intervention: Population-level HIV and multi-disease testing using a hybrid mobile testing approach at community health fairs, home-based testing or facilities. PrEP initiation at health fairs or at local clinic.</p> <p>Intervention components:</p> <p>Community: community sensitisation, HIV testing, PrEP counselling to HIV- negative people at elevated risk (serodifferent partnership, risk score, or self-identified risk); on-site PrEP start at health fairs or same-day PrEP initiation at local clinics. Home: home-based testing and PrEP counselling, offer of PrEP through local clinics.</p> <p>Local clinic: Patients with HIV were asked to bring their HIV-negative or partners with unknown HIV status to the clinic for HIV testing and the offer of PrEP initiation.</p> <p>Follow up: visits included supportive delivery system with options for visits at clinic, home, or community locations. Follow up visits included: HCT, PrEP refill blood tests and adherence measurements</p>	<ul style="list-style-type: none"> • In 12935 (10% serodifferent partnership, 54% risk score, 36% self-identified risk) people at elevated risk, 27% initiated PrEP. • 82% initiated PrEP on the same day as HIV testing, 50% of whom were men • 19% of AGYW (15-24 years) initiated PrEP • PrEP uptake was lower among individuals aged 15-24 years and mobile individuals. • At week 4, 64% were engaged in the programme, 49% received medication refills, and 40% self-reported adherence. • At week 72, 56% were engaged, 33% received a refill, and 27% self-reported adherence. • Inclusive risk assessment (combining serodifferent partnership, an empirical risk score, and self-identification of HIV risk) was feasible and identified individuals who could benefit from PrEP. • The biggest gap in the PrEP cascade was PrEP uptake, particularly for young and mobile individuals. •
<p>32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47</p> <p>Hybrid (community-health facility)^d</p>	<p>Mayer et al. (2019)⁴¹</p> <p>Uganda</p>	<p>Manuscript</p> <p>To estimate the association between distance to clinic and other transportation-related barriers on PrEP uptake and initial clinic visit</p>	<p>Study population: Offered to use PrEP services</p> <p>Sample</p> <p>Sample size (total – N): 701</p> <p>Gender distribution: Female: 300; Male: 401</p> <p>Age distribution: 15-24: 339; 25-34: 242;</p>	<p>Nature of Intervention: PrEP was given using a hybrid model and initiation was dependent on participant choice. PrEP could be initiated same day on-site at community health fairs or at local clinic). For those tested at home PrEP was offered within one to six months following the community campaign through local clinics.</p>	<ul style="list-style-type: none"> • Of the 701 PrEP-eligible participants, 39% started PrEP within four weeks; of these, 17% were retained at four weeks. • Participants with a distance to clinic of ≥2 km were less likely to start PrEP (p = 0.012) and less likely to be retained on PrEP once initiated (p = 0.024) • Eligible participants (from home-based testing) who did not have the option of same-day PrEP initiation were also less likely to initiate PrEP (p < 0.001).

			35-44:77; 45-54: 991; ≥45: 43	Intervention components: Meetings with community stakeholders to sensitise them on PrEP, at community health campaigns (CHCs), eligible HIV-negative participants at elevated risk (serodifferent partnership, risk score, or self-identified risk) were directed to a PrEP education station where they were informed about how PrEP works, interested participants were offered referral to a linkage station to make an appointment at clinic for PrEP enrolment or same-day PrEP start or a clinic appointment at a later date.	<ul style="list-style-type: none"> Barriers to PrEP use: daily use of PrEP, "low/no risk of getting HIV, transportation-related barriers (clinic is too far away and travel away from home).
Hybrid (community-health facility)^d	Camlin et al. (2020) ⁴² Kenya and Uganda	Manuscript To explore understandings of PrEP, elucidate factors influential of demand, decisions around PrEP uptake or non-initiation, and adherence and discontinuation in population subgroups at elevated HIV risk.	Study population: Offered to use PrEP services Sample Sample size (total – N): 111 Gender distribution: Females: 65; Males: 46 Age distribution: 15-35, median age: 24 (range 17-35)	Nature of Intervention: Same day PrEP initiation on-site at community health campaigns or at health facilities. 8 FGDs (4 male, 4 female groups) each with 8-12 participants; 13 IDIs with PrEP initiators and 10 IDIs with PrEP decliners Intervention components: As per SEARCH study: Same day initiation of PrEP on-site at community health campaigns or health facilities. Transport to clinics for the PrEP initiation visit. Follow-up visits which occurred at local health facilities, participants' homes, or other community-based locations of the participant's choice.	<ul style="list-style-type: none"> Gendered motivations for PrEP: young men viewed PrEP as a means to safely pursue multiple partners, while young women saw PrEP as a means to control risks in terms of engagement in transactional sex and difficulty in negotiating condom use and partner testing. Uptake was hindered by HIV/ART-related stigma (colour of pill same as ART, accessing PrEP at the same facility where HIV care was provided), the need for partners permission, distance to facilities, mixed messaging on the dosing of PrEP, taking daily medications, living with parents or were attending school, moral prohibitions against sex among young people, desire for "proof" of efficacy by peers Uptake was motivated by high perceived HIV risk, and beliefs that PrEP use supported life goals (completing schooling or having a family). Discontinuation of PrEP was due to dissolution of partnerships/changing risk, unsupportive partners/peers, or early side effects/pill burden.
Hybrid (community)	Koss et al. (2017) ⁴³	Conference abstract	Study population: Offered to use PrEP services (nested in SEARCH Trial)	Nature of Intervention: This is a cross sectional study based on SEARCH trial	<ul style="list-style-type: none"> In communities that were offered targeted PrEP in this population-based study, multi-level barriers to the uptake of PrEP were identified.

<p>y-health facility ^d</p>	<p>Kenya and Uganda</p>	<p>To evaluate barriers to the uptake of open-label PrEP offered in a population-based context in high HIV prevalence settings.</p>	<p>Sample Population: Men. Women and youth Sample size (total – N): 63 Community members: 40% men; 35% women; 25% youth 42 Clients who did not initiate PrEP: 38% women; 45% at risk for HIV by empiric score Gender distribution: 16-53 years, median age of 28 years Age distribution: 40% men, 35% women, 25% youth</p>	<p>Intervention components: n/a Intervention delivery setting: n/a</p>	<ul style="list-style-type: none"> - In addition to barriers identified in prior studies of targeted populations, such as aspects of pill-taking, concerns about effectiveness, and partner and household--level influence, concerns about access to PrEP via health facilities or at school, opportunity costs, mobility, and misconceptions about PrEP as barriers to uptake in SEARCH communities. • Strategies are needed to address these barriers, such as community sensitization, expanded provision of information on PrEP, and community---based delivery mechanisms to facilitate access to PrEP.
<p>Hybrid (community-health facility)</p>	<p>Gombe et al. (2020)⁴⁴ Zimbabwe</p>	<p>Manuscript To understand the factors that motivate clients to accept, decline, continue, or discontinue PrEP.</p>	<p>Study population: Offered to use PrEP services Sample Sample size (total – N): 60 Gender distribution: Female: 46; Male: 14 Age distribution: 16-25: 20%; 26-40: 60%; >41: 20%</p>	<p>Nature of Intervention: PrEP was integrated at two family planning clinics. 54 IDIs with PrEP acceptors and 6 IDIs with PrEP decliners Intervention components: HIV testing; screening for PrEP eligibility according to a tool; same day initiation of PrEP (one-month supply); follow-up visit at month 1 (three-month supply)</p>	<ul style="list-style-type: none"> • Motivators to accept PrEP: High HIV risk perception, preference for PrEP over other HIV prevention methods, perceived severity of living with HIV, confidence in PrEP • Barriers to accepting PrEP: fear of pill burden or impact of pills, wanting partners consent or fearing partner reaction to PrEP, feeling satisfied with current method of HIV prevention • Motivators to continue PrEP: focus on original motivation, establishing daily pill routine, accessible PrEP pill storage, planning ahead before travelling out of town, partner or facility support - Barriers to continuing PrEP: being unaccustomed to taking pills, religious issues, travel out of town, clinic schedule/hours, lack of transport funds, misunderstanding dosing guidance, side effects
<p>Health facility</p>	<p>Sack et al (2020)⁵¹ Mozambique</p>	<p>Manuscript To explore the perspectives, attitudes, and experiences of HIV serodiscordant partners taking</p>	<p>Study population: Offered to use PrEP services Sample Sample size (total – N): 20 Gender distribution: Female: 11; Male: 9 Age distribution: Median age 35, interquartile range</p>	<p>Nature of Intervention: Stories will be presented to discordant couples to try to improve PrEP uptake and reduce incident HIV infections. Intervention components: Three oral stories designed to educate, empower, and normalize PrEP use.</p>	<ul style="list-style-type: none"> • Individual factors influencing PrEP uptake and adherence: love for one's partner, knowledge about PrEP and the belief it is effective, fear of HIV and PrEP stigma • Interpersonal factors affecting PrEP uptake: desire to protect family, partner support and relationship

		PrEP and develop a messaging campaign to improve PrEP uptake in rural Mozambique to reduce HIV transmission among serodiscordant partners.	26.5-37.5). Female: median age 32, interquartile range 25.5-36; male: median age 36, interquartile range 31-38.		strength, Overcoming the fear of stigma to seek support from family and friends
Community	Bassett et al. (2018) ⁴⁵ South Africa	Manuscript To assess the acceptability and feasibility of offering family planning and HIV prevention services at salons.	Study population: Never been offered to use PrEP services (hypothetical opinions related to PrEP) Sample Population: 17 hair salons, 92 stylists, 326 clients Sample size (total – N): Salons (N = 17), Owners (N = 17), Stylists (N = 92), Female clients (N = 326) Gender distribution: 100% of salon clients were female 82% of stylists were female 65% of owners were female Age distribution: Median age (IQR): Salon clients: 28 (IQR 24 to 33); Stylists: 29 (26-32) Owners: 36 (33-43)	Nature of Intervention: n/a Intervention components: n/a Intervention delivery setting: n/a	<ul style="list-style-type: none"> Overall, most owners, stylists, and clients were willing to receive contraception and PrEP from a nurse in hair salons in and around Umlazi Township. Frequent client visits and willingness of stylists to offer health education suggest that a stylist initiated, nurse-supported health intervention could be feasible in the salon setting. Hair salons represent a promising venue for reaching young women in sub-Saharan Africa at risk of unintended pregnancy and HIV infection.
Community	Bassett et al. (2019) ⁴⁶ South Africa	Manuscript To assess the acceptability of nurse-offered contraceptive and PrEP services at	Study population: Never been offered to use PrEP services (hypothetical opinions related to PrEP) Sample Population:	Nature of Intervention: n/a Intervention components: n/a Intervention delivery setting: n/a	<ul style="list-style-type: none"> Participants felt that incentives would be beneficial to program enrolment, if not necessary, to garner interest among clients. One client noted that incentives have become an expected part of research Overall, participants liked the idea of receiving personal SMS messages and having WhatsApp

		<p>hair salons in Durban, South Africa.</p>	<p>Clients of hair salons- Females, mean age 27 years, hair salon owners, hair stylists Sample size (total – N): Clients=42 (all female) Stylists=43 (40 female; 3 male) Salon owners=10 (8 female; 2 male) Gender distribution: Clients: 42 Females Stylists: 40 Females; 3 Males Owners: 8 Females; 2 Males Age distribution: Clients: M=27.1; SD=6.3 Stylists: M=29.6; SD=5.1 Owners: M=40.3; SD; 7.6</p>		<p>groups as adherence supports. Clients preferred SMS messages for direct adherence motivation because they are more private.</p> <ul style="list-style-type: none"> • One client felt that an SMS could also serve as an automated daily reminder for women on PrEP to take their medication. A few participants also noted that SMS would be more accessible than WhatsApp given data constraints. • Overall, participants were enthusiastic about the program. Convenience and a conducive environment were noted as facilitators to receiving health services in the hair salon; attention will have to be directed to establishing privacy and program legitimacy. • Hair salons represent an innovative venue for reaching young women at high-risk for unintended pregnancy and HIV infection.
<p>Community</p>	<p>Lubwama et al. (2019)⁴⁷ Uganda</p>	<p>Conference abstract A review of PrEP data from PEPFAR Data for Transparency Impact Monitoring (DATIM) for July 2017 to June 2018</p>	<p>Study population: Offered to use PrEP services Sample Population: Key populations including sex workers (SW), men who have sex with men (MSM), transgender persons (TG) and other high-risk groups (fisher folk [FF], discordant couples [DC], truckers, adolescent girls and young women [AGYW] and people who inject drugs). Sample size (total – N): Initiated PrEP (6 sites) 3,846 PrEP clients (1 community): 1538 Gender distribution: Not mentioned Age distribution: Not mentioned</p>	<p>Intervention components: Drop-in centres (DINCs), Community based outreach centres</p>	<ul style="list-style-type: none"> • 3,846 individuals-initiated PrEP; 2,568 (67.2%) SW, 327 (8.5%) MSM, 15 (0.4%) TG, and 918 (23.8%) other high-risk groups • One community had 1538 PrEP clients: 58.1% SW, 25.4% FF, 7.4% DC and 0.5% MSM. • Return rates for PrEP were higher among DC (3 months:56.9%, 6 months:46.8%) and low among SW (3 months 37.5%, 6 months 26.3%) and FF (3months 16.4%, 6months 14.2%). • The majority (69.2%, 1064/1538) were reached through outreach models versus fixed public health facilities • More SW than other KP and high-risk groups were reached with PrEP. Retention at 3 and 6 months was low for sex workers and fisherfolk, somewhat higher for discordant couples. • Outreach approaches should be scaled up to reach more KP clients with PrEP. Retention strategies should be strengthened, especially for sex workers and fisherfolk, who may be highly mobile.

<p>Community</p>	<p>Morton et al (2020)⁴⁸</p> <p>South Africa</p>	<p>Manuscript</p> <p>To understand how to effectively create awareness, stimulate interest, and increase uptake of PrEP.</p>	<p>Study population: Never been offered to use PrEP services (hypothetical opinions related to PrEP)</p> <p>Sample Sample size (total – N): 385 Quantitative: 320 Qualitative: 28 key stakeholders; 11 PrEP-naïve young, 10 PrEP-experienced women, five older women living with HIV, four men, seven key informants</p> <p>Gender distribution: Female 100% in household surveys</p> <p>Age distribution: Quantitative: 20 (18, 23) Qualitative: PrEP-naïve young women (aged 16-25), PrEP-experienced women (aged 16-29), older women living with HIV (aged 26-32), men (aged 25-35)</p>	<p>Nature of Intervention: Young women were shown a 90-second PrEP demand creation video and two informational brochures and then asked to self-administer a short survey that included questions on demographics, sexual relationships, risk taking, HIV risk perception, PrEP interest and knowledge, and their opinions about the video..</p> <p>Intervention components: Research staff visited houses up to three times, requesting to speak with the young woman household resident. Young women who agreed to participate were shown the video and then asked to self-administer a short survey.</p>	<p>Quantitative</p> <ul style="list-style-type: none"> • Most reported interest in learning more about PrEP (67.7% 'definitely interested' and 9.4% 'somewhat interested') and taking PrEP (56.4% 'definitely interested' and 12.5% 'somewhat interested'). • Factors significantly associated with interest in taking PrEP were having a primary partner with whom they regularly have sex (80.0% vs. 65.2% without a primary partner; adjusted odds ratio (AOR)=3.1, 95% CI: 1.3, 7.0) and being in a sexual partnership for <6 months (86.8% vs. 68.5% for >12 months; AOR=3.0, 95% CI: 1.2, 7.3).
<p>Research site</p>	<p>Heffron et al. (2018)⁴⁹</p> <p>East Africa</p>	<p>Manuscript</p> <p>To present estimates of effectiveness and patterns of PrEP use within a two-year demonstration project of PrEP for HIV- negative members of heterosexual HIV serodiscordant couples in East Africa.</p>	<p>Study population: Offered to use PrEP services</p> <p>Sample Population: Serodiscordant couples Sample size (total – N): 1010 couples Gender distribution: Males: 1010 Females 1010 Age distribution: HIV-: Age, years 30 (26, 36) HIV+: Age, years 28 (23, 35)</p>	<p>Nature of Intervention: PrEP was offered at enrolment at research site to all HIV-negative participants as PrEP with a daily dosing schedule; participants electing not to initiate PrEP at enrolment were offered PrEP initiation at subsequent visits</p> <p>Intervention components: N/A</p> <p>Intervention delivery setting: Research site</p>	<ul style="list-style-type: none"> • 97% of HIV-negative partners-initiated PrEP. • Median duration of PrEP use was 12 months (IQR 6-18) • Adherence: 71% of HIV-negative participants took ≥80% of expected doses • 95% reduction (95% CI 86-98%, p<0.0001) in HIV incidence, relative to estimated HIV incidence for the population in the absence of PrEP integrated into HIV treatment services.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15	Research site^e	Ware et al. (2018) ⁵⁰ Uganda	Manuscript To evaluate the integrated strategy of delivering PrEP & ART to find out why it was successful.	Study population: Offered to use PrEP services Sample Sample size (total – N): 93 couples Gender distribution: Female HIV-uninfected partner: (46%) Age distribution: HIV uninfected partner: 31 (26 to 37) HIV infected partner 31 (25 to 37)	Nature of Intervention: The integrated strategy offered time-limited PrEP to uninfected partners as a "bridge" to long-term ART in the infected partner. Uninfected partners were offered PrEP at baseline and encouraged to discontinue once infected partners had used ART for six months. Intervention components: PrEP was integrated with ART	<ul style="list-style-type: none"> • Couples viewed in services as hope for staying together, attending joint follow up appointments together increased mutual support, and travelling and waiting room time provided an opportunity for discussion, reflection and joint decision making. • Concern for partner wellbeing was a reason for initiating ART whilst the simultaneous use of ARVs turned management of HIV into a shared experience • Couples devised joint strategies for adhering to PrEP and ART such as mutual reminders and emotional and material support for adherence.
16 17 18 19 20 21 22 23 24 25 26 27 28 29 30	Research site	Atujuna et al. (2018) ⁵¹ South Africa	Manuscript To explore acceptability and preferences for New biomedical prevention technologies (NPTs) among key and other vulnerable populations in two South African townships.	Study population: Never been offered to use PrEP services (hypothetical opinions related to PrEP) Sample Sample size (total – N) Adolescents=14 Gender distribution: Heterosexual women=10 Heterosexual men=9	Nature of Intervention: n/a Intervention components: n/a Intervention delivery setting: n/a	<ul style="list-style-type: none"> • Different product preferences and motivations emerged by population based on similarity to existing practices and contexts of vulnerability. • Adult women and female adolescents preferred a vaginal ring and HIV vaccine, motivated by longer duration of protection to mitigate feared repercussions from male partners, including threats to their marriage and safety, and a context of ubiquitous rape. • Male adolescents preferred an HIV vaccine, seen as protection in serodiscordant relationships and convenient in obviating the HIV stigma and cost involved in buying condoms. • Adult men preferred PrEP, given familiarity with oral medications and mistrust of injections, seen as enabling serodiscordant couples to have a child.
31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47	Research site^e	Baeten et al. (2016) ⁵² Kenya and Uganda	Manuscript To understand the delivery feasibility and uptake of, as well as adherence to, an integrated package of ART and PrEP among high-risk heterosexual HIV-	Study population: Offered to use PrEP services Sample Sample size (total – N) 1013 serodiscordant couples Gender distribution: HIV-1-uninfected partner Male: 679 (67%) Age distribution: HIV-1-uninfected partner Age <25 y=207 (20%),	Nature of Intervention: HIV- partners were offered PrEP which was provided at the study sites, as PrEP was not available otherwise in Kenya and Uganda during the study period. ART was offered at the study site or by referral to another HIV-1 care center of their choice Intervention components:	<ul style="list-style-type: none"> • ART was initiated by 789 (78%) HIV-1-infected partners. • 960/1 013 (95%) HIV-uninfected partners-initiated PrEP at enrolment, and 2% initiated PrEP at a later visit. • Among those initiating PrEP at enrolment and attending the month 1 and 3 visits, 840 (97%) and 792 (94%) continued to receive PrEP. • Adherence to PrEP measured by pill counts of returned, unused pills, indicated that 95% of

		1-serodiscordant couples	HIV-1-infected partner Age <25 y= 317 (31%)	<ul style="list-style-type: none"> - Couples were offered antiretroviral medications - Counselling on HIV-1 prevention benefits PrEP discontinued 6 months after the infected partner initiated antiretroviral treatment	dispensed pills had been taken as expected and 88% of periods between study visits had adherence >80%. <ul style="list-style-type: none"> • 14 initially HIV-1-seronegative partners seroconverted during follow-up (12 were infected at the time of study enrolment).
Research site	Heffron et al. (2019) ⁵³ Kenya	Manuscript To determine uptake, use and effectiveness of a comprehensive safer conception intervention among HIV-serodiscordant couples with immediate fertility desires.	Study population: Offered to use PrEP services Sample Population: Serodiscordant couples Sample size (total – N): 74 Gender distribution: HIV-negative females/HIV positive males= 54%	Nature of Intervention: Couples attended monthly visits at the study clinic prior to pregnancy and quarterly visits during pregnancy. Couples were followed for 12 months or until the end of pregnancy. During all visits, couples received counselling about HIV prevention, information about how to track women's menstrual cycles and identify peak fertility days and how to conduct vaginal self-insemination Intervention components: The intervention package included antiretroviral therapy (ART) for HIV-positive partners, oral pre-exposure prophylaxis (PrEP) for HIV-negative partners, daily fertility and sexual behaviour tracking via short message service (SMS) surveys, counselling on self-insemination, and referrals for voluntary medical male circumcision and fertility care.	<ul style="list-style-type: none"> • Of the 74 enrolled couples, 54% were HIV-negative female/HIV-positive male couples. • Prior to pregnancy, 100% of partners living with HIV used ART and 100% of HIV-negative partners-initiated PrEP. • One-month preceding pregnancy, 80.9% of HIV-positive partners were virally suppressed and 81.4% of HIV-negative partners were highly adherent to PrEP. • 42.6% pregnancies were protected using all four strategies i.e., men were circumcised, high adherence to PrEP, ART and timed condomless sex. • In addition to male circumcision, seven pregnancies (14.9%) were also protected by high adherence to PrEP and ART, 5 (10.6%) were protected by PrEP and timed condomless sex. • 0 HIV seroconversions (95% CI 0.0 to 6.0 per 100-person years) were observed indicating a 100% reduction in HIV risk (p = 0.04).
Research Site	Minnis et al (2020) ⁵⁴ South Africa	Manuscript Examined youths' preferences for key attributes of long-acting PrEP, with a focus on characteristics pertinent to product	Study population: Never been offered to use PrEP services (hypothetical opinions related to PrEP) Sample Sample size (total – N): 807 Gender distribution: Female: 401 (50%);	Nature of Intervention: Participants were asked to choose between two hypothetical PrEP products composed of five attributes product form (injection, implant); dosing frequency (two, six or twelve months); where to obtain the product (clinic, pharmacy, community distribution, mobile clinic - all	<ul style="list-style-type: none"> • All three subgroups had strong preference for a product with a one-year duration over two months (p < 0.001). • MSW placed the most importance on dosing frequency, with it being five times more important than any other attribute. • Females had greater preference for a single injection over an implant compared to MSW (p ≤ 0.004).

		delivery alongside key modifiable product attributes.	Men who have sex with women only (MSW): 216 (27%). Men who have sex with men MSM): 190 (23%) Age distribution: Median age (IQR): Female: 21 (19 to 22); men who have sex with women only: 21 (19 to 22) men who have sex with men: 20 (19 to 22)	models for current HIV prevention and contraceptive service delivery); pain involved with injection or insertion (mild, moderate) and delivery location on the body (arm, buttock, thigh). Intervention components: Participants completed interviews on a tablet computer. The survey first introduced each attribute individually with both visual and narrative descriptions. Participants were then presented with nine DCE choice questions, each one a unique choice NB: PrEP was not provided in this study.	<ul style="list-style-type: none"> • Females and MSW expressed more preference for two injections compared with implants ($p \leq 0.009$). • Females preferred using a product that was offered at a health clinic over accessing it at a pharmacy ($p < 0.001$). • All youth preferred product insertion in the arm ($p < 0.001$). • Females disliked insertion in the thigh and both MSW and MSM disliked insertion on the buttocks ($p = 0.01$). • Youth indicated strong preferences for longer duration products. <p>Each attribute nonetheless influenced preferences, offering insight into trade-offs that inform long-acting PrEP development.</p>
Other					
Not described	Jani et al. (2018) ⁵⁵ Tanzania	Conference abstract To describe support for PrEP use among male partners of AGYW in Tanzania via a qualitative comparative analysis of AGYW's and male partners of AGYW's views	Study population: Never been offered to use PrEP services (hypothetical opinions related to PrEP) Sample Sample size (total – N): not described Gender distribution: not described Age distribution: not described	Nature of Intervention: Prior to IDIs and FGDs participants were acquainted with PrEP, by sharing a visual, standardized script of PrEP information with them. 24 IDIs and 4 FGDs with AGYW; 16 IDIs with men Intervention components: PrEP for AGYW	<ul style="list-style-type: none"> • AGYW and male partners agreed that most male partners would be willing to support PrEP use by AGYW. • However, male partner support might be contingent on their early involvement in the decision-making process regarding PrEP. • Early inclusion was perceived to remove suspicion of infidelity and alleviate negative consequences associated with late or inadvertent disclosure of PrEP use. • AGYW suggested potential social harms (relationship dissolution, loss of financial support, and verbal and physical violence) if male partners are not involved whilst male partners denied such potential extreme consequences. • Male participants recommended strategies on gaining men's support of PrEP including providing education to men on PrEP, equipping AGYW with skills to educate their partners, couples counselling by providers, provision of PrEP for men, and community education and sensitization.

					<ul style="list-style-type: none"> Educating male partners about PrEP and engaging them in implementation activities should be part of PrEP roll-out strategies for AGYW.
Not described	Makyao et al. (2018) ⁵⁶ Tanzania	Conference abstract To explore how social norms and gendered parenting roles might influence parental support of AGYW's PrEP use.	Study population: Never been offered to use PrEP services (hypothetical opinions related to PrEP) Sample Sample size (total – N): 55 Gender distribution: Female parents: 28; Male parents: 27 Age distribution: not described	Nature of Intervention: Prior to IDIs and FGDs participants were acquainted with PrEP, by sharing a visual, standardized script of PrEP information with them. 4 FGDs with male parents and 4 FGDs with female parents Intervention components: PrEP for AGYW	<ul style="list-style-type: none"> Parents supported PrEP availability recognizing AGYW's high risk of HIV due to limited power to negotiate preventative behaviours and frequent violence in sexual relationships. Differential parenting roles influenced the type of support. Men noted shame and embarrassment in communicating with their daughters about relationships and sex. Social norms around adolescent sexuality influenced parental support. Parents were wary of being viewed as condoning pre-marital sexual activity, while they worried that AGYW could be stigmatized as promiscuous. Parents recommended strategies for supporting their daughters PrEP use included: creating a supportive environment for PrEP use (e.g., ensuring good diet) while male parents described offering logistical and material support (e.g., providing transport to health centres).
n/a (modelling)	Cremin et al. (2015) ⁵⁷ Mozambique	Manuscript The aim of this paper is to estimate the prevention impact and the cost effectiveness of providing time-limited PrEP to partners of migrant miners in Gaza, Mozambique.	Study population: Never been offered to use PrEP services (hypothetical opinions related to PrEP) Sample Population: adult heterosexual Sample size (total – N): Note mentioned (modelling) Gender distribution: N/A Age distribution: N/A	Nature of Intervention: n/a Intervention components: n/a Intervention delivery setting: n/a	<ul style="list-style-type: none"> Providing time-limited PrEP to partners of migrant miners in Gaza Province during periods of increased exposure would be a novel strategy for providing PrEP. This strategy would allow for a better prioritized intervention, with the potential to improve the efficiency of a PrEP intervention considerably, as well as providing important reproductive health benefits
n/a Modelling	Irungu et al. (2019) ⁵⁸ Kenya	Manuscript To provide estimates of the cost of delivering	Study population: Never been offered to use PrEP services (hypothetical opinions related to PrEP) Sample	Nature of Intervention: n/a Intervention components: n/a	<ul style="list-style-type: none"> Time-limited provision of PrEP to the HIV uninfected partner within HIV serodiscordant couples can be an affordable delivery model implemented in HIV care programs in Kenya and

		antiretroviral-based HIV prevention to HIV serodiscordant couples in public health facilities in Kenya and the incremental cost of providing PrEP as a component of this strategy.	<p>Population: Heterosexual couples</p> <p>Sample size (total – N): N/A</p> <p>Gender distribution: none provided</p> <p>Age distribution: No age disaggregation</p>		similar settings. These costs can be used for budgetary planning and cost effectiveness analyses.
n/a Modelling^e	Ngure et al. (2020) ³⁰ Kenya and Uganda	Manuscript To estimate the associations between effective contraceptive use and 1) PrEP dispensation 2) high effective PrEP use	<p>Study population: Offered to use PrEP services</p> <p>Sample Population: Sample size (total – N): 311</p> <p>Gender distribution: Female: 100%</p> <p>Age distribution: Median age: 29 years ([IQR] 24.0-35.0)</p>	<p>Nature of Intervention: HIV-uninfected women were provided with both PrEP and effective contraception</p> <p>Intervention components: PrEP was integrated with ART</p>	<ul style="list-style-type: none"> • PrEP dispensation was more frequent among those concurrently using effective contraception, (adjusted relative risk [aRR]=1.19; 95% confidence interval [CI]=1.08-1.32) and contraceptive use was more common among those on PrEP (aRR=1.63; 95% CI=1.18-2.25). • Healthcare delivery models that integrate the provision of family planning and PrEP may successfully promote both preventive products, especially long-acting contraception

a. Conducted in the context of the Girl Power study b. Conducted in the context of the PrEP Implementation in Young Women and Adolescents (PrYA) study c. Conducted in the context of the Prevention Option for Women Evaluation Research (POWER) project d. Conducted in the context of the Sustainable East Africa *Research* in Community Health (SEARCH) study e. Implemented within The Partners Demonstration Project

Author	Item										11
	1	2	3	4	5	6	7	8	9	10	
Qualitative studies using the CASP Tool ²²											
Atujuna et al., 2018 ⁵¹	+	+	+	+	+	+	+	+	+	+	
Bassett et al., 2019 ⁴⁶	+	+	+	?	+	?	+	+	+	+	
Bell et al., 2019 ^{36*}	+	+	+	?	?	-	-	?	-	?	
Camlin et al., 2020 ⁴²	+	+	+	+	+	+	+	+	+	+	
Gombe et al., 2020 ⁴⁴	+	+	?	?	+	+	+	+	+	+	
Jani et al., ⁵⁵	+	+	+	?	?	-	?	?	+	?	
Makyao et al., ⁵⁶	+	+	+	?	?	-	-	?	?	?	
Maseko et al., ²⁵	+	?	-	-	+	?	-	+	?	?	
Ngure et al., 2016 ³⁸	+	+	+	+	+	+	+	+	+	+	
Pintye et al., 2019 ²⁹	+	+	+	?	+	?	?	?	+	+	
Ware et al., 2018 ⁵⁰	+	+	+	+	+	?	+	?	?	?	
Morton et al., 2020 ^{48*}	+	+	+	+	+	-	+	?	+	+	
Were et al., 2020 ^{35*}	+	+	+	+	+	+	+	+	+	+	
Sack et al., 2021 ⁵¹	+	+	+	+	+	+	+	+	+	+	
Comparative studies including randomised trials, nonrandomised trials, interrupted time series and controlled-before after studies using the EPOC tool ²¹											
Delany-Moretlwe et al., 2018 ³⁴	?	?	+	?	?	?	?	?	?		
Koss et al., 2018 ³⁹	-	?	+	+	?	+	+	+	+		
Donnell et al., 2021 ³⁴	?	?	+	+	?	?	?	+	+		
Studies involving descriptions of interventions, implementation or policy processes with very limited empirical data and other non-conventional sources using the WEIRD tool ²³											
Baetan et al., 2016 ⁵²	+	+	+	!	+	N/A	!	+	+	+	+
Bassett et al., 2018 ⁴⁵	+	+	?	+	+	+	?	+	+	+	+
Bell et al., 2019 ^{36*}	!	-	-	?	?	?	?	-	?	-	-
Heffron et al., 2018 ⁴⁹	+	?	!	?	?	+	?	+	+	+	+
Heffron et al., 2018 ³⁷	+	!	!	!	-	!	?	?	?	+	+

Kinuthia et al.,2020 ²⁸	+	+	+	!	?	N/A	!	!	!	+	+
Koss et al., 2020 ⁴⁰	?	?	?	?	?	?	?	?	?	?	?
Koss et al.,2017 ⁴³	-	-	-	-	-	+	?	?	+	?	-
Lubwama et al., 2019 ⁴⁷	-	+	-	?	N/A	!	-	-	?	+	-
Mayer et al.,2019 ⁴¹	+	+	+	+	+	N/A	!	+	+	+	+
Mugwanya et al.,2019 ²⁶	+	+	?	?	!	!	!	!	!	+	!
Ongwen et al.,2019 ³²	!	!	?	!	+	N/A	!	-	!	?	-
Pintye et al.,2018 ²⁷	+	!	!	!	?	?	?	!	!	?	?
Rousseau et al.,2019 ³³	?	?	?	?	?	?	?	?	?	?	?
Travill et al.,2018 ³¹	!	?	?	!	?	?	?	-	-	-	-
Hill et al.,2020 ³⁰	+	+	+	+	+	+	+	+	+	+	+
Morton et al.,2020 ^{48*}	+	+	+	+	+	+	+	+	+	!	+
Minnis et al.,2020 ⁵⁴	+	+	+	+	+	+	+	+	+	+	+
Were et al.,2020 ^{35*}	+	+	+	+	+	+	+	+	+	+	+

+=Yes/Low risk/No or very minor concerns; -=No/High risk/Serious concerns'; ?=Can't tell/Unclear risk/Moderate concerns; !=Minor concerns

*Mixed methods study, Modelling studies were not appraised

Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) Checklist

SECTION	ITEM	PRISMA-ScR CHECKLIST ITEM	REPORTED ON PAGE #
TITLE			
Title	1	Identify the report as a scoping review.	1
ABSTRACT			
Structured summary	2	Provide a structured summary that includes (as applicable): background, objectives, eligibility criteria, sources of evidence, charting methods, results, and conclusions that relate to the review questions and objectives.	2
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of what is already known. Explain why the review questions/objectives lend themselves to a scoping review approach.	3-5
Objectives	4	Provide an explicit statement of the questions and objectives being addressed with reference to their key elements (e.g., population or participants, concepts, and context) or other relevant key elements used to conceptualize the review questions and/or objectives.	5
METHODS			
Protocol and registration	5	Indicate whether a review protocol exists; state if and where it can be accessed (e.g., a Web address); and if available, provide registration information, including the registration number.	6
Eligibility criteria	6	Specify characteristics of the sources of evidence used as eligibility criteria (e.g., years considered, language, and publication status), and provide a rationale.	6-7
Information sources*	7	Describe all information sources in the search (e.g., databases with dates of coverage and contact with authors to identify additional sources), as well as the date the most recent search was executed.	7
Search	8	Present the full electronic search strategy for at least 1 database, including any limits used, such that it could be repeated.	7
Selection of sources of evidence†	9	State the process for selecting sources of evidence (i.e., screening and eligibility) included in the scoping review.	7
Data charting process‡	10	Describe the methods of charting data from the included sources of evidence (e.g., calibrated forms or forms that have been tested by the team before their use, and whether data charting was done independently or in duplicate) and any processes for obtaining and confirming data from investigators.	7
Data items	11	List and define all variables for which data were sought and any assumptions and simplifications made.	7
Critical appraisal of individual sources of evidence§	12	If done, provide a rationale for conducting a critical appraisal of included sources of evidence; describe the methods used and how this information was used in any data synthesis (if appropriate).	7



SECTION	ITEM	PRISMA-ScR CHECKLIST ITEM	REPORTED ON PAGE #
Synthesis of results	13	Describe the methods of handling and summarizing the data that were charted.	8
RESULTS			
Selection of sources of evidence	14	Give numbers of sources of evidence screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally using a flow diagram.	8-9
Characteristics of sources of evidence	15	For each source of evidence, present characteristics for which data were charted and provide the citations.	9-28
Critical appraisal within sources of evidence	16	If done, present data on critical appraisal of included sources of evidence (see item 12).	29
Results of individual sources of evidence	17	For each included source of evidence, present the relevant data that were charted that relate to the review questions and objectives.	29-33
Synthesis of results	18	Summarize and/or present the charting results as they relate to the review questions and objectives.	29-33
DISCUSSION			
Summary of evidence	19	Summarize the main results (including an overview of concepts, themes, and types of evidence available), link to the review questions and objectives, and consider the relevance to key groups.	33-36
Limitations	20	Discuss the limitations of the scoping review process.	36
Conclusions	21	Provide a general interpretation of the results with respect to the review questions and objectives, as well as potential implications and/or next steps.	36
FUNDING			
Funding	22	Describe sources of funding for the included sources of evidence, as well as sources of funding for the scoping review. Describe the role of the funders of the scoping review.	37

JBI = Joanna Briggs Institute; PRISMA-ScR = Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews.

* Where *sources of evidence* (see second footnote) are compiled from, such as bibliographic databases, social media platforms, and Web sites.

† A more inclusive/heterogeneous term used to account for the different types of evidence or data sources (e.g., quantitative and/or qualitative research, expert opinion, and policy documents) that may be eligible in a scoping review as opposed to only studies. This is not to be confused with *information sources* (see first footnote).

‡ The frameworks by Arksey and O'Malley (6) and Levac and colleagues (7) and the JBI guidance (4, 5) refer to the process of data extraction in a scoping review as data charting.

§ The process of systematically examining research evidence to assess its validity, results, and relevance before using it to inform a decision. This term is used for items 12 and 19 instead of "risk of bias" (which is more applicable to systematic reviews of interventions) to include and acknowledge the various sources of evidence that may be used in a scoping review (e.g., quantitative and/or qualitative research, expert opinion, and policy document).

From: Tricco AC, Lillie E, Zarin W, O'Brien KK, Colquhoun H, Levac D, et al. PRISMA Extension for Scoping Reviews (PRISMA-ScR): Checklist and Explanation. *Ann Intern Med.* 2018;169:467–473. doi: [10.7326/M18-0850](https://doi.org/10.7326/M18-0850).



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Service delivery models that promote linkages to PrEP for adolescent girls and young women and men in sub-Saharan Africa: A scoping review

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Title

Service delivery models that promote linkages to PrEP for adolescent girls and young women and men in sub-Saharan Africa: A scoping review

Authors

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Abstract

Background: Pre-exposure prophylaxis (PrEP) is an emerging biomedical prevention intervention. Documenting PrEP service delivery models (SDMs) that promote linkage to and continuation of PrEP will inform guidelines and maximise roll out.

Objectives: To synthesize and appraise the effectiveness and feasibility of PrEP SDMs designed to promote linkage to PrEP care among adolescent girls and young women (AGYW) and men in sub-Saharan Africa (SSA).

Eligibility criteria: Primary quantitative and qualitative studies published in English and conducted in SSA were included. No restrictions on the date of publication were applied.

Sources of evidence: Methodology outlined in the Joanna Briggs Institute reviewers' manual was followed. PubMed, Cochrane library, Scopus, Web of Science, and online-conference abstract archives were searched.

Charting methods: Data on article, population, intervention characteristics and key outcomes was charted in REDCap.

Results and Conclusion: Of the 1204 identified records, 37 met the inclusion criteria. Health facility-based integrated models of PrEP delivery with family planning, maternal and child health or sexual and reproductive services to AGYW resulted in PrEP initiation of 16-90%. Community-based drop-in centres (66%) was the preferred PrEP outlet for AGYW compared to public clinics (25%) and private clinics (9%). Most men preferred community-based delivery models. Among individuals who initiated PrEP, 50% were men, 62% were <35 years old and 97% were tested at health fairs compared to home testing. Integrated antiretroviral therapy (ART)-PrEP delivery was favoured among serodiscordant couples with 82.9% of couples using PrEP or ART with no HIV seroconversions. PrEP initiation within healthcare facilities was increased by perceived client-friendly services and non-judgmental healthcare workers. Barriers to PrEP initiation included distance to travel to and time spent at health facilities and perceived community stigma. PrEP SDMs for AGYW and men need to be tailored to the needs and preferences for each group. Programme implementers should promote community-based SDMs to increase PrEP initiation among AGYW and men.

Key words: Pre-exposure prophylaxis, PrEP, linkage, adolescent girls, and young women, AGYW, men, sub-Saharan Africa

Strengths and limitations of this study

- A comprehensive search strategy was developed, and the search was carried out across multiple databases and conference archives.
- The methodology used in the scoping review was robust and included double data screening, extraction, and synthesis.
- All included studies underwent critical appraisal of sources of evidence using approved tools.
- Studies not conducted in SSA and that were published in non-English languages were excluded.
- Most of the included studies were from Kenya, Uganda, and South Africa limiting the generalizability of the results.

Background

Recent reports indicate a decline in new HIV infections globally. However, this decline is occurring at a slower pace in regions with generalized HIV epidemics such as sub-Saharan Africa (SSA). In 2017, SSA accounted for 64% of new HIV infections globally.¹ Two underserved populations that are critical to drive the decline in new HIV infections are adolescent girls and young women (AGYW; 15-24 years) and men (25-65 years). AGYW are at substantial risk for HIV-infection with an estimated 310 000 new infections globally in 2018 – 86% of which was in SSA.¹ Men, on the other hand, account for more AIDS-related deaths globally than women – 400 000 deaths in men in 2018 compared to 270 000 in woman.¹

For differing reasons, AGYW and men show lower health seeking behaviour because of interpersonal and structural factors. AGYW's access to health services is limited by stigma, negative attitudes from healthcare workers and inconvenient clinic operating hours.² However, 'man unfriendly clinics' are characterised by inaccessible clinic hours/locations, difficulty in engaging with female staff, and gender norms that discourage men from accessing health services.^{3 4}

Amongst the 2020 Global Prevention Targets and Commitments is the reduction in the number of AGYW newly infected with HIV globally to below 100 000, and to ensure that 3 million people at substantial risk of contracting HIV have access to pre-exposure prophylaxis (PrEP).⁵ To achieve these targets, primary prevention programmes should be structured around five central pillars: (1) combination prevention for AGYW; (2) combination prevention with key populations; (3) voluntary medical male circumcision (VMMC) and sexual and reproductive health services (SRHS) for men and boys; (4) comprehensive condom

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3 programmes; and (5) rapid introduction of PrEP.⁵ PrEP for HIV refers to the use of
4 antiretroviral drugs among HIV-negative people to prevent the acquisition of HIV.⁶
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7 PrEP has shown effectiveness in reducing HIV acquisition among couples, sex workers, men
8 who have sex with men (MSM), transgender and people who inject drugs and AGYW.⁷ The
9 impact of PrEP on the HIV epidemic depends on the extent of PrEP initiation among people
10 at substantial risk for HIV infection (World Health Organization (WHO) defined substantial risk
11 of HIV acquisition as HIV incidence of 3 per 100 person-years or higher in the absence of
12 PrEP).^{7,8} Since September 2015, the WHO recommended offering oral PrEP to every person
13 at substantial risk of contracting HIV.⁷ In the current South African guidelines for PrEP, specific
14 populations considered to be at substantial risk of HIV infection include AGYW, MSM, people
15 with more than one sexual partner, people who inject drugs, people with a recent history of
16 sexually transmitted infections, people who recognise their own risk and request PrEP,
17 serodiscordant couples if the HIV positive partner is not virally suppressed, and sex
18 workers.^{9,10}
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26 Literature on PrEP has largely been focused on knowledge, attitudes, and interest in PrEP. As
27 countries scale up use of PrEP as part of their combination prevention packages, evidence on
28 service delivery models (SDMs) that promote initiation and continuation on PrEP are needed
29 especially among vulnerable and hard to reach populations such as AGYW and men. HIV
30 prevention cascades have been proposed as a logical framework to monitor populations at
31 substantial risk for HIV acquisition as they navigate the steps from HIV testing to assessing the
32 risk of the individual to determining PrEP eligibility before PrEP initiation and continuation or
33 discontinuation.⁸ PrEP initiation (step 5) represents a critical step in the PrEP cascade (Figure
34 1),^{8,10} because it reflects people's awareness and interest in lowering their risk for HIV.
35 Differentiated models, which are centred around clients' needs and expectations and
36 relieving unnecessary burdens on the health system while targeting behavioural and
37 structural determinants of AGYW and men, can potentially increase acceptability and
38 accessibility of PrEP. These include innovative strategies that streamline HIV testing, link
39 AGYW and men to HIV prevention services, provide differentiating medication access points,
40 reduce stigma and barriers of parental consent for PrEP initiation.¹¹ PrEP SDMs should be
41 designed with the populations being served central to the design.¹²
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[Insert Figure 1 here]

Figure 1: Oral PrEP cascade: *Adapted from Dunbar et al (2018)*⁸

Following an HIV-negative diagnosis (step 1), an individual is assessed for risk of HIV (step 2). An individual at substantial risk of HIV acquisition or who requests pre-exposure prophylaxis (PrEP) is assessed for eligibility for PrEP (step 3). After documenting eligibility for PrEP use, several baseline clinical investigations are conducted (step 4 PrEP is initiated (step 5) on the same-day as HIV testing. The recommended regimen is Tenofovir (TDF) / emtricitabine (FTC) 1 tablet by mouth daily. PrEP continuation visits (step 6) include: month 1, every 3 months. PrEP is discontinued (step 7) if the individual tests HIV positive, develops renal disease, is non-adherent, does not want or need PrEP, no longer meets eligibility criteria, or if there are safety concerns.

There is a gap in knowledge on the characteristics of AGYW and men who initiate PrEP compared to those who do not initiate PrEP. This information is critical for informing national policies and implementation guidelines for PrEP roll-out. As such, the aim of this review was to synthesize and appraise the effectiveness and feasibility of PrEP SDMs designed to promote linkage to care among AGYW and men eligible for PrEP in SSA. The objectives were to a) summarize SDMs that promote PrEP initiation and b) explore users' perceptions, and barriers and facilitators of these PrEP models.

Methods

We used a scoping review design to map existing literature, explore the research studies conducted and identify research and knowledge gaps in models used to deliver PrEP.¹³ Scoping reviews can be of particular use when the topic has not yet been extensively reviewed or is of a complex or heterogeneous nature.¹⁴ The research question was defined using the Population- Intervention-Comparison-Outcome (PICO) framework (Table 1). We defined our outcomes as i) Linkage to PrEP care (defined as the proportion of AGYW or men who are initiated on PrEP following an HIV-negative diagnosis, step 7 of Figure 1) and ii) perceptions, barriers, and facilitators of PrEP SDMs. The service delivery model was defined as the setting used for delivery of PrEP viz. facility-only, community-only, research-only, mobile-only and a hybrid model encompassing two or more of the above settings.

Table 1: Scoping review population, intervention, and outcome

Population	Heterosexual females (15-24 years) and men (25-65 years)
Intervention	Interventions (SDMs) designed to improve PrEP initiation
Comparison	Not applicable
Outcome	Linkage to PrEP care (defined as the proportion of AGYW or men who are initiated on PrEP following a HIV-negative diagnosis) and perceptions on SDMs

Protocol and registration

This review was conducted and reported in line with the Joanna Briggs Institute (JBI) reviewer's manual and structured using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for scoping reviews (PRISMA-ScR).^{15 16} A review protocol for this scoping review was registered with the Open Science Framework (DOI 10.17605/OSF.IO/EG9TD).

Research ethics approval

The scoping review focuses on published research in the public domain therefore no ethics approval is required.

Patient and public involvement

No patients or public were involved in the study.

Eligibility criteria

We included primary studies on PrEP service delivery models for AGYW and men, with both qualitative and quantitative study designs published in English and conducted in SSA. No restrictions on the date of publication were applied. Table 2 details the inclusion criteria applied to studies. We excluded studies that were focused exclusively on key population groups in HIV programmes such as lesbian, gay, bisexual, MSM etc. and publication types (e.g., systematic reviews, case studies, etc).

Table 2: Eligibility criteria describing study inclusion criteria for the scoping review

Study type	Quantitative studies including randomized clinical trials (RCT), quasi-randomized, and non-RCTs, longitudinal observational (historical cohorts, prospective cohorts, case-control, and before-and-after studies), analytic cross-sectional studies, and non-comparative studies
	Qualitative studies using any study design
Population	Study population included heterosexual females (15-24 years) and males (25-65 years)
Outcomes	Focus of research: PrEP SDMs i.e., service provision / implementation science / models of care / differentiated care / linkage to care / intervention
	Papers reporting on barriers and facilitators of PrEP SDMs
	Papers on user perceptions of PrEP SDMs
Setting	Sub-Saharan African countries – based on the World Bank's country classification ¹⁷

Information sources and search strategy

PubMed, Cochrane library, Scopus, and Web of Science including three online conference archives (AIDS conference, Conference on Retroviruses and Opportunistic Infections and International AIDS Society Conference on HIV Science) were searched. The reference list of systematic reviews was checked to identify relevant primary studies. The three-step search strategy recommended by the JBI Reviewer's Manual was used.¹⁵ During the first step, one author (WC) conducted an elementary search on PubMed to establish the volume of relevant articles on the topic. Two authors (WC and TR) then screened the title and abstract of the retrieved articles to identify keywords and index terms which were used to build a search strategy (see online supplementary appendix 1). The final search results were exported into EndNote,¹⁸ and duplicates were removed.

Selection of sources of evidence

Titles and abstracts were double screened in Rayyan¹⁹ by any two of a group of eight independent authors (TR, WC, KJ, NJ, DG, TMA, MH, ET). There was no restriction placed on age range during the screening phase to ensure that articles with age disaggregated analysis were included. Full text articles and conference abstracts, including articles from the 2020 AIDS conference were retrieved and independently double screened by WC and TR.

Data charting process and data items

Using a pre-designed data-charting form, key and relevant information were systematically extracted from full-text articles in REDCap²⁰ by any two of a group of ten independent authors (TR, WC, TMA, NJ, DG, BZ, CM, MH, ET, EN). We charted data on article characteristics, population characteristics, intervention characteristics, and key outcomes (Table 1).

Critical appraisal of individual sources of evidence

Information for quality assessment was incorporated into the data charting form on REDCap.²⁰ Due to the different study designs and research methodologies adopted in the included studies, we used three different tools to appraise the articles. For comparative studies including randomised trials, non-randomised trials, interrupted time-series and controlled before-after-studies, we used the risk of bias criteria recommended by the Effective Practice and Organisation of Care (EPOC).²¹ For qualitative studies, we used the Critical Appraisal Skills Programme (CASP) checklist.²² For other studies we used the Ways of Evaluating Important and Relevant Data (WEIRD) tool.²³ Modelling studies were excluded from the appraisal step.

Analysis

For quantitative studies we used a narrative analysis and tabulated data by gender and by SDM. We summarized the settings, populations, and sample for each group, along with the interventions and findings. For qualitative studies, we did a thematic analysis that resulted in

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3 organising the data into themes, authors' interpretations, and quotes and integrated these
4 findings to support the quantitative data. We tabulated the data by SDMs (health facility,
5 community, research, or mobile) and by population (AGYW only, men only, or models for
6 both). Furthermore, we determined the existing gaps in the different categories of
7 interventions that can be strengthened to promote initiation and continuation on PrEP among
8 AGYW and men.
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12 13 **Results**

14 **Selection of sources of evidence**

15 Our search identified 1604 citations. After duplicates (413) were removed, a total of 1204
16 titles and abstracts were identified from searches of electronic databases and 13 from other
17 sources including conferences. The PRISMA flow diagram (Figure 2) illustrates the screening
18 process to identify records that meet the study inclusion criteria. Based on the screening of
19 title and abstracts, 1102 records were excluded, with 102 full text articles and conference
20 abstracts to be retrieved and assessed for eligibility. From the review of full text articles 67
21 were excluded for the following reasons: editorials/commentaries/reviews/protocols,
22 interviews with stakeholders, articles on topical PrEP, wrong outcome and focus on key
23 populations. During data charting, two additional articles were excluded. Four additional
24 articles were added after the initial search process, these articles were identified following
25 the 2020 AIDS conference in July. The final number of studies that were considered eligible
26 for this scoping review were 37 (27 studies and 10 conference abstracts).
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35 **[Insert Figure 2 here]**

36 **Figure 2:** PRISMA flow diagram

37 Adapted from: Moher et al²⁴

38 **Description of sources of evidence**

39 A description of the characteristics, setting, SDMs and intervention modalities of the included
40 studies are provided in online supplementary appendix 2. There was a mixture of quantitative
41 (n=23), qualitative (n=11) and mixed method studies (n=3). Most studies were
42 demonstration/IS projects (n=10) while other methodological approaches included
43 randomised controlled trials (RCTs) (n=5) and cross-sectional studies (n=5). Most were
44 conducted in Kenya (n=17), with the remainder conducted in Uganda (n=10), South Africa
45 (n=10), Tanzania (n=3), Malawi (n=2), Mozambique (n=2), and Zimbabwe (n=1). These studies
46 reported evidence on the following PrEP SDMs; health facility (6), mobile (1), research site
47 (8), community (6), hybrid (10), and not described/not applicable (6). Thirteen studies focused
48 on AGYW, 19 studies focused on AGYW and men, one study focused on men only, and four
49 were classified as other (i.e., age categories were not specified). PrEP services were offered
50 in 25 of the 37 studies whilst PrEP perceptions/opinions were assessed in the other 12 studies.
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Critical appraisal of evidence

Full text articles appraised using the WEIRD tool were mostly assessed as having either no or very minor or moderate concerns for items that were unclear in the article (see online supplementary appendix 3). Most of the qualitative studies or abstracts performed well on all items except on items 4 (the recruitment strategy was appropriate to the aims), 8 (the rigour of the data analysis) and 10 (the value of the research in terms of its contribution to the literature and/or policy and process). Due to limited information in the abstracts to clearly answer the items using the WEIRD tool, most of the abstracts were appraised as either having an unclear or serious risk of bias.²⁵⁻³⁰

Results of sources of evidence

PrEP SDMs for AGYW

Amongst AGYW, PrEP SDMs were found in HF-B (n=6), hybrid (mobile clinic-healthcare facility or community-healthcare facility, n=3), research site (n=2) and mobile clinic (n=1) (see online supplementary appendix 2).

Health facility

Three studies from Kenya evaluated a HF-B delivery modality by integrating PrEP delivery into routine services. Mugwanya et al.³¹ evaluated a PrEP-dedicated nurse-led integrated delivery of PrEP in family planning (FP) clinics whilst Kinuthia et al. and Pintye et al. evaluated approaches to integrate PrEP into maternal and child health (MCH) clinics providing antenatal care (ANC) and post-natal care (PNC).^{32 33} Integration of universal screening and counselling for PrEP in FP and MCH clinics resulted in PrEP initiation of 16% and 49.2% respectively among AGYW. Younger women (≤ 24 years) who initiated PrEP at MCH clinics were significantly more likely to return for a PrEP refill at month 3 compared to women >24 years (54.9% versus 45.1%) ($p=0.05$).³² These studies utilised nurses dedicated to providing PrEP services only, which may limit applicability in a sub-Saharan setting where facilities have a limited clinical workforce. A study by Ngunjiri et al. which integrated PrEP with FP services found that PrEP dispensation was more frequent among those concurrently using effective contraception, (adjusted relative risk [aRR]=1.19; 95% confidence interval [CI]=1.08-1.32) and contraceptive use was more common among those on PrEP (aRR=1.63; 95% CI=1.18-2.25), highlighting the importance of SDMs that integrate PrEP with FP services.³⁴ Pintye et al. found that participants who initiated PrEP at MCH clinics took an additional 18 minutes for PrEP related activities over and above the time spent at the clinic to receive routine MCH services. The additional time could deter AGYW from initiating and continuing PrEP and depending on healthcare facility size and patient volume integrating PrEP into these routine services could result in several additional hours of work for nurses.³³ A recent study in Malawi comparing four SDMs (Model 1: standard of care, Model 2: integrated youth-friendly services, Model 3: Model 2 plus a small-group behavioural intervention, and Model 4: Model 3 plus cash transfer) found that PrEP initiation will best be promoted in youth-friendly locations such as

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3 schools because of ease of access and comfort in the absence of adult patients and family
4 members.
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6 Hybrid (community-health facility)

7 Two studies evaluated the scaling up of PrEP in Kenya through integration into routine health
8 services in drop-in centres (DICES), public and private health facilities designed primarily for
9 sex workers.^{28 35} Ongwen et al. reported that within the context of the Jilinde project, which
10 implements oral PrEP as a routine service at a public health scale in Kenya, 6.5% (n=1851)
11 AGYW initiated PrEP, and DICES were the preferred PrEP outlet for adolescent girls with 66%
12 accessing services in DICES, 25% in public clinics and 9% in private clinics. Amongst AGYW who
13 initiated PrEP, the entry channel into the PrEP pathway was through peer educators and
14 networks (50%); community outreaches (20%); and within health facilities (30%).²⁸ Were et
15 al. found that among all individuals eligible for PrEP in the study which included female sex
16 workers and MSM, 11% of AGYW initiated PrEP.³⁵ The majority (81%) of clients initiated PrEP
17 through DICES, whereas 14% and 5% were initiated through public and private facilities
18 respectively. The majority of AGYW did not persist on PrEP use at month-1 (68% drop off) and
19 month-3 (94% drop off) follow-ups. Qualitative evidence from this study found that AGYW
20 who initiated PrEP in public and private health facilities reported insensitive referral and
21 access to the PrEP delivery pathways where "*The (HIV) testing place is different from the place*
22 *I was asked questions and the place for collecting the medicine is also different. We took long*
23 *because we were walking form one place to another*".³⁵
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33 Research site

34 Delany-Moretlwe conducted an RCT in Tanzania and South Africa to evaluate whether
35 empowerment clubs increased PrEP initiation and continuation among AGYW. Participants
36 were randomised to the standard of care (SoC), which included comprehensive SRHS, with
37 counselling and short message service (SMS) reminders for PrEP users, or to empowerment
38 clubs plus SoC. Facilitators-led small group sessions and clinic follow-up visits for sexually
39 active AGYW on PrEP. Across both arms, 97% initiated PrEP. PrEP continuation did not vary
40 significantly by study arm and diminished with time (73% at Month-1, 61% at Month-3 and
41 34% at Month-6).³⁶ Donnell et al. found that HIV incidence declined significantly after on-site
42 provision of PrEP at the research sites.³⁷ Hill et al. found that epidemiologic HIV risk scores
43 were positively associated with PrEP interest, and that high numbers of AGYW both above
44 and below the high-risk cut-off were very interested in PrEP (68% vs. 63%).³⁸
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51 Mobile

52 A South African study found that integrating PrEP with SRHS and delivering it via an
53 adolescent-friendly mobile clinic led to an increase in both PrEP initiation and contraception.
54 AGYW who were using contraception were significantly more likely to initiate PrEP (76%) on
55 the same-day compared to those who were not using contraception and declined PrEP (66%)
56 (p=0.001). Contraception was initiated by 44% of AGYW on the same-day as PrEP initiation
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3 compared to 30% who declined PrEP ($p=0.003$).²⁹ No qualitative evidence on the acceptability
4 and feasibility of mobile delivery models were identified.
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7 **Overall perceptions of SDMs by AGYW**

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9 In a study conducted in Malawi, Maseko et al found high levels of hypothetical PrEP
10 acceptability among AGYW who reported that interest in PrEP depends on confidential access
11 and discrete packaging (cartons or bottles that resemble treatment for common ailments) of
12 the drug. Moreover, AGYW reported that youth-friendly delivery modalities such as schools
13 and youth-friendly sections of health centres that provide “...a place for the youths to be
14 comfortable getting these drugs...” may facilitate the initiation of PrEP as a prevention
15 strategy.³⁹
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20 **PrEP SDMs for men**

21 We found one mixed method study among young South African men. PrEP was not provided,
22 but hypothetical perceptions, barriers and enablers of PrEP initiation were assessed. Whilst
23 only 11% of men were aware of PrEP, 62% reported that they were very likely to take it. The
24 young men preferred to keep PrEP use a secret from their partners, friends, and family. PrEP
25 initiation was also dependent on the SDM used. Receiving PrEP from the clinic was reported
26 as a barrier to PrEP usage as this could incite community stigma. Young men reported that
27 “...they (community) would immediately think that you are HIV positive already, not that you
28 are taking the prevention one...”
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34 **PrEP SDMs for AGYW and men**

35 We found 19 studies that assessed various SDMs for linkages to PrEP for AGYW and men.
36 Amongst AGYW and men, PrEP SDMs included hybrid (research site-healthcare facility or
37 community-healthcare facility, $n=8$), community ($n=5$) and research site ($n=6$). These studies
38 either recruited serodiscordant couples or included AGYW and men as individual participants.
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43 Hybrid

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45 We identified seven studies that used a hybrid model to deliver PrEP.⁴⁰⁻⁴⁶
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48 One study from Kenya and Uganda by Heffron et al. involved a hybrid (research site- health
49 facility) model that integrated PrEP delivery into antiretroviral therapy (ART) treatment
50 services for high-risk HIV serodiscordant couples.⁴⁰ The intervention was mainly couples-
51 based and involved HIV prevention counselling; safer conception counselling or
52 contraceptives; counselling and HIV testing for HIV-negative partner; PrEP
53 initiation/prescription; and referral to a local health facility for the HIV infected partner for
54 ART. The results showed high uptake of integrated PrEP and ART with an estimated 96%
55 reduction in HIV incidence (82.9% of couples used PrEP or ART and there were no HIV
56 seroconversions, 14.5% used some ART and/or PrEP and 2.6% used neither PrEP nor ART).⁴⁰
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3 Qualitative evidence that explored HIV serodiscordant couple's decision-making and
4 motivations to initiate PrEP through this integrated ART-PrEP approach showed that a positive
5 clinical encounter with a healthcare provider and client-friendly services played a critical role
6 in the couple's decisions to initiate and continue PrEP.⁴⁵ Clear messaging, in-depth
7 counselling and friendly, non-judgmental/stigmatizing services provided by healthcare
8 workers empowered, reassured and promoted PrEP initiation among HIV serodiscordant
9 couples with some describing it as "*service beyond the medicine*".⁴⁵ Furthermore, being at a
10 place where service is offered to both couple (ART for the HIV positive partner and PrEP for
11 the HIV-negative partner) motivated their decision.⁴⁵
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17 Five studies used a hybrid mobile testing approach implemented at community health fairs,
18 home, or local health facility.^{26 41-44} Two studies from Kenya and Uganda showed that PrEP
19 initiation was high (>75%) among individuals who received HIV testing on the same-day.^{41 43}
20 Mayer et al. found that 39% of participants initiated PrEP within 4 weeks of the community
21 health campaign.⁴² However, the distance between the participants and the healthcare
22 provider influenced PrEP initiation.
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27 Koss et al. and Camlin et al. who explored barriers influencing PrEP initiation using the hybrid
28 (community-health facility) model,^{26 44} found that PrEP initiation was hindered by HIV/ART-
29 related stigma which emanated from the colour of the pill being the same as HIV treatment
30 regimens, and access of PrEP services at the same facility where HIV care is provided.⁴⁴ Men
31 reported that the "*... majority of us fear to go to the health center...*" and suggested
32 alternatives such as designating a clinic day for PrEP or "*...distribute [PrEP] to the people...*".
33 Participants reported that healthcare workers should deliver PrEP or find delivery methods
34 that are easily accessible by the community "*...just like they did with condoms.*" Young adults
35 who attended school outside the community could not initiate PrEP given that PrEP was only
36 provided within study communities. Furthermore, school attendance made initiating and
37 continuing PrEP challenging.^{26 44}
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44 Community

45 Two South African studies conducted in a community setting explored the hypothetical
46 opinions of PrEP among salon owners, stylists, and clients.^{47 48} Ninety-five percent of owners
47 and stylists and 77% of clients were comfortable with PrEP being offered at hair salons,⁴⁸
48 which provide a geographically convenient and conducive environment for receiving health
49 services.^{47 48} A third community-based study which used a 90-second PrEP demand creation
50 video and informational brochures, found that 68% and 56% of young women respectively
51 reported that they were definitely interested in learning more about and initiating PrEP. The
52 study also found that young women preferred realistic visuals that they could identify with,
53 rather than highly stylized models. Data evaluated by Lubwama et al. showed that 69.2% of
54 key populations which included AGYW and serodiscordant couples were reached through
55 drop-in centres and community-based outreach centres providing PrEP versus fixed public
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3 health facilities.⁴⁹ The proportion that returned for PrEP was higher among serodiscordant
4 couples (3 months: 56.9%, 6 months: 46.8%) compared to sex workers (3 months: 37.5%, 6
5 months: 26.3%).
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8 9 Clinical Research Site

10 In three of the six studies conducted at a clinical research site,^{27 40 50-54} PrEP was integrated
11 with ART or with ART and other interventions such as VMMC.^{40 51 52} Across the three studies,
12 $\geq 95\%$ of the HIV-negative partner within serodiscordant couples initiated PrEP. The use of
13 PrEP in combination with ART or other prevention interventions (VMMC) or conception
14 strategies resulted in reduced HIV incidence. Serodiscordant couples found that the “couples-
15 focused” services provided through the integrated PrEP-ART strategy strengthened their
16 relationships. Serodiscordant couples found that the “couples-
17 focused” services provided through the integrated PrEP-ART strategy strengthened their
18 relationships.
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20 21 **Overall perceptions of SDMs by AGYW and men**

22 Several studies explored factors that influence PrEP initiation, non-initiation and
23 discontinuation in individuals who received PrEP through the different SDMs.^{26 27 44-46 54}
24 Motivators to initiate PrEP included: perception of high-risk, preference of PrEP over other
25 HIV prevention methods, protection from unwanted/forced sexual encounters, love for one's
26 partner, knowledge about PrEP and the belief it is effective, partner support belief that PrEP
27 supported life goals and a positive clinical encounter.^{26 27 44-46 54 55} Females preferred a product
28 that was delivered at a health clinic over accessing it at a pharmacy.⁵⁶ Barriers to PrEP
29 initiation included daily pill burden, side effects, mixed dosing messaging, living with parents
30 or attending school, partners consent or partners reaction to use and HIV-related stigma.^{26 27}
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38 39 **Other models**

40 We identified four other studies that explored other methods of promoting PrEP initiation
41 among AGYW and men.⁵⁷⁻⁶⁰ Jani et al. explored male partners support for hypothetical PrEP
42 use by AGYW.⁵⁹ Male partners highlighted that their support would be contingent on their
43 early involvement in the decision-making process regarding PrEP which would alleviate
44 suspicion of infidelity. AGYW suggested that not including male partners may result in social
45 harms (partner violence, dissolution of relationships). Strategies recommended by male
46 partners included couples counselling, educating, and providing PrEP to men and community
47 sensitization. Makyao et al. explored parental support of AGYW's hypothetical use of PrEP.
48 Parents supported PrEP availability acknowledging the risks faced by AGYW.⁶⁰ However,
49 support was also influenced by social norms (promoting promiscuity or condoning sexual
50 activity). Differential parenting roles influenced the type of support: mothers suggested
51 providing a conducive environment (good diet) for PrEP use whilst fathers suggested
52 providing operational support (transport money). Cremin et al. and Irungu et al. reported that
53 providing time-limited PrEP during periods of increased exposure would be a novel, efficient
54 and cost-effective strategy for providing PrEP.^{57 58}
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Discussion

The purpose of this review was to synthesize and appraise the effects on PrEP initiation and the acceptability and feasibility of PrEP SDMs designed to promote linkage to care among AGYW and men eligible for PrEP in SSA. Given the challenging interactions between AGYW and men and the health system, we reviewed evidence of PrEP initiation in a range of SDMs i.e., health facility-, mobile-, community- based or hybrid models, and we explored the perceptions, barriers, and facilitators of these models. This scoping review identified 27 primary studies and 10 conference abstracts.

Delivery of PrEP to AGYW included HF-B models which integrated PrEP into routine FP/MCH/SRH/ANC services, hybrid models which allowed AGYW to initiate PrEP either at community-based venues or private or public facilities and mobile models. Whereas integrated models provided at a public health facility offer a potential “one-stop” location for AGYW to initiate PrEP whilst accessing other services, the additional time spent on PrEP-related activities may deter AGYW from initiation. Roche et al found in a study on integrated PrEP-FP service delivery that youth-friendly clinics are “low-hanging fruit” for PrEP delivery. The youth friendly approach and clinic flow implemented at one of the clinics required less room-to-room movement thus making PrEP delivery to AGYW easier. The second clinic which offered PrEP like any other outpatient service, with clients receiving HIV testing services at HTS points, PrEP counselling and clinical review in consultation rooms, and prescription dispensing at the pharmacy was not favoured by AGYW who did not want to queue at each service point and discuss their sexual activity in crowded FP consultation rooms.⁶¹ Integrated delivery of PrEP provides an opportunity to respond to potential syndemics in AGYW who are eligible for PrEP; however, we found mixed results regarding the effectiveness of integrated models on PrEP initiation. Two studies in which PrEP was initiated in an FP or MCH clinic showed PrEP initiation of <50% with initiation being higher in women >24 years.^{31 32} A third multi-country study which integrated PrEP with SRHS at FP clinics showed 90% PrEP initiation.³⁰ These studies were primarily implementation studies without a comparator, and PrEP related activities were provided by a PrEP-dedicated nurse. This task-shifting strategy removed this additional service from the workload of already overburdened routine nurses; however, the feasibility of this approach requires further evaluation considering the human resources challenges in SSA. Integration of HIV services and other health services has shown to be a useful strategy to improve linkage to HIV care, ART initiation and viral suppression. The most common forms of integration were (i) HIV testing and counselling added to non-HIV services and (ii) non-HIV services added to antiretroviral therapy (ART). The most commonly integrated non-HIV services were maternal and child healthcare, tuberculosis testing and treatment, primary healthcare, family planning, and sexual and reproductive health services.⁶² Innovative adaptations are needed at public primary health facility level to overcome PrEP delivery challenges and barriers that are faced by users and staff. Irungu et al reported adaptations within integrated models such as fast tracking PrEP users to minimise

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3 waiting times and clinicians dispensing PrEP from clinical rooms which removed waiting times
4 at the pharmacy and mitigated any stigma associated with being seen at a pharmacy that
5 mainly dispenses ART.⁶³
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9 Adolescent-friendly clinics or adolescent-friendly sections within health facilities were also
10 shown to promote initiation of PrEP.^{29 30 39} However, a New York study of adolescents' PrEP
11 awareness showed that 86% of adolescents eligible for PrEP reported never being informed
12 about PrEP by their healthcare professionals.⁶⁴ Taggart et al. found that provider attitudes
13 and recommendations within a healthcare facility influence adolescents' willingness or
14 unwillingness to use PrEP.⁶⁵ Our results show that AGYW favour community-based youth-
15 friendly delivery modalities of PrEP such as DICEs or schools over delivery via public and
16 private health facilities. These findings concur with other studies which have shown that
17 factors that influence US women's decision-making about the use of PrEP include the ease of
18 accessing services and medication close to their homes.^{66 67} Moreover, women highlighted
19 the importance of community peers in influencing their decisions to initiate PrEP.⁶⁷
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26 We identified only one study among young, heterosexual men that explored the hypothetical
27 perceptions of PrEP initiation. Men reported that if PrEP was available, they would use it.
28 However, initiation was dependent on SDM and a HF-B model was not favoured due to
29 community stigma.²⁵ Heterosexual men are not classified as a key or vulnerable population in
30 the HIV prevention response, as such research that focuses on PrEP initiation or SDMs among
31 heterosexual men is limited. Increasing the engagement of men with health services requires
32 an understanding of the structural barriers that limit their access and requires targeted and
33 adaptive interventions to meet the needs of men. Differentiated service delivery models (for
34 example facility-based and/or community-based adherence clubs and quick pharmacy pick-
35 up) has been shown to improve uptake and retention of men in HIV treatment services.⁶⁸
36 Gender-transformative interventions such as "One Man Can", a rights-based gender equality
37 and health programme intervention, and Decentralized Medication Delivery (DMD) have also
38 shown success in reducing masculinity-related barriers to engaging in HIV prevention
39 services.⁶⁹ A recent study conducted in South Africa revealed that these differentiated service
40 delivery models have the potential to increase adherence to medication among men in
41 particular.⁷⁰ Other interventions/ models designed to help South African men initiate ART and
42 remain in care such as the MINA and Coach Mpilo campaigns, which provide men with
43 information and support that help them to get tested for HIV, to initiate and remain in care,
44 could also be used to promote PrEP initiation among men.^{71 72}
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52 In studies that targeted both women (including AGYW) and men, SDMs included a hybrid
53 approach (research site-community or community-health facility), community-based models
54 and those based at research sites. PrEP delivery to serodiscordant couples involved integrated
55 models such as delivery of PrEP and ART to serodiscordant couples allows both partners to
56 interact with the health system. In such models, PrEP is initiated and continued only until the
57 HIV infected partner achieves viral suppression which may be a cost-effective approach if viral
58 suppression is achieved timeously.⁴⁰ However, in a sub-Saharan setting where <65% of people
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3 living with HIV have suppressed viral load (VL) (<1000 copies/mL) and there are health
4 systems challenges with VL testing and turn-around-time, integrated delivery of PrEP and ART
5 may not be feasible.^{1 73} Our findings have shown that community-based models which involve
6 same-day HIV testing and PrEP initiation are favourable especially among men.⁴³
7 Furthermore, the delivery of PrEP through innovative community-based venues such as hair
8 salons which provided a comfortable and familiar environment yielded high interest in PrEP
9 initiation.⁴⁷ Many participants reported the convenience of pharmacies located close to public
10 transport routes, as many did not have access to cars or did not want to bear the cost of fuel
11 incurred travelling to the clinic.⁷⁴
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16 Both AGYW, men and serodiscordant couples have expressed that PrEP initiation is influenced
17 by the setting i.e., a friendly environment and by the attitude of healthcare workers i.e., non-
18 judgmental/non-stigmatizing.^{30 45} This suggests that the successful delivery of PrEP to AGYW
19 or men using HF-B models either through integrated or standalone approaches requires
20 healthcare workers to play an essential role.^{75 76} Structural barriers to PrEP initiation included:
21 the distance to travel to and time spent at health facilities. To address these barriers, there
22 is an increasing need for differentiated SDMs that provide alternative access options
23 especially considering that PrEP is a prevention intervention delivered to individuals who are
24 generally of good health and who may be disinclined to travel long distances and wait in long
25 queues to access PrEP.⁷⁷
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31 *Policy and programme recommendations and future research areas*

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33 Notably, literature on PrEP SDMs for AGYW and more especially heterosexual men is limited
34 thus calling for more research in these areas. In order to increase PrEP initiation, country
35 programme implementers need to understand which SDM/s work for AGYW or men and to
36 adapt these to best suit the unique needs of the users.⁷⁸ Opportunities exist for integrated
37 strategies of PrEP delivery at a health facility or mobile clinic. However, we need to
38 understand which integrated strategy (e.g., integration with ART, SRHS, or contraceptive
39 services) is most acceptable and scalable for AGYW and men. Further research is needed
40 among couples where one partner is on PrEP, to understand if the perception of risk changes
41 in the partner who is not on PrEP. We identified only one conference abstract that targeted
42 PrEP SDM among heterosexual men. This study was also limited as PrEP was not provided,
43 but hypothetical perceptions of PrEP were assessed. This dearth of published literature
44 highlights a major gap in the knowledge with considerably more research needed to
45 investigate SDMs among men. Training and retraining of healthcare workers on PrEP
46 guidelines is essential to equip them with the skills to ensure that PrEP is delivered in a friendly
47 and safe space by non-stigmatizing healthcare workers. To mitigate the time burden and
48 travel expenses incurred by AGYW and men, same-day initiation of PrEP to those eligible and
49 multi-months dispensing of refills should be considered.^{11 77 79}
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56 Furthermore, task-shifting among healthcare workers along the PrEP cascade will avoid
57 additional burden on the health system. Further studies are required to evaluate the
58 feasibility of PrEP-dedicated nurses. Differentiated SDMs are needed to take PrEP to where
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3 users live, socialise and work.¹¹ These models include home deliveries, pharmacies, DICEs,
4 salons, mobile clinics and tele-medicine-assisted models in both the public and private health
5 sectors. Mobile clinics near schools could be successful but need to be regular, reliable, and
6 sustainable. Furthermore, considering that eligibility for continuation on PrEP requires repeat
7 HIV testing, there is a need for interventions (e.g., HIV self-testing) to address this challenge
8 when PrEP is delivered at non- HF-B settings.
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11 12 **Strengths and limitations**

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14 The strengths of this review include the inclusion of multiple databases across disciplines and
15 broad inclusion criteria. We also used a comprehensive search strategy that followed the JBI
16 reviewer's manual and structured using PRISMA-ScR guidelines, and robust methods that
17 included double data screening, extraction, and review. Another strength is that we included
18 grey literature and unpublished reports which minimizes the chances of missing studies with
19 negative or null findings.
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24 Limitations include the exclusion of studies conducted in non-SSA and that were published in
25 non-English languages. In addition, due to a lag in adding and indexing articles in various
26 online databases, our review could fail to locate the most recent publications and research
27 on SDMs for PrEP initiation. Another limitation was that most of the included studies were
28 from three countries (Kenya, Uganda, and South Africa) hence the generalisability of the
29 results to SSA might be limited. Furthermore, there were limitations in the sources of
30 evidence as many of the studies evaluated the hypothetical perceptions of PrEP initiation and
31 some of the feasibility and acceptability is theoretical which may not translate to actual
32 realities. Also, the extraction focuses on synthesizing the setting where PrEP is offered, which
33 is only one component of the SDM and does not focus on other components such as the
34 strategies or individuals providing PrEP. Due to the dearth of literature on SDMs among AGYW
35 and men and considering that PrEP roll out in this population in many SSA countries has only
36 recently been maximised, we included research studies to understand the SDMs in this
37 setting. Although the recruitment criteria in a research setting may have resulted in a higher
38 initiation of PrEP, the lessons learnt from this setting could contribute to improving the roll
39 out of PrEP in AGYW and men. Critical appraisal of evidence from conference abstracts was
40 limited by the information provided in the abstract. As such, many items for conference
41 abstracts on the CASP tool were adjudicated as can't tell or unclear risk.
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50 **Conclusions**

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52 We conducted a scoping review on PrEP SDMs, summarising evidence on PrEP initiation using
53 existing models among AGYW and men and explored the users' perceptions, and barriers and
54 facilitators of these PrEP models. These models were mostly found to be hybrid approaches
55 (research site-health facility or community-health facility), community-based or based at a
56 research site. Community-based models at convenient locations were favoured by AGYW.
57 Integrated strategies delivered at friendly health facilities by non-stigmatising healthcare
58 providers was also a preferred PrEP delivery channel. The successful initiation of PrEP by
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3 AGYW and men will be dependent on the service setting where it is offered and cannot be
4 considered as a one size fits all approach. Care must be taken to find the delivery method best
5 suited to each sub-population. Future research should focus on what differentiated SDMs
6 work for AGYW and heterosexual men to identify which approach is most successful in
7 improving PrEP initiation and to understand their individual needs when using these models.
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18 19 20 **Disclaimer**

21 The findings and conclusions in this manuscript are those of the authors and do not
22 necessarily represent the official position of the US Centers for Disease Control and
23 Prevention.
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26 27 28 **Author Contributions:**

29 All authors contributed to conceptualising and designing the study. WC and TR conducted the
30 literature search. WC, TR, KJ, NJ, DG independently performed screening. WC, TR, CM, EN, ET,
31 MH, TMA, NJ, DG, BZ, WB and FM independently performed data extraction. EN developed
32 the data charting form on REDCap. WC and TR performed initial data synthesis and
33 interpretation and all authors refined it. WC and TR drafted the manuscript. All authors
34 contributed to writing and reviewing the manuscript.
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39 **Competing Interests:** None declared

40
41 **Patient consent for publication:** Not required

42
43 **Data availability statement:** All data relevant to the study are included in the article or
44 uploaded as supplementary information.
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46
47 **Ethics Approval:** The scoping review focuses on published research in the public domain
48 therefore no ethics approval is required.
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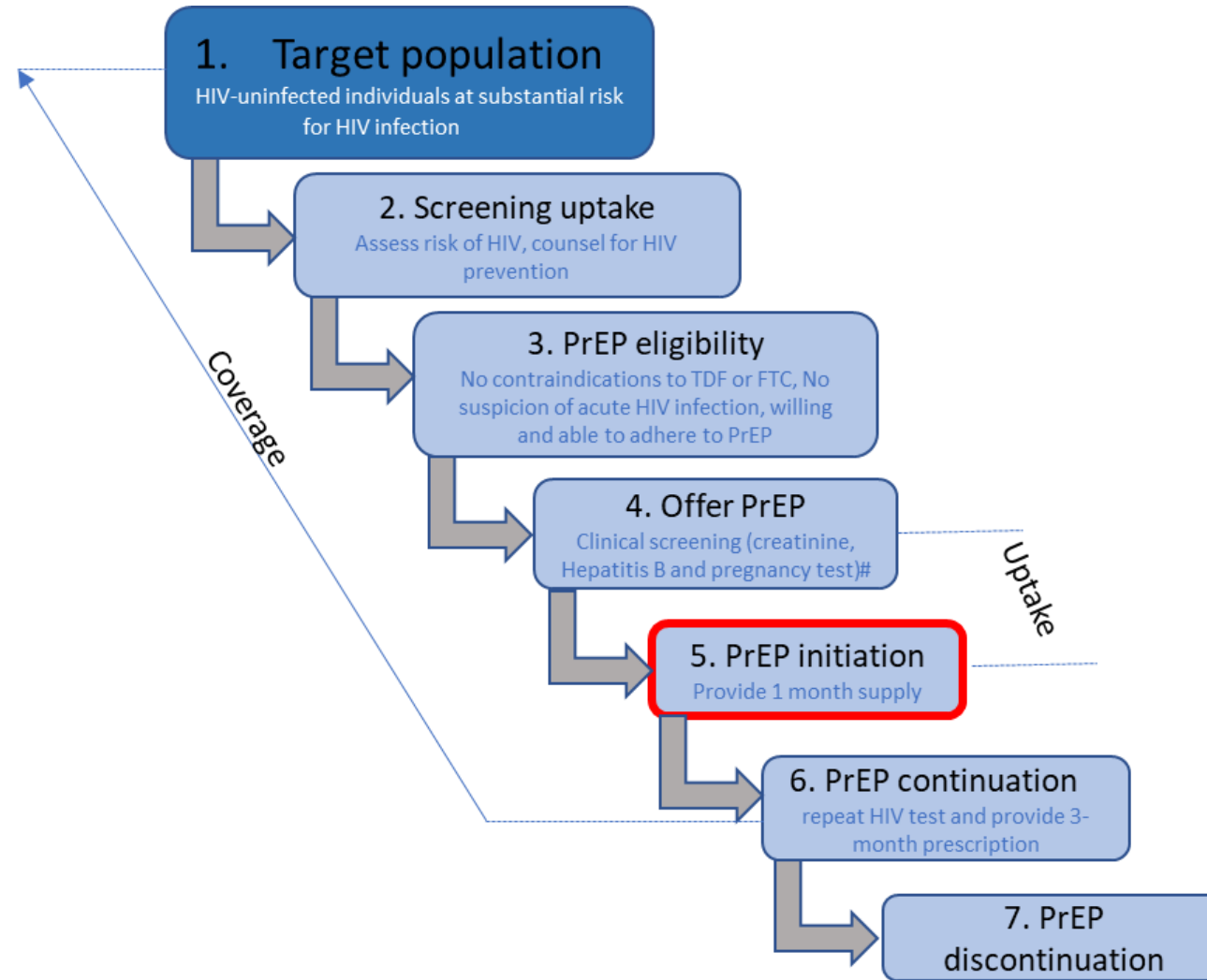
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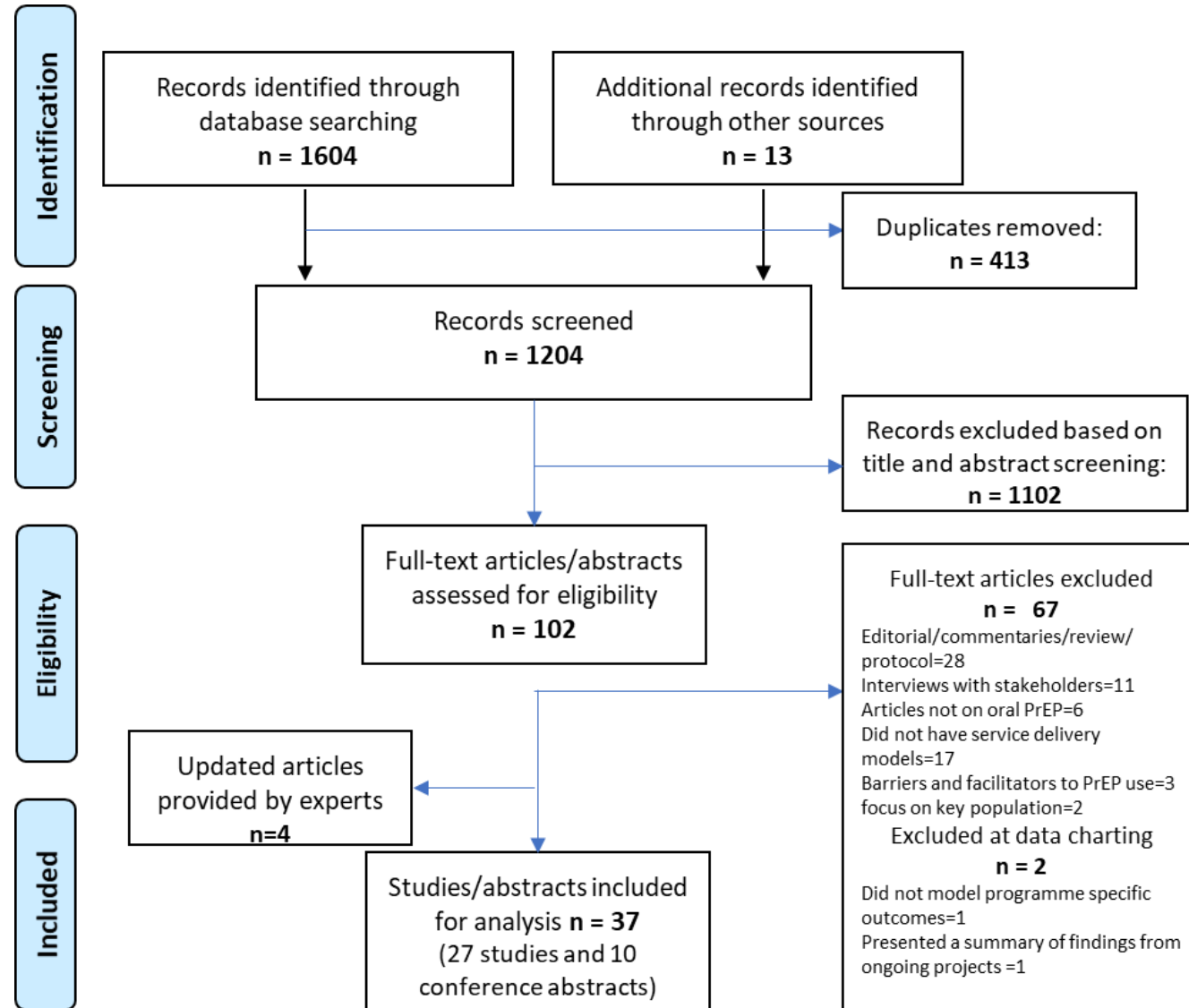
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SET		SEARCH TERMS
1	1 HIV	HIV-1
2		HIV
3		Hiv
4		Set 1- 3 will be combined with "or"
5	2 Pre-exposure Prophylaxis	PRE-EXPOSURE PROPHYLAXIS
6		Pre-Exposure Prophylaxis
7		PrEP
8		Set 5-7 will be combined with "or"
9		Set 4 and 8 will be combined with "and"
10	3 Linkage to care	service provision
11		service delivery
12		SDMs
13		IMPLEMENTATION SCIENCE
14		model
15		models of care
16		differentiated care
17		linkage
18		linkage to care
19		intervention
20		Set 10-19 will be combined with "or"
21		Set 4, 9 and 20 will be combined with "and"
22	4 Country	DEVELOPING COUNTRY
23		Sub-Saharan
24		AFRICA SOUTH OF THE SAHARA
25		AFRICA
26		<i>All sub-Saharan countries included as MeSH and text term combined with or</i>
27		Set 22-26 will be combined with "or"
28		Set 4, 9, 20 and 27 will be combined with "and"

Service Delivery Modality	Author (Year) and study setting	Publication type and objectives	Study population and Sample	Intervention description	Detailed Description of Findings
Studies among AGYW					
Health facility^a	Maseko et al. (2020) ³⁹ Malawi	Research article To understand knowledge of, interest in, concerns about, and delivery preferences for PrEP among AGYW enrolled in the Girl Power study.	Study population: Never been offered to use PrEP services (hypothetical opinions related to PrEP) Sample Sample size (total – N): 40 Gender distribution: Female: 100% Age distribution: 15-19yrs: 21; 20-24yrs: 19	Nature of Intervention: Four models of service-delivery were compared in four separate clinics: Model 1) standard of care (SoC), Model 2) Integrated youth-friendly health services; Model 3) Model 2 plus a small-group behavioural intervention on; and Model 4) Model 3 plus a cash transfer (\$5.50/month). An explanation of PrEP was provided to 40 participants prior to IDI Intervention components: HIV testing, syndromic management of STIs, family planning, and condom distribution. NB: PrEP was not provided in this study, nor was it available in government clinics at the time of the study.	<ul style="list-style-type: none"> • Interest in PrEP based on a belief that their HIV risk exposure was due to factors that were out of their control, including partners having concurrent relationships, challenges with condom negotiation/use, and rape. • Disinterest in PrEP included: perception of low risk because of abstinence or having a single partner, use of PrEP implying infidelity among married AGYW, taking pills daily implying HIV infection. • Interest in initiating PrEP depends upon: <ul style="list-style-type: none"> - ease of accessing PrEP (confidential), - packaging attributes (discrete, cartons, packets, or bottles that would give the appearance of medications for common ailments preferred - delivery context (available in locations frequented by youth such as schools or youth friendly spaces because of ease of access and comfort in the absence of adult patients and family members).

<p>Health facility^b</p>	<p>Mugwanya et al. (2019)³¹</p> <p>Kenya</p>	<p>Research article</p> <p>To demonstrate the feasibility of integrating PrEP delivery within routine family planning clinics to reach at-risk AGYW for PrEP in HIV high burden settings.</p>	<p>Study population: Offered to use PrEP services</p> <p>Sample <i>Sample size (total – N):</i> 1271 <i>Gender distribution:</i> Female: 100% <i>Age distribution:</i> Median: 25 (22-29) <20: 105 20-24: 522 25-29: 356 30-34: 172 ≥35: 116</p>	<p>Nature of Intervention: PrEP-dedicated nurse-led integrated delivery of PrEP in family planning clinics</p> <p>Intervention components: Newly hired nurses were trained on HIV risk assessment, counselling, and PrEP provision. These nurses performed only these duties at the FP clinic. Women attending FP clinics completed other services were then referred to the PrEP-dedicated nurse. This nurse counselled and assessed willingness to consider PrEP (guided by a national guidelines and HIV risk assessment screening tool). Interested and medically eligible women were provided same-day PrEP initiation.</p>	<ul style="list-style-type: none"> • Of 1,271 women screened, 22% initiated PrEP, and 41% returned for at least one refill. • PrEP uptake was independently associated with reported male-partner HIV status ($p < 0.001$) and marital status ($p = 0.04$). • More women >24 years (26%) initiated PrEP compared to young women <24 years (16%). • For women >24 years, the likelihood of initiating PrEP increased by about 3% for each additional year of a woman's age ($p < 0.001$). • FP clinics can be an effective platform to efficiently reach HIV at-risk women who may benefit from PrEP. • Integration of PrEP delivery in FP clinics, makes this a potential "one-stop" location for FP and PrEP. • Although FP visits are busy, efficient implementation strategies such as less frequent PrEP visits and expanding the pool of providers who might be able to screen and provide PrEP beyond the few clinicians and nurses (e.g., training and empowering HIV testing counsellors and community health workers or peer educators) can be built into existing routine services.
<p>Health facility^b</p>	<p>Pintye et al. (2018)³³</p> <p>Kenya</p>	<p>Research article</p> <p>To define approaches for integrating PrEP into routine</p>	<p>Study population: Offered to use PrEP services</p> <p>Sample</p>	<p>Nature of Intervention: Nurse-led teams worked with maternal and child health (MCH) staff at 16 public, faith-based, and</p>	<ul style="list-style-type: none"> • Clinics developed two approaches for integrating PrEP delivery within ANC/PNC: 1) co-delivery: ANC/PNC and

		antenatal and post-natal care (ANC/PNC) using PrIYA Program as a case study.	<p>Sample size (total – N): 16 Health facilities; 40 program-supported nurses</p> <p>Gender distribution: Female 100%</p> <p>Age distribution: not described</p>	<p>private facilities to determine optimal clinic flow for PrEP integration into antenatal (ANC) and postnatal (PNC) care. A program-dedicated nurse facilitated integration.</p> <p>Intervention components:</p> <p>All ANC/PNC clients received assessment for behavioural risk (completion of a questionnaire and willingness to consider PrEP, general informational counselling on PrEP depending on the client's awareness and interest in PrEP. Among clients who were willing to initiate PrEP, PrEP counselling also included information on how to use PrEP and adherence as well as medication dispensation.</p>	<p>PrEP services delivered by same MCH nurse or 2) sequential services: PrEP services after ANC/PNC by a PrEP-specialized nurse.</p> <ul style="list-style-type: none"> • 86 ANC/PNC visits were observed. • Clients who initiated PrEP took a median of 18 minutes (IQR 15-26) for PrEP-related activities (risk assessment, PrEP counselling, creatinine testing, dispensation, and documentation) in addition to other routine ANC/PNC activities. • For clients who declined PrEP, an additional 13 minutes (IQR 7-15) was spent on PrEP-related risk assessment and counselling. • PrEP-specific activities took <20 minutes per client, the moderate additional time burden for PrEP initiation in MCH would likely decline with community awareness and innovations such as group/peer counselling or expedited dispensing.
Health facility	Kinuthia et al. (2020) ³² Kenya	<p>Research article</p> <p>We implemented and evaluated a novel programme to provide PrEP in maternal and child health clinics in Kenya</p>	<p>Study population: Offered to use PrEP services</p> <p>Sample</p> <p>Sample size (total – N): 9376 women</p> <p>Gender distribution: Female:100%</p> <p>Age distribution: <24: 5033 Median age: 24 years (IQR: 21-28)</p>	<p>Nature of Intervention:</p> <p>Integration of PrEP into existing structures at 16 maternal and child health clinics (public, faith-based, and private sector) At each facility, they offered sensitisation sessions to introduce the programme, educate facility staff on PrEP, and seek advice on the best way to integrate PrEP delivery at the facility.</p>	<ul style="list-style-type: none"> • PrEP initiation: 2030 (21.7%) women-initiated PrEP: 79.3% women with partners living with HIV, 37.2% with partners of unknown HIV status, and 11.6% women with HIV-negative partners. • 999 (49.2%) women who initiated PrEP were younger than 24 years • Reasons for initiating PrEP: having a partner living with HIV

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				<p>Intervention components: Programme nurses approached all eligible women provided PrEP counselling as part of routine maternal and child health clinic processes. Risk was assessed using a using a risk assessment tool Women who did not know the HIV status of their partners were offered HIV self-testing kits, if they were willing to test with their partners at home. All women (regardless of risk factors) were informed that PrEP was available if they perceived they were at risk for HIV.</p>	<p>or of unknown HIV status and feeling at risk for acquiring HIV. Reasons for declining PrEP: need to consult partner and low perceived HIV risk Factors associated with initiation: being younger than 24 years, having a partner living with HIV or of unknown HIV status, gestational age less than 26 weeks among pregnant women, having experienced intimate partner violence in the previous 6 months, or sharing needles while engaging in injection drug use, diagnosed or treated for an STI, forced to have sex, and had recurrently used PEP.</p> <ul style="list-style-type: none"> • PrEP continuation: 38.7% of 2030 women returned for PrEP refill at least 1 month after initiation • Factors associated with continuation: women with HIV-positive partners. • Reasons for discontinuation: side effects, no longer perceiving HIV risk, and partner known to be HIV-negative. • PrEP refills: 21.7% of women who initiated PrEP at least 3 months before this evaluation returned for PrEP refill. Of these 242 (54.9%) were younger than 24 years and 199 (45.1%) were aged 24 years or older (p=0.05).
Health facility	Pintye et al. (2019) ²⁹ Kenya	Conference abstract To understand motivations for early PrEP discontinuation	Study population: Offered to use PrEP services Sample size (total – N):	Nature of Intervention: The PrIYA Program provides real world evidence on delivering PrEP to AGYW	<ul style="list-style-type: none"> • Interest in initiating PrEP was heavily influenced by one-on-one interactions with a close

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		among AGYW and Adolescents (PrIYA) Program	69 AGYW 69 in-depth interviews: 21 AGYW received, but never used PrEP • 24 discontinued PrEP within 1 month • 24 discontinued PrEP within 3 months Gender distribution: Females: 100% Age distribution: Age (years) 22 (20-23)	seeking routine ANC, PNC and family planning (FP) services within 16 MCH clinics in Kisumu County, Kenya Intervention components: N/A AGYW were identified by program nurses and purposively sampled based on 3 categories	friend, relative, or teacher/professor <ul style="list-style-type: none"> • Early PrEP discontinuation patterns were influenced by side effects (feared or experienced) and important life events AGYW frequently stopped PrEP after childbirth and found it challenging to remember to take PrEP during the complex transition to motherhood • AGYW reported that pre-initiation counselling focused on adherence; many were unaware that they could restart PrEP after stopping • Messaging on stopping/restarting PrEP tailored to life events common among AGYW, such as childbirth and periods away from partners, could promote appropriate PrEP use
Health facility^a	Hill et al (2020) ³⁸ Malawi	Research article To understand the level of interest in PrEP among AGYW at highest HIV risk, and the potential role of perceived risk in motivating PrEP interest.	Study population: Never been offered to use PrEP services (hypothetical opinions related to PrEP) Sample Sample size (total – N): 825 Gender distribution: Female: 100% Age distribution: Median: 20 [18 to 22] (range: 15 to 27)	Nature of Intervention: AGYW rated their potential interest in using PrEP after receiving this explanation: "PrEP is a medicine that can be used to prevent HIV for people who are HIV-negative. To be protected with PrEP, a pill is taken every day. These pills contain some of the same medicine used to treat people who already have HIV. PrEP is not currently available in Malawi." Intervention components: participants were enrolled and followed for one year.	<ul style="list-style-type: none"> • Epidemiologic risk scores were positively associated with PrEP interest, high numbers of AGYW both above and below the high-risk cut-off were very interested in PrEP (68% vs. 63%). • Perceived risk partially explained the relationship between HIV risk and PrEP interest; greater epidemiologic HIV risk was associated with high perceived risk, which was in turn associated with PrEP interest. • Many more high-risk AGYW were interested in PrEP (68%)

				<p>NB: PrEP was not provided in this study, nor was it available in government clinics at the time of the study.</p>	<p>than expressed a high level of perceived HIV risk (26%).</p> <ul style="list-style-type: none"> • High number of participants with risk scores below the high-risk cut-off who both expressed high perceived risk and interest in PrEP suggesting that demand for PrEP among AGYW may not be well aligned with epidemiologic risk
<p>Mobile clinic/health facility^c</p>	<p>Travill et al. (2018)³⁰</p> <p>Kenya and South Africa</p>	<p>Conference abstract</p> <p>To assess PrEP uptake and sexual behaviour in the POWER cohort.</p>	<p>Study population: Offered to use PrEP services</p> <p>Sample <i>Sample size (total – N):</i> 330 <i>Gender distribution:</i> Female: 100% <i>Age distribution:</i> Median age: 20.5 years (IQR:19-22)</p>	<p>Nature of Intervention: PrEP was integrated with reproductive health services at family planning clinics (Kisumu, Kenya), an adolescent and youth-friendly clinic (Johannesburg, South Africa [SA]) and a mobile van for reproductive health services for youth (Cape Town, SA)</p> <p>Intervention components: PrEP for AGYW</p>	<ul style="list-style-type: none"> • PrEP uptake at the initial visit was 90% across all sites. • Two-thirds (68%) did not know their partners' HIV status and only 4% were in a known sero-discordant relationship. • Main reasons for declining PrEP were fears of HIV stigma or partner reactions • AGYW had evidence of high HIV risk using a risk score, indicating that women initiating PrEP would benefit from it. • AGYW had high willingness to initiate PrEP when delivered in these youth-friendly settings.
<p>Hybrid (community-health facility)^c</p>	<p>Ong'wen et al. (2018)²⁸</p> <p>Kenya</p>	<p>Conference abstract</p> <p>To know more about adolescent girls accessing routine PrEP services in the context of national scale-up programs.</p>	<p>Study population: Offered to use PrEP services</p> <p>Sample <i>Sample size (total – N):</i> 1851 <i>Gender distribution:</i> Females: 100% <i>Age distribution:</i> 15-19 years</p>	<p>Nature of Intervention: PrEP integration through drop-in centres (DICEs), public and private clinics</p> <p>Intervention components: The adolescents received either static or outreach services from 93 Jilinde supported clinics</p>	<ul style="list-style-type: none"> • Among 28,268 clients initiating PrEP, 1851 (6.5%) were adolescent girls • DICEs, clinics designed primarily for sex workers, were the preferred PrEP outlet for adolescent girls, with 66% accessing services in DICEs, 25% accessed PrEP services in public clinics and 9% in private clinics. • Entry to PrEP was through peer educators and networks (50%);

					community outreaches (20%); and within health facilities (30%)
					<ul style="list-style-type: none"> • Efforts to make PrEP accessible to AGYW at risk of HIV acquisition should include restructuring the service delivery model
10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35	<p>Mobile clinic^c</p> <p>Rousseau et al. (2019)²⁹</p> <p>South Africa</p>	<p>Conference abstract</p> <p>Hypothesized that contraceptive use was associated with PrEP uptake and continuation in young women accessing sexual and reproductive health services</p>	<p>Study population: Offered to use PrEP services</p> <p>Sample <i>Sample size (total – N):</i> 1096 <i>Gender distribution:</i> Female: 100% <i>Age distribution:</i> 16-25</p>	<p>Nature of Intervention: Contraceptive use associated with PrEP uptake and continuation in AGYW accessing sexual and reproductive health services (SRHS) from a mobile clinic</p> <p>Intervention components: Sexual reproductive health service including HIV testing, contraception (oral, injectable and implant), and PrEP</p>	<ul style="list-style-type: none"> • Among 1096 AGYW who accessed SRHS 31% initiated PrEP on the same day. • AGYW who were using contraception were significantly more likely to initiate PrEP on the same day compared to those who declined PrEP (76% vs 66% on contraception at that visit; p=0.001). • PrEP initiation was also significantly associated with contraception initiation; contraception was initiated by 44% of AGYW on the same day as PrEP initiation compared to 30% contraception starts in AGYW who declined PrEP (p=0.003). • AGYW's contraception use facilitated PrEP initiation and continuation, PrEP initiation also encouraged young women to initiate contraception use supporting the integration of SRHS with the provision of PrEP for AGYW.
36 37 38 39 40 41 42 43 44 45 46 47	<p>Research site</p> <p>Delany-Moretlwe et al. (2018)³⁶</p> <p>South Africa & Tanzania</p>	<p>Conference abstract</p> <p>To evaluate whether empowerment clubs increase PrEP uptake and continuation among AGYW.</p>	<p>Study population: Offered to use PrEP services</p> <p>Sample <i>Sample size (total – N):</i> <i>Gender distribution:</i> Female:100%</p>	<p>Nature of Intervention: Participants were randomised to standard of care (SoC), which included comprehensive sexual and reproductive health care, with counselling and SMS</p>	<ul style="list-style-type: none"> • 431 AGYW enrolled and 213 randomised to clubs • 97% initiated PrEP • PrEP continuation did not vary significantly by study arm (p-value =0.31)

			Age distribution: Not mentioned	reminders for PrEP users, or to empowerment clubs plus SOC. Intervention components: Facilitators-led small group sessions and clinic follow-up visits for sexually active AGYW on PrEP	<ul style="list-style-type: none"> PrEP continuation was 73% at month 1, 61% at month 3 and 34% at month 6. While PrEP uptake was high in this at-risk population, use diminished with time. Empowerment club participation was low and did not enhance PrEP continuation, contrary to experiences in the HIV treatment field.
Research Site	Donnell et al. (2021) ³⁷ South Africa	Research article To assess the effect of on-site access to PrEP on HIV incidence.	Study population: Offered to use PrEP services Sample Sample size (total – N): 2121 Gender distribution: Female:100% Age distribution: 16-35 years; median age: 23 years (IQR 20-27)	Nature of Intervention: On-site PrEP access at nine trial sites provided by research staff Intervention components: Research nurse provided PrEP	<ul style="list-style-type: none"> After on-site PrEP access began 543 (26%) out of 2124 reported PrEP use. HIV incidence was 2.16% after on-site PrEP access, compared with 4.65% before PrEP access (p=0.0085). Future studies of HIV prevention should incorporate PrEP as part of the standard of prevention
Hybrid (community-Health facility)	Were et al (2020) ³⁵ Kenya	Research article To describe the programmatic application of an oral PrEP cascade; to quantify progression across each step of the cascade for female sex workers (FSW), MSM and AGYW and, to identify missed opportunities.	Study population: Offered to use PrEP services Sample Sample size (total – N): 299,798 Gender distribution: FSW: 211,927, MSM: 47,533 MSM and AGYW: 40,338 Age distribution: AGYW: 15-24; FSW >15 years; MSM:>15 years	Nature of Intervention: Scaling up oral PrEP through integration into routine health services in drop-in centres (DICES), public and private health facilities Intervention components: Individuals enter the PrEP pathway through community mobilization. Individuals who are interested in PrEP are referred to facilities providing PrEP, where they undergo HIV testing services. Clients who screen positive for substantial behavioural risk, or who request PrEP, are referred to an	Quantitative: <ul style="list-style-type: none"> Among PrEP-eligible individuals, 2,900 (11%) AGYW, were initiated on PrEP. Of these clients, whereas 55% of AGYW were between 20 and 24 years. Majority (81%) of clients-initiated PrEP through DICES, whereas 14% and 5% were initiated through public and private facilities respectively. PrEP cascade for AGYW aged 15-19 years: HIV- negative (99%), screened (22%), eligible (36%), initiation (95%), month 1 follow-up

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			<p>onsite clinician who conducts a clinical assessment and provides PrEP to clients who are eligible and opt-in. Clients are followed-up visit at the same facility one month following initiation and monthly thereafter.</p>	<p>(31%), month 3 follow up (5%)</p> <ul style="list-style-type: none"> • PrEP cascade for AGYW aged 20-24 years: HIV- negative (98%), screened (23%), eligible (34%), initiation (91%), month 1 follow-up (32%), month 3 follow up (5%) • AGYW had higher missed opportunities for screening (78%). Among those screened, a substantially higher proportion of AGYW (65%) were ineligible for PrEP. • Missed opportunities for PrEP initiation was 8% among AGYW. • Majority of AGYW did not persist on PrEP use at month-1 (68%) and month-3 (94%) follow-ups. <p>Qualitative</p> <ul style="list-style-type: none"> • Eligibility for PrEP: Poor rapport between AGYW and providers inhibits disclosure of risk behaviours. Peer mobilization and referral of low-risk individuals coupled with inadequate client education on PrEP. • Initiation of PrEP: Myths and misconceptions about PrEP and low risk perception among FSW, MSM and AGYW. Co-location of both PrEP and HIV services in comprehensive care centres (HIV clinics) resulted in PrEP clients feeling stigmatized as HIV positive.
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					Stigma-related discouragement from peers, family and friends for eligible users. Providers reluctance to prescribe PrEP associated with reluctance to increase provider workload; provider belief that client will not adhere to PrEP. Insensitive referral and access pathways in public and private health facilities.
Studies among Men					
Not specified	Bell et al. (2019) ²⁵ South Africa	Conference abstract To understand perceptions of PrEP, and barriers and enablers of uptake among young South African men.	Study population: Never been offered to use PrEP services (hypothetical opinions related to PrEP) Sample <i>Sample size (total – N):</i> 2077 (Quantitative: 2019; Qualitative: 58) Gender distribution: Male: 100% Age distribution: 20-34	Nature of Intervention: Perceptions of PrEP use and barriers and enablers of uptake. 58 IDIs Intervention components: N/A	<ul style="list-style-type: none"> • Enablers to PrEP use: <ul style="list-style-type: none"> - Maintain an HIV-negative status - Avoid conflict and turmoil that HIV diagnosis would bring - High degree of enthusiasm towards the concept • Barriers to PrEP use: <ul style="list-style-type: none"> - Practical: remembering to take the pill daily, side effects and access to clinics. - Knowledge: Had basic information, confused PrEP with PEP - Psychological: perceived as "only for women" and health seeking behaviour is not the norm for men. - Social: Being seen at clinics by community members, as people will assume that they are HIV positive. - Interpersonal: Keep PrEP use a secret from their partners, friends and family.
Studies among AGYW and Men					

<p>1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32</p> <p>Hybrid (research site-health facility)^e</p>	<p>Heffron et al. (2018)⁵²</p> <p>Kenya and Uganda</p>	<p>Research article</p> <p>To explore fertility intentions, pregnancy, and evaluated the use of PrEP and ART as periconception HIV risk reduction strategies.</p>	<p>Study population: Offered to use PrEP services</p> <p>Sample <i>Sample size (total – N):</i> 1013 <i>Gender distribution:</i> HIV-infected females: 455; HIV-uninfected males: 224; HIV infected males: 110; HIV-uninfected females: 224 <i>Age distribution:</i> HIV-infected females: 26 (22-30); HIV-uninfected males: 30 (26-37); HIV-uninfected females: 29 (24-35); HIV-infected males: 35 (30-42)</p>	<p>Nature of Intervention: The PrEP delivery model integrated PrEP into HIV treatment services. PrEP discontinuation was encouraged once the HIV-infected partner had used ART for at least 6 months (time to achieve HIV viral suppression).</p> <p>Intervention components: Couples-based HIV prevention counselling; safer conception counselling or contraceptives; counselling and HIV testing for HIV-uninfected partner; PrEP initiation/prescription and adherence counselling; referral of HIV infected partner for ART</p>	<ul style="list-style-type: none"> • Uptake and adherence to integrated PrEP and ART strategy was high with an estimated 96% reduction in HIV incidence. • During the 6 months preceding pregnancy, 82.9% of couples used PrEP or ART and there were no HIV seroconversions, 14.5% used some ART and/or PrEP and 2.6% used neither PrEP nor ART. • Among the 81 couples who were using ART only (61 couples with HIV-infected women and 20 with HIV-infected men), 91.2% of the HIV-uninfected partners had discontinued PrEP due to sustained (i.e., [6 months] ART use by their HIV infected partner. • Integrated PrEP and ART was readily used by HIV serodiscordant couples. • Widespread scale-up of safer conception counselling and services is warranted to respond to strong desires for pregnancy among HIV-affected men and women.
<p>33 34 35 36 37 38 39 40 41 42 43 44 45 46 47</p> <p>Hybrid (research site-health facility)^e</p>	<p>Ngure et al. (2016)⁴⁵</p> <p>Kenya</p>	<p>Research article</p> <p>To gather insights into couples' decision-making, motivations for PrEP uptake, and experiences soon after PrEP initiation.</p>	<p>Study population: Offered to use PrEP services</p> <p>Sample <i>Sample size (total – N):</i> 40 <i>Gender distribution:</i> Female: 20; Male:20 <i>Age distribution:</i> Females: 29.1 (20-43), Males: 36.6 (27-57)</p>	<p>Nature of Intervention: The PrEP delivery model integrated PrEP into HIV treatment services. PrEP discontinuation was encouraged once the HIV-infected partner had used ART for at least 6 months (time to achieve HIV viral suppression).</p>	<ul style="list-style-type: none"> • PrEP offered couples an additional strategy to reduce the risk of HIV transmission, meet their fertility desires, and cope with HIV serodiscordance. • Remaining HIV-negative at follow-up visits reinforced couples' decisions and

				<i>Intervention components:</i> At the time of interview: time since initiating PrEP was 6.3 months and time since initiating ART was 5.6 months	<p>motivated continued adherence to PrEP. Daily PrEP use supported the HIV-infected partners adherence to ART.</p> <ul style="list-style-type: none"> • A positive clinical encounter (provider's advice and client-friendly services) motivated initiation and continuation of PrEP
Hybrid (community-health facility)^d	Koss et al. (2018) ⁴¹ Kenya and Uganda	Research article To report on "early adopters" of PrEP in the Sustainable East Africa Research in Community Health (SEARCH) study in rural Uganda and Kenya. intervention.	<p>Study population: Offered to use PrEP services</p> <p>Sample</p> <p><i>Population:</i> AGYW Men</p> <p><i>Sample size (total – N):</i> 4064</p> <p><i>Gender distribution:</i> 1934 females 2130 males 48% females 52% males</p> <p><i>Age distribution:</i></p>	<p><i>Nature of Intervention:</i> PrEP education and discussions occurred on arrival at the health campaign, with HIV counsellors and clinicians. During home-based testing, 1 staff member conducted HIV testing and counselling and provided info about PrEP.</p> <p><i>Intervention components:</i> 1-month community mobilization and sensitization activities on PrEP. PrEP risk score or was administered. Hybrid HIV and multi-disease testing was conducted (health campaigns & home-based) with counselling and health education discussions on PrEP.</p>	<ul style="list-style-type: none"> • Of 21 212 HIV-uninfected adults, 4064 were identified for PrEP (2991 by empiric risk score, 1073 by self-identified risk). • 739 individuals started PrEP within 30 days; 77% on the same day. • Among adults identified by risk score, predictors of early adoption included male sex (adjusted odds ratio 1.53; 95% confidence interval, 1.09-2.15), polygamy (1.92; 1.27-2.90), serodiscordant spouse (3.89; 1.18-12.76), self-perceived HIV risk (1.66; 1.28-2.14), and testing at health campaign versus home (5.24; 3.33-8.26). • Among individuals who self-identified for PrEP, predictors of early adoption included older age (2.30; 1.29-4.08) and serodiscordance (2.61; 1.01-6.76).
Hybrid (community-	Koss et al. (2020) ⁴³	Research article To assess PrEP uptake and engagement after population-	<p>Study population: Offered to use PrEP services</p> <p>Sample</p>	<i>Nature of Intervention:</i> Population-level HIV and multi-disease testing using a hybrid mobile testing approach	<ul style="list-style-type: none"> • In 12935 (10% serodifferent partnership, 54% risk score, 36% self-identified risk) people

<p>health facility)^d</p>	<p>Kenya and Uganda</p>	<p>level HIV testing and universal PrEP access to characterise gaps in the PrEP cascade</p>	<p>Sample size (total – N): 12935 (HIV-negative with elevated risk) Gender distribution: Female: 6459; Male: 6476 Age distribution: 15-24: 4800; 25-34: 4712; 35-44: 1927; 45-54: 991; ≥55: 505</p>	<p>at community health fairs, home-based testing or facilities. PrEP initiation at health fairs or at local clinic. Intervention components: <i>Community:</i> community sensitisation, HIV testing, PrEP counselling to HIV- negative people at elevated risk (serodifferent partnership, risk score, or self-identified risk); on-site PrEP start at health fairs or same-day PrEP initiation at local clinics. <i>Home:</i> home-based testing and PrEP counselling, offer of PrEP through local clinics. <i>Local clinic:</i> Patients with HIV were asked to bring their HIV-negative or partners with unknown HIV status to the clinic for HIV testing and the offer of PrEP initiation. <i>Follow up:</i> visits included supportive delivery system with options for visits at clinic, home, or community locations. Follow up visits included: HCT, PrEP refill blood tests and adherence measurements</p>	<p>at elevated risk, 27% initiated PrEP.</p> <ul style="list-style-type: none"> • 82% initiated PrEP on the same day as HIV testing, 50% of whom were men • 19% of AGYW (15-24 years) initiated PrEP • PrEP uptake was lower among individuals aged 15-24 years and mobile individuals. • At week 4, 64% were engaged in the programme, 49% received medication refills, and 40% self-reported adherence. • At week 72, 56% were engaged, 33% received a refill, and 27% self-reported adherence. • Inclusive risk assessment (combining serodifferent partnership, an empirical risk score, and self-identification of HIV risk) was feasible and identified individuals who could benefit from PrEP. • The biggest gap in the PrEP cascade was PrEP uptake, particularly for young and mobile individuals.
<p>Hybrid (community-health facility)^d</p>	<p>Mayer et al. (2019)⁴² Uganda</p>	<p>Research article To estimate the association between distance to clinic and other transportation-related barriers on PrEP uptake and initial clinic visit</p>	<p>Study population: Offered to use PrEP services Sample Sample size (total – N): 701 Gender distribution: Female: 300; Male: 401 Age distribution: 15-24: 339; 25-34: 242;</p>	<p>Nature of Intervention: PrEP was given using a hybrid model and initiation was dependent on participant choice. PrEP could be initiated same day on-site at community health fairs or at local clinic). For those tested at home PrEP was offered within one to six months following the</p>	<ul style="list-style-type: none"> • Of the 701 PrEP-eligible participants, 39% started PrEP within four weeks; of these, 17% were retained at four weeks. • Participants with a distance to clinic of ≥2 km were less likely to start PrEP (p = 0.012) and

			<p>35-44:77; 45-54: 991; ≥45: 43</p>	<p>community campaign through local clinics. Intervention components: Meetings with community stakeholders to sensitise them on PrEP, at community health campaigns (CHCs), eligible HIV-negative participants at elevated risk (serodifferent partnership, risk score, or self-identified risk) were directed to a PrEP education station where they were informed about how PrEP works, interested participants were offered referral to a linkage station to make an appointment at clinic for PrEP enrolment or same-day PrEP start or a clinic appointment at a later date.</p>	<p>less likely to be retained on PrEP once initiated ($p = 0.024$)</p> <ul style="list-style-type: none"> • Eligible participants (from home-based testing) who did not have the option of same-day PrEP initiation were also less likely to initiate PrEP ($p < 0.001$). • Barriers to PrEP use: daily use of PrEP, "low/no risk of getting HIV, transportation-related barriers (clinic is too far away and travel away from home).
<p>Hybrid (community-health facility) ^d</p>	<p>Camlin et al. (2020)⁴⁴ Kenya and Uganda</p>	<p>Research article To explore understandings of PrEP, elucidate factors influential of demand, decisions around PrEP uptake or non-initiation, and adherence and discontinuation in population subgroups at elevated HIV risk.</p>	<p>Study population: Offered to use PrEP services Sample Sample size (total – N): 111 Gender distribution: Females: 65; Males: 46 Age distribution: 15-35, median age: 24 (range 17-35)</p>	<p>Nature of Intervention: Same day PrEP initiation on-site at community health campaigns or at health facilities. 8 FGDs (4 male, 4 female groups) each with 8-12 participants; 13 IDIs with PrEP initiators and 10 IDIs with PrEP decliners Intervention components: As per SEARCH study: Same day initiation of PrEP on-site at community health campaigns or health facilities. Transport to clinics for the PrEP initiation visit. Follow-up visits which occurred at local health facilities, participants' homes, or other community-based</p>	<ul style="list-style-type: none"> • Gendered motivations for PrEP: young men viewed PrEP as a means to safely pursue multiple partners, while young women saw PrEP as a means to control risks in terms of engagement in transactional sex and difficulty in negotiating condom use and partner testing. • Uptake was hindered by HIV/ART-related stigma (colour of pill same as ART, accessing PrEP at the same facility where HIV care was provided), the need for partners permission, distance to facilities, mixed messaging on the dosing of PrEP, taking daily medications, living with

				locations of the participant's choice.	<p>parents or were attending school, moral prohibitions against sex among young people, desire for “proof” of efficacy by peers</p> <ul style="list-style-type: none"> • Uptake was motivated by high perceived HIV risk, and beliefs that PrEP use supported life goals (completing schooling or having a family). • Discontinuation of PrEP was due to dissolution of partnerships/changing risk, unsupportive partners/peers, or early side effects/pill burden.
<p>Hybrid (community-health facility)^d</p>	<p>Koss et al. (2017)²⁶</p> <p>Kenya and Uganda</p>	<p>Conference abstract</p> <p>To evaluate barriers to the uptake of open-label PrEP offered in a population-based context in high HIV prevalence settings.</p>	<p>Study population: Offered to use PrEP services (nested in SEARCH Trial)</p> <p>Sample</p> <p>Population: Men. Women and youth</p> <p>Sample size (total – N): 63 Community members: 40% men; 35% women; 25% youth 42 Clients who did not initiate PrEP: 38% women; 45% at risk for HIV by empiric score</p> <p>Gender distribution: 16-53 years, median age of 28 years</p> <p>Age distribution: 40% men, 35% women, 25% youth</p>	<p>Nature of Intervention: This is a cross sectional study based on SEARCH trial</p> <p>Intervention components: n/a</p> <p>Intervention delivery setting: n/a</p>	<ul style="list-style-type: none"> - In communities that were offered targeted PrEP in this population-based study, multi-level barriers to the uptake of PrEP were identified. - In addition to barriers identified in prior studies of targeted populations, such as aspects of pill-taking, concerns about effectiveness, and partner and household---level influence, concerns about access to PrEP via health facilities or at school, opportunity costs, mobility, and misconceptions about PrEP as barriers to uptake in SEARCH communities. • Strategies are needed to address these barriers, such as community sensitization, expanded provision of information on PrEP, and community---based delivery mechanisms to facilitate access to PrEP.

<p>1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28</p> <p>Hybrid (community-health facility)</p>	<p>Gombe et al. (2020)⁴⁶ Zimbabwe</p>	<p>Research article To understand the factors that motivate clients to accept, decline, continue, or discontinue PrEP.</p>	<p>Study population: Offered to use PrEP services Sample <i>Sample size (total – N):</i> 60 <i>Gender distribution:</i> Female: 46; Male: 14 <i>Age distribution:</i> 16-25: 20%; 26-40: 60%; >41: 20%</p>	<p>Nature of Intervention: PrEP was integrated at two family planning clinics. 54 IDIs with PrEP acceptors and 6 IDIs with PrEP decliners Intervention components: HIV testing; screening for PrEP eligibility according to a tool; same day initiation of PrEP (one-month supply); follow-up visit at month 1 (three-month supply)</p>	<ul style="list-style-type: none"> • Motivators to accept PrEP: High HIV risk perception, preference for PrEP over other HIV prevention methods, perceived severity of living with HIV, confidence in PrEP • Barriers to accepting PrEP: fear of pill burden or impact of pills, wanting partners consent or fearing partner reaction to PrEP, feeling satisfied with current method of HIV prevention • Motivators to continue PrEP: focus on original motivation, establishing daily pill routine, accessible PrEP pill storage, planning ahead before travelling out of town, partner or facility support - Barriers to continuing PrEP: being unaccustomed to taking pills, religious issues, travel out of town, clinic schedule/hours, lack of transport funds, misunderstanding dosing guidance, side effects
<p>29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47</p> <p>Health facility</p>	<p>Sack et al (2020)⁵⁵ Mozambique</p>	<p>Research article To explore the perspectives, attitudes, and experiences of HIV serodiscordant partners taking PrEP and develop a messaging campaign to improve PrEP uptake in rural Mozambique to reduce HIV transmission among serodiscordant partners.</p>	<p>Study population: Offered to use PrEP services Sample <i>Sample size (total – N):</i> 20 <i>Gender distribution:</i> Female: 11; Male: 9 <i>Age distribution:</i> Median age 35, interquartile range 26.5-37.5). Female: median age 32, interquartile range 25.5-36; male: median age 36, interquartile range 31-38.</p>	<p>Nature of Intervention: Stories will be presented to discordant couples to try to improve PrEP uptake and reduce incident HIV infections. Intervention components: Three oral stories designed to educate, empower, and normalize PrEP use.</p>	<ul style="list-style-type: none"> • Individual factors influencing PrEP uptake and adherence: love for one's partner, knowledge about PrEP and the belief it is effective, fear of HIV and PrEP stigma • Interpersonal factors affecting PrEP uptake: desire to protect family, partner support and relationship strength, Overcoming the fear of stigma

					to seek support from family and friends
Community	Bassett et al. (2018) ⁴⁸ South Africa	Research article To assess the acceptability and feasibility of offering family planning and HIV prevention services at salons.	Study population: Never been offered to use PrEP services (hypothetical opinions related to PrEP) Sample Population: 17 hair salons, 92 stylists, 326 clients Sample size (total – N): Salons (N = 17), Owners (N = 17), Stylists (N = 92), Female clients (N = 326) Gender distribution: 100% of salon clients were female 82% of stylists were female 65% of owners were female Age distribution: Median age (IQR): Salon clients: 28 (IQR 24 to 33); Stylists: 29 (26-32) Owners: 36 (33-43)	Nature of Intervention: n/a Intervention components: n/a Intervention delivery setting: n/a	<ul style="list-style-type: none"> Overall, most owners, stylists, and clients were willing to receive contraception and PrEP from a nurse in hair salons in and around Umlazi Township. Frequent client visits and willingness of stylists to offer health education suggest that a stylist initiated, nurse-supported health intervention could be feasible in the salon setting. Hair salons represent a promising venue for reaching young women in sub-Saharan Africa at risk of unintended pregnancy and HIV infection.
Community	Bassett et al. (2019) ⁴⁷ South Africa	Research article To assess the acceptability of nurse-offered contraceptive and PrEP services at hair salons in Durban, South Africa.	Study population: Never been offered to use PrEP services (hypothetical opinions related to PrEP) Sample Population: Clients of hair salons-Females, mean age 27 years, hair salon owners, hair stylists Sample size (total – N): Clients=42 (all female) Stylists=43 (40 female; 3 male) Salon owners=10 (8 female; 2 male) Gender distribution: Clients: 42 Females Stylists: 40 Females; 3 Males Owners: 8 Females; 2 Males Age distribution: Clients: M=27.1; SD=6.3 Stylists: M-29.6; SD=5.1 Owners: M=40.3; SD; 7.6	Nature of Intervention: n/a Intervention components: n/a Intervention delivery setting: n/a	<ul style="list-style-type: none"> Participants felt that incentives would be beneficial to program enrolment, if not necessary, to garner interest among clients. One client noted that incentives have become an expected part of research Overall, participants liked the idea of receiving personal SMS messages and having WhatsApp groups as adherence supports. Clients preferred SMS messages for direct adherence motivation because they are more private. One client felt that an SMS could also serve as an automated daily reminder for women on PrEP to take their

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					<p>medication. A few participants also noted that SMS would be more accessible than WhatsApp given data constraints.</p> <ul style="list-style-type: none"> • Overall, participants were enthusiastic about the program. Convenience and a conducive environment were noted as facilitators to receiving health services in the hair salon; attention will have to be directed to establishing privacy and program legitimacy. • Hair salons represent an innovative venue for reaching young women at high-risk for unintended pregnancy and HIV infection.
Community	Lubwama et al. (2019) ⁴⁹ Uganda	Conference abstract A review of PrEP data from PEPFAR Data for Transparency Impact Monitoring (DATIM) for July 2017 to June 2018	<p>Study population: Offered to use PrEP services</p> <p>Sample Population: Key populations including sex workers (SW), men who have sex with men (MSM), transgender persons (TG) and other high-risk groups (fisher folk [FF], discordant couples [DC], truckers, adolescent girls and young women [AGYW] and people who inject drugs).</p> <p>Sample size (total – N): Initiated PrEP (6 sites) 3,846 PrEP clients (1 community): 1538</p> <p>Gender distribution: Not mentioned</p> <p>Age distribution: Not mentioned</p>	<p>Intervention components: Drop-in centres (DINCs), Community based outreach centres</p>	<ul style="list-style-type: none"> • 3,846 individuals-initiated PrEP; 2,568 (67.2%) SW, 327 (8.5%) MSM, 15 (0.4%) TG, and 918 (23.8%) other high-risk groups • One community had 1538 PrEP clients: 58.1% SW, 25.4% FF, 7.4% DC and 0.5% MSM. • Return rates for PrEP were higher among DC (3 months:56.9%, 6 months:46.8%) and low among SW (3 months 37.5%, 6 months 26.3%) and FF (3months 16.4%, 6months 14.2%). • The majority (69.2%, 1064/1538) were reached through outreach models versus fixed public health facilities • More SW than other KP and high-risk groups were reached with PrEP. Retention at 3 and 6

					<p>months was low for sex workers and fisherfolk, somewhat higher for discordant couples.</p> <ul style="list-style-type: none"> • Outreach approaches should be scaled up to reach more KP clients with PrEP. Retention strategies should be strengthened, especially for sex workers and fisherfolk, who may be highly mobile.
Community	Morton et al (2020) ⁵³ South Africa	<p>Research article</p> <p>To understand how to effectively create awareness, stimulate interest, and increase uptake of PrEP.</p>	<p>Study population: Never been offered to use PrEP services (hypothetical opinions related to PrEP)</p> <p>Sample Sample size (total – N): 385 Quantitative: 320 Qualitative: 28 key stakeholders; 11 PrEP-naïve young, 10 PrEP-experienced women, five older women living with HIV, four men, seven key informants</p> <p>Gender distribution: Female 100% in household surveys</p> <p>Age distribution: Quantitative: 20 (18, 23) Qualitative: PrEP-naïve young women (aged 16-25), PrEP-experienced women (aged 16-29), older women living with HIV (aged 26-32), men (aged 25-35)</p>	<p>Nature of Intervention: Young women were shown a 90-second PrEP demand creation video and two informational brochures and then asked to self-administer a short survey that included questions on demographics, sexual relationships, risk taking, HIV risk perception, PrEP interest and knowledge, and their opinions about the video..</p> <p>Intervention components: Research staff visited houses up to three times, requesting to speak with the young woman household resident. Young women who agreed to participate were shown the video and then asked to self-administer a short survey.</p>	<p>Quantitative</p> <ul style="list-style-type: none"> • Most reported interest in learning more about PrEP (67.7% 'definitely interested' and 9.4% 'somewhat interested') and taking PrEP (56.4% 'definitely interested' and 12.5% 'somewhat interested'). • Factors significantly associated with interest in taking PrEP were having a primary partner with whom they regularly have sex (80.0% vs. 65.2% without a primary partner; adjusted odds ratio (AOR)=3.1, 95% CI: 1.3, 7.0) and being in a sexual partnership for <6 months (86.8% vs. 68.5% for >12 months; AOR=3.0, 95% CI: 1.2, 7.3).
Research site	Heffron et al. (2018) ⁴⁰ East Africa	<p>Research article</p> <p>To present estimates of effectiveness and patterns of PrEP use within a two-year demonstration project of PrEP for HIV- negative members of heterosexual HIV</p>	<p>Study population: Offered to use PrEP services</p> <p>Sample Population: Serodiscordant couples Sample size (total – N): 1010 couples Gender distribution:</p>	<p>Nature of Intervention: PrEP was offered at enrolment at research site to all HIV-negative participants as PrEP with a daily dosing schedule; participants electing not to initiate PrEP at enrolment were</p>	<ul style="list-style-type: none"> • 97% of HIV-negative partners-initiated PrEP. • Median duration of PrEP use was 12 months (IQR 6-18) • Adherence: 71% of HIV-negative participants took ≥80% of expected doses

		serodiscordant couples in East Africa.	Males: 1010 Females 1010 Age distribution: HIV-: Age, years 30 (26, 36) HIV+: Age, years 28 (23, 35)	offered PrEP initiation at subsequent visits Intervention components: N/A Intervention delivery setting: Research site	<ul style="list-style-type: none"> 95% reduction (95% CI 86-98%, p<0.0001) in HIV incidence, relative to estimated HIV incidence for the population in the absence of PrEP integrated into HIV treatment services.
Research site^e	Ware et al. (2018) ⁵⁴ Uganda	Research article To evaluate the integrated strategy of delivering PrEP & ART to find out why it was successful.	Study population: Offered to use PrEP services Sample Sample size (total – N): 93 couples Gender distribution: Female HIV-uninfected partner: (46%) Age distribution: HIV uninfected partner: 31 (26 to 37) HIV infected partner 31 (25 to 37)	Nature of Intervention: The integrated strategy offered time-limited PrEP to uninfected partners as a "bridge" to long-term ART in the infected partner. Uninfected partners were offered PrEP at baseline and encouraged to discontinue once infected partners had used ART for six months. Intervention components: PrEP was integrated with ART	<ul style="list-style-type: none"> Couples viewed in services as hope for staying together, attending joint follow up appointments together increased mutual support, and travelling and waiting room time provided an opportunity for discussion, reflection and joint decision making. Concern for partner wellbeing was a reason for initiating ART whilst the simultaneous use of ARVs turned management of HIV into a shared experience Couples devised joint strategies for adhering to PrEP and ART such as mutual reminders and emotional and material support for adherence.
Research site	Atujuna et al. (2018) ²⁷ South Africa	Research article To explore acceptability and preferences for New biomedical prevention technologies (NPTs) among key and other vulnerable populations in two South African townships.	Study population: Never been offered to use PrEP services (hypothetical opinions related to PrEP) Sample Sample size (total – N) Adolescents=14 Gender distribution: Heterosexual women=10 Heterosexual men=9	Nature of Intervention: n/a Intervention components: n/a Intervention delivery setting: n/a	<ul style="list-style-type: none"> Different product preferences and motivations emerged by population based on similarity to existing practices and contexts of vulnerability. Adult women and female adolescents preferred a vaginal ring and HIV vaccine, motivated by longer duration of protection to mitigate feared repercussions from male partners, including threats to their marriage and

					<p>safety, and a context of ubiquitous rape.</p> <ul style="list-style-type: none"> • Male adolescents preferred an HIV vaccine, seen as protection in serodiscordant relationships and convenient in obviating the HIV stigma and cost involved in buying condoms. • Adult men preferred PrEP, given familiarity with oral medications and mistrust of injections, seen as enabling serodiscordant couples to have a child.
Research site^e	<p>Baeten et al. (2016)⁵⁰</p> <p>Kenya and Uganda</p>	<p>Research article</p> <p>To understand the delivery feasibility and uptake of, as well as adherence to, an integrated package of ART and PrEP among high-risk heterosexual HIV-1-serodiscordant couples</p>	<p>Study population: Offered to use PrEP services</p> <p>Sample <i>Sample size (total – N)</i> 1013 serodiscordant couples</p> <p>Gender distribution: HIV-1-uninfected partner Male: 679 (67%)</p> <p>Age distribution: HIV-1-uninfected partner Age <25 y=207 (20%), HIV-1-infected partner Age <25 y= 317 (31%)</p>	<p>Nature of Intervention: HIV- partners were offered PrEP which was provided at the study sites, as PrEP was not available otherwise in Kenya and Uganda during the study period. ART was offered at the study site or by referral to another HIV-1 care center of their choice</p> <p>Intervention components:</p> <ul style="list-style-type: none"> - Couples were offered antiretroviral medications - Counselling on HIV-1 prevention benefits <p>PrEP discontinued 6 months after the infected partner initiated antiretroviral treatment</p>	<ul style="list-style-type: none"> • ART was initiated by 789 (78%) HIV-1-infected partners. • 960/1 013 (95%) HIV-uninfected partners-initiated PrEP at enrolment, and 2% initiated PrEP at a later visit. • Among those initiating PrEP at enrolment and attending the month 1 and 3 visits, 840 (97%) and 792 (94%) continued to receive PrEP. • Adherence to PrEP measured by pill counts of returned, unused pills, indicated that 95% of dispensed pills had been taken as expected and 88% of periods between study visits had adherence >80%. • 14 initially HIV-1-seronegative partners seroconverted during follow-up (12 were infected at the time of study enrolment).

<p>Research site</p>	<p>Heffron et al. (2019)⁵¹</p> <p>Kenya</p>	<p>Research article</p> <p>To determine uptake, use and effectiveness of a comprehensive safer conception intervention among HIV-serodiscordant couples with immediate fertility desires.</p>	<p>Study population: Offered to use PrEP services</p> <p>Sample Population: Serodiscordant couples</p> <p>Sample size (total – N): 74</p> <p>Gender distribution: HIV-negative females/HIV positive males= 54%</p>	<p>Nature of Intervention: Couples attended monthly visits at the study clinic prior to pregnancy and quarterly visits during pregnancy. Couples were followed for 12 months or until the end of pregnancy. During all visits, couples received counselling about HIV prevention, information about how to track women's menstrual cycles and identify peak fertility days and how to conduct vaginal self-insemination</p> <p>Intervention components: The intervention package included antiretroviral therapy (ART) for HIV-positive partners, oral pre-exposure prophylaxis (PrEP) for HIV-negative partners, daily fertility and sexual behaviour tracking via short message service (SMS) surveys, counselling on self-insemination, and referrals for voluntary medical male circumcision and fertility care.</p>	<ul style="list-style-type: none"> • Of the 74 enrolled couples, 54% were HIV-negative female/HIV-positive male couples. • Prior to pregnancy, 100% of partners living with HIV used ART and 100% of HIV-negative partners-initiated PrEP. • One-month preceding pregnancy, 80.9% of HIV-positive partners were virally suppressed and 81.4% of HIV-negative partners were highly adherent to PrEP. • 42.6% pregnancies were protected using all four strategies i.e., men were circumcised, high adherence to PrEP, ART and timed condomless sex. • In addition to male circumcision, seven pregnancies (14.9%) were also protected by high adherence to PrEP and ART, 5 (10.6%) were protected by PrEP and timed condomless sex. • 0 HIV seroconversions (95% CI 0.0 to 6.0 per 100-person years) were observed indicating a 100% reduction in HIV risk (p = 0.04).
<p>Research Site</p>	<p>Minnis et al (2020)⁵⁶</p> <p>South Africa</p>	<p>Research article</p> <p>Examined youths' preferences for key attributes of long-acting PrEP, with a focus on characteristics pertinent to product delivery alongside key modifiable product attributes.</p>	<p>Study population: Never been offered to use PrEP services (hypothetical opinions related to PrEP)</p> <p>Sample Sample size (total – N): 807</p> <p>Gender distribution: Female: 401 (50%); Men who have sex with women only (MSW): 216 (27%).</p>	<p>Nature of Intervention: Participants were asked to choose between two hypothetical PrEP products composed of five attributes product form (injection, implant); dosing frequency (two, six or twelve months); where to obtain the product (clinic, pharmacy, community</p>	<ul style="list-style-type: none"> • All three subgroups had strong preference for a product with a one-year duration over two months (p < 0.001). • MSW placed the most importance on dosing frequency, with it being five times more important than any other attribute.

			<p>Men who have sex with men MSM): 190 (23%)</p> <p>Age distribution: Median age (IQR): Female: 21 (19 to 22); men who have sex with women only: 21 (19 to 22) men who have sex with men: 20 (19 to 22)</p>	<p>distribution, mobile clinic - all models for current HIV prevention and contraceptive service delivery); pain involved with injection or insertion (mild, moderate) and delivery location on the body (arm, buttock, thigh).</p> <p>Intervention components: Participants completed interviews on a tablet computer. The survey first introduced each attribute individually with both visual and narrative descriptions. Participants were then presented with nine DCE choice questions, each one a unique choice NB: PrEP was not provided in this study.</p>	<ul style="list-style-type: none"> • Females had greater preference for a single injection over an implant compared to MSW ($p \leq 0.004$). • Females and MSW expressed more preference for two injections compared with implants ($p \leq 0.009$). • Females preferred using a product that was offered at a health clinic over accessing it at a pharmacy ($p < 0.001$). • All youth preferred product insertion in the arm ($p < 0.001$). • Females disliked insertion in the thigh and both MSW and MSM disliked insertion on the buttocks ($p = 0.01$). • Youth indicated strong preferences for longer duration products. <p>Each attribute nonetheless influenced preferences, offering insight into trade-offs that inform long-acting PrEP development.</p>
Other					
Not described	Jani et al. (2018) ⁵⁹ Tanzania	Conference abstract To describe support for PrEP use among male partners of AGYW in Tanzania via a qualitative comparative analysis of AGYW's and male partners of AGYW's views	<p>Study population: Never been offered to use PrEP services (hypothetical opinions related to PrEP)</p> <p>Sample Sample size (total – N): not described Gender distribution: not described Age distribution: not described</p>	<p>Nature of Intervention: Prior to IDIs and FGDs participants were acquainted with PrEP, by sharing a visual, standardized script of PrEP information with them. 24 IDIs and 4 FGDs with AGYW; 16 IDIs with men</p> <p>Intervention components: PrEP for AGYW</p>	<ul style="list-style-type: none"> • AGYW and male partners agreed that most male partners would be willing to support PrEP use by AGYW. • However, male partner support might be contingent on their early involvement in the decision-making process regarding PrEP. • Early inclusion was perceived to remove suspicion of infidelity and alleviate negative consequences associated with

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					<p>late or inadvertent disclosure of PrEP use.</p> <ul style="list-style-type: none"> • AGYW suggested potential social harms (relationship dissolution, loss of financial support, and verbal and physical violence) if male partners are not involved whilst male partners denied such potential extreme consequences. • Male participants recommended strategies on gaining men’s support of PrEP including providing education to men on PrEP, equipping AGYW with skills to educate their partners, couples counselling by providers, provision of PrEP for men, and community education and sensitization. • Educating male partners about PrEP and engaging them in implementation activities should be part of PrEP roll-out strategies for AGYW.
Not described	Makyao et al. (2018) ⁶⁰ Tanzania	Conference abstract To explore how social norms and gendered parenting roles might influence parental support of AGYW's PrEP use.	<p>Study population: Never been offered to use PrEP services (hypothetical opinions related to PrEP)</p> <p>Sample <i>Sample size (total – N):</i> 55 <i>Gender distribution:</i> Female parents: 28; Male parents: 27 <i>Age distribution:</i> not described</p>	<p>Nature of Intervention: Prior to IDIs and FGDs participants were acquainted with PrEP, by sharing a visual, standardized script of PrEP information with them. 4 FGDs with male parents and 4 FGDs with female parents</p> <p>Intervention components: PrEP for AGYW</p>	<ul style="list-style-type: none"> • Parents supported PrEP availability recognizing AGYW's high risk of HIV due to limited power to negotiate preventative behaviours and frequent violence in sexual relationships. • Differential parenting roles influenced the type of support. Men noted shame and embarrassment in communicating with their

					<p>daughters about relationships and sex.</p> <ul style="list-style-type: none"> • Social norms around adolescent sexuality influenced parental support. Parents were wary of being viewed as condoning pre-marital sexual activity, while they worried that AGYW could be stigmatized as promiscuous. • Parents recommended strategies for supporting their daughters PrEP use included: creating a supportive environment for PrEP use (e.g., ensuring good diet) while male parents described offering logistical and material support (e.g., providing transport to health centres).
n/a Modelling	Cremin et al. (2015) ⁵⁷ Mozambique	<p>Research article</p> <p>The aim of this paper is to estimate the prevention impact and the cost effectiveness of providing time-limited PrEP to partners of migrant miners in Gaza, Mozambique.</p>	<p>Study population: Never been offered to use PrEP services (hypothetical opinions related to PrEP)</p> <p>Sample Population: adult heterosexual</p> <p>Sample size (total – N): Note mentioned (modelling)</p> <p>Gender distribution: N/A</p> <p>Age distribution: N/A</p>	<p>Nature of Intervention: n/a</p> <p>Intervention components: n/a</p> <p>Intervention delivery setting: n/a</p>	<ul style="list-style-type: none"> • Providing time-limited PrEP to partners of migrant miners in Gaza Province during periods of increased exposure would be a novel strategy for providing PrEP. This strategy would allow for a better prioritized intervention, with the potential to improve the efficiency of a PrEP intervention considerably, as well as providing important reproductive health benefits
n/a Modelling	Irungu et al. (2019) ⁵⁸ Kenya	<p>Research article</p> <p>To provide estimates of the cost of delivering antiretroviral-based HIV prevention to HIV serodiscordant couples in</p>	<p>Study population: Never been offered to use PrEP services (hypothetical opinions related to PrEP)</p> <p>Sample Population: Heterosexual couples</p> <p>Sample size (total – N): N/A</p>	<p>Nature of Intervention: n/a</p> <p>Intervention components: n/a</p>	<ul style="list-style-type: none"> • Time-limited provision of PrEP to the HIV uninfected partner within HIV serodiscordant couples can be an affordable delivery model implemented in HIV care programs in Kenya and similar settings. These

		public health facilities in Kenya and the incremental cost of providing PrEP as a component of this strategy.	<p>Gender distribution: none provided</p> <p>Age distribution: No age disaggregation</p>		costs can be used for budgetary planning and cost effectiveness analyses.
n/a Modelling ^e	Ngure et al. (2020) ³⁴ Kenya and Uganda	Research article To estimate the associations between effective contraceptive use and 1) PrEP dispensation 2) high effective PrEP use	<p>Study population: Offered to use PrEP services</p> <p>Sample Population: Sample size (total – N): 311</p> <p>Gender distribution: Female: 100%</p> <p>Age distribution: Median age: 29 years ([IQR] 24.0-35.0)</p>	<p>Nature of Intervention: HIV-uninfected women were provided with both PrEP and effective contraception</p> <p>Intervention components: PrEP was integrated with ART</p>	<ul style="list-style-type: none"> • PrEP dispensation was more frequent among those concurrently using effective contraception, (adjusted relative risk [aRR]=1.19; 95% confidence interval [CI]=1.08-1.32) and contraceptive use was more common among those on PrEP (aRR=1.63; 95% CI=1.18-2.25). • Healthcare delivery models that integrate the provision of family planning and PrEP may successfully promote both preventive products, especially long-acting contraception

a. Conducted in the context of the Girl Power study b. Conducted in the context of the PrEP Implementation in Young Women and Adolescents (PriYA) study c. Conducted in the context of the Prevention Option for Women Evaluation Research (POWER) project d. Conducted in the context of the Sustainable East Africa Research in Community Health (SEARCH) study e. Implemented within The Partners Demonstration Project

Author	Item										11
	1	2	3	4	5	6	7	8	9	10	
Qualitative studies using the CASP Tool ²²											
Atujuna et al., 2018 ⁵¹	+	+	+	+	+	+	+	+	+	+	
Bassett et al., 2019 ⁴⁶	+	+	+	?	+	?	+	+	+	+	
Bell et al., 2019 ^{36*}	+	+	+	?	?	-	-	?	-	?	
Camlin et al., 2020 ⁴²	+	+	+	+	+	+	+	+	+	+	
Gombe et al., 2020 ⁴⁴	+	+	?	?	+	+	+	+	+	+	
Jani et al., ⁵⁵	+	+	+	?	?	-	?	?	+	?	
Makyao et al., ⁵⁶	+	+	+	?	?	-	-	?	?	?	
Maseko et al., ²⁵	+	?	-	-	+	?	-	+	?	?	
Ngure et al., 2016 ³⁸	+	+	+	+	+	+	+	+	+	+	
Pintye et al., 2019 ²⁹	+	+	+	?	+	?	?	?	+	+	
Ware et al., 2018 ⁵⁰	+	+	+	+	+	?	+	?	?	?	
Morton et al., 2020 ^{48*}	+	+	+	+	+	-	+	?	+	+	
Were et al., 2020 ^{35*}	+	+	+	+	+	+	+	+	+	+	
Sack et al., 2021 ⁵¹	+	+	+	+	+	+	+	+	+	+	
Comparative studies including randomised trials, nonrandomised trials, interrupted time series and controlled-before after studies using the EPOC tool ²¹											
Delany-Moretlwe et al., 2018 ³⁴	?	?	+	?	?	?	?	?	?		
Koss et al., 2018 ³⁹	-	?	+	+	?	+	+	+	+		
Donnell et al., 2021 ³⁴	?	?	+	+	?	?	?	+	+		
Studies involving descriptions of interventions, implementation or policy processes with very limited empirical data and other non-conventional sources using the WEIRD tool ²³											
Baetan et al., 2016 ⁵²	+	+	+	!	+	N/A	!	+	+	+	+
Bassett et al., 2018 ⁴⁵	+	+	?	+	+	+	?	+	+	+	+
Bell et al., 2019 ^{36*}	!	-	-	?	?	?	?	-	?	-	-
Heffron et al., 2018 ⁴⁹	+	?	!	?	?	+	?	+	+	+	+
Heffron et al., 2018 ³⁷	+	!	!	!	-	!	?	?	?	+	+

Kinuthia et al.,2020 ²⁸	+	+	+	!	?	N/A	!	!	!	+	+
Koss et al., 2020 ⁴⁰	?	?	?	?	?	?	?	?	?	?	?
Koss et al.,2017 ⁴³	-	-	-	-	-	+	?	?	+	?	-
Lubwama et al., 2019 ⁴⁷	-	+	-	?	N/A	!	-	-	?	+	-
Mayer et al.,2019 ⁴¹	+	+	+	+	+	N/A	!	+	+	+	+
Mugwanya et al.,2019 ²⁶	+	+	?	?	!	!	!	!	!	+	!
Ongwen et al.,2019 ³²	!	!	?	!	+	N/A	!	-	!	?	-
Pintye et al.,2018 ²⁷	+	!	!	!	?	?	?	!	!	?	?
Rousseau et al.,2019 ³³	?	?	?	?	?	?	?	?	?	?	?
Travill et al.,2018 ³¹	!	?	?	!	?	?	?	-	-	-	-
Hill et al.,2020 ³⁰	+	+	+	+	+	+	+	+	+	+	+
Morton et al.,2020 ^{48*}	+	+	+	+	+	+	+	+	+	!	+
Minnis et al.,2020 ⁵⁴	+	+	+	+	+	+	+	+	+	+	+
Were et al.,2020 ^{35*}	+	+	+	+	+	+	+	+	+	+	+

+=Yes/Low risk/No or very minor concerns; -=No/High risk/Serious concerns'; ?=Can't tell/Unclear risk/Moderate concerns; !=Minor concerns

*Mixed methods study, Modelling studies were not appraised

Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) Checklist

SECTION	ITEM	PRISMA-ScR CHECKLIST ITEM	REPORTED ON PAGE #
TITLE			
Title	1	Identify the report as a scoping review.	1
ABSTRACT			
Structured summary	2	Provide a structured summary that includes (as applicable): background, objectives, eligibility criteria, sources of evidence, charting methods, results, and conclusions that relate to the review questions and objectives.	2
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of what is already known. Explain why the review questions/objectives lend themselves to a scoping review approach.	3-5
Objectives	4	Provide an explicit statement of the questions and objectives being addressed with reference to their key elements (e.g., population or participants, concepts, and context) or other relevant key elements used to conceptualize the review questions and/or objectives.	5
METHODS			
Protocol and registration	5	Indicate whether a review protocol exists; state if and where it can be accessed (e.g., a Web address); and if available, provide registration information, including the registration number.	6
Eligibility criteria	6	Specify characteristics of the sources of evidence used as eligibility criteria (e.g., years considered, language, and publication status), and provide a rationale.	6-7
Information sources*	7	Describe all information sources in the search (e.g., databases with dates of coverage and contact with authors to identify additional sources), as well as the date the most recent search was executed.	7
Search	8	Present the full electronic search strategy for at least 1 database, including any limits used, such that it could be repeated.	7
Selection of sources of evidence†	9	State the process for selecting sources of evidence (i.e., screening and eligibility) included in the scoping review.	7
Data charting process‡	10	Describe the methods of charting data from the included sources of evidence (e.g., calibrated forms or forms that have been tested by the team before their use, and whether data charting was done independently or in duplicate) and any processes for obtaining and confirming data from investigators.	7
Data items	11	List and define all variables for which data were sought and any assumptions and simplifications made.	7
Critical appraisal of individual sources of evidence§	12	If done, provide a rationale for conducting a critical appraisal of included sources of evidence; describe the methods used and how this information was used in any data synthesis (if appropriate).	7



SECTION	ITEM	PRISMA-ScR CHECKLIST ITEM	REPORTED ON PAGE #
Synthesis of results	13	Describe the methods of handling and summarizing the data that were charted.	8
RESULTS			
Selection of sources of evidence	14	Give numbers of sources of evidence screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally using a flow diagram.	8-9
Characteristics of sources of evidence	15	For each source of evidence, present characteristics for which data were charted and provide the citations.	9-28
Critical appraisal within sources of evidence	16	If done, present data on critical appraisal of included sources of evidence (see item 12).	29
Results of individual sources of evidence	17	For each included source of evidence, present the relevant data that were charted that relate to the review questions and objectives.	29-33
Synthesis of results	18	Summarize and/or present the charting results as they relate to the review questions and objectives.	29-33
DISCUSSION			
Summary of evidence	19	Summarize the main results (including an overview of concepts, themes, and types of evidence available), link to the review questions and objectives, and consider the relevance to key groups.	33-36
Limitations	20	Discuss the limitations of the scoping review process.	36
Conclusions	21	Provide a general interpretation of the results with respect to the review questions and objectives, as well as potential implications and/or next steps.	36
FUNDING			
Funding	22	Describe sources of funding for the included sources of evidence, as well as sources of funding for the scoping review. Describe the role of the funders of the scoping review.	37

JBI = Joanna Briggs Institute; PRISMA-ScR = Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews.

* Where *sources of evidence* (see second footnote) are compiled from, such as bibliographic databases, social media platforms, and Web sites.

† A more inclusive/heterogeneous term used to account for the different types of evidence or data sources (e.g., quantitative and/or qualitative research, expert opinion, and policy documents) that may be eligible in a scoping review as opposed to only studies. This is not to be confused with *information sources* (see first footnote).

‡ The frameworks by Arksey and O'Malley (6) and Levac and colleagues (7) and the JBI guidance (4, 5) refer to the process of data extraction in a scoping review as data charting.

§ The process of systematically examining research evidence to assess its validity, results, and relevance before using it to inform a decision. This term is used for items 12 and 19 instead of "risk of bias" (which is more applicable to systematic reviews of interventions) to include and acknowledge the various sources of evidence that may be used in a scoping review (e.g., quantitative and/or qualitative research, expert opinion, and policy document).

From: Tricco AC, Lillie E, Zarin W, O'Brien KK, Colquhoun H, Levac D, et al. PRISMA Extension for Scoping Reviews (PRISMA-ScR): Checklist and Explanation. *Ann Intern Med.* 2018;169:467–473. doi: 10.7326/M18-0850.



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Service delivery models that promote linkages to PrEP for adolescent girls and young women and men in sub-Saharan Africa: A scoping review

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Title

Service delivery models that promote linkages to PrEP for adolescent girls and young women and men in sub-Saharan Africa: A scoping review

Authors

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Abstract

Background: Pre-exposure prophylaxis (PrEP) is an emerging biomedical prevention intervention. Documenting PrEP service delivery models (SDMs) that promote linkage to and continuation of PrEP will inform guidelines and maximise roll out.

Objectives: To synthesize and appraise the effectiveness and feasibility of PrEP SDMs designed to promote linkage to PrEP care among adolescent girls and young women (AGYW) and men in sub-Saharan Africa (SSA).

Eligibility criteria: Primary quantitative and qualitative studies published in English and conducted in SSA were included. No restrictions on the date of publication were applied.

Sources of evidence: Methodology outlined in the Joanna Briggs Institute reviewers' manual was followed. PubMed, Cochrane library, Scopus, Web of Science, and online-conference abstract archives were searched.

Charting methods: Data on article, population, intervention characteristics and key outcomes was charted in REDCap.

Results and Conclusion: Of the 1204 identified records, 37 (met the inclusion criteria. Health facility-based integrated models of PrEP delivery with family planning, maternal and child health or sexual and reproductive services to AGYW resulted in PrEP initiation of 16-90%. Community-based drop-in centres (66%) was the preferred PrEP outlet for AGYW compared to public clinics (25%) and private clinics (9%). Most men preferred community-based delivery models. Among individuals who initiated PrEP, 50% were men, 62% were <35 years old and 97% were tested at health fairs compared to home testing. Integrated antiretroviral therapy (ART)-PrEP delivery was favoured among serodiscordant couples with 82.9% of couples using PrEP or ART with no HIV seroconversions. PrEP initiation within healthcare facilities was increased by perceived client-friendly services and non-judgmental healthcare workers. Barriers to PrEP initiation included distance to travel to and time spent at health facilities and perceived community stigma. PrEP SDMs for AGYW and men need to be tailored to the needs and preferences for each group. Programme implementers should promote community-based SDMs to increase PrEP initiation among AGYW and men.

Key words: Pre-exposure prophylaxis, PrEP, linkage, adolescent girls, and young women, AGYW, men, sub-Saharan Africa

Strengths and limitations of this study

- A comprehensive search strategy was developed, and the search was carried out across multiple databases and conference archives.
- The methodology used in the scoping review was robust and included double data screening, extraction, and synthesis.
- All included studies underwent critical appraisal of sources of evidence using approved tools.
- Studies not conducted in SSA and that were published in non-English languages were excluded.
- Most of the included studies were from Kenya, Uganda, and South Africa limiting the generalizability of the results.

Background

Recent reports indicate a decline in new HIV infections globally. However, this decline is occurring at a slower pace in regions with generalized HIV epidemics such as sub-Saharan Africa (SSA). In 2017, SSA accounted for 64% of new HIV infections globally.¹ Two underserved populations that are critical to drive the decline in new HIV infections are adolescent girls and young women (AGYW; 15-24 years) and men (25-65 years). AGYW are at substantial risk for HIV-infection with an estimated 310 000 new infections globally in 2018 – 86% of which was in SSA.¹ Men, on the other hand, account for more AIDS-related deaths globally than women – 400 000 deaths in men in 2018 compared to 270 000 in woman.¹

For differing reasons, AGYW and men show lower health seeking behaviour because of interpersonal and structural factors. AGYW's access to health services is limited by stigma, negative attitudes from healthcare workers and inconvenient clinic operating hours.² However, 'man unfriendly clinics' are characterised by inaccessible clinic hours/locations, difficulty in engaging with female staff, and gender norms that discourage men from accessing health services.^{3 4}

Amongst the 2020 Global Prevention Targets and Commitments is the reduction in the number of AGYW newly infected with HIV globally to below 100 000, and to ensure that 3 million people at substantial risk of contracting HIV have access to pre-exposure prophylaxis (PrEP).⁵ To achieve these targets, primary prevention programmes should be structured around five central pillars: (1) combination prevention for AGYW; (2) combination prevention with key populations; (3) voluntary medical male circumcision (VMMC) and sexual and reproductive health services (SRHS) for men and boys; (4) comprehensive condom

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3 programmes; and (5) rapid introduction of PrEP.⁵ PrEP for HIV refers to the use of
4 antiretroviral drugs among HIV-negative people to prevent the acquisition of HIV.⁶
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7 PrEP has shown effectiveness in reducing HIV acquisition among couples, sex workers, men
8 who have sex with men (MSM), transgender and people who inject drugs and AGYW.⁷ The
9 impact of PrEP on the HIV epidemic depends on the extent of PrEP initiation among people
10 at substantial risk for HIV infection (World Health Organization (WHO) defined substantial risk
11 of HIV acquisition as HIV incidence of 3 per 100 person-years or higher in the absence of
12 PrEP).^{7,8} Since September 2015, the WHO recommended offering oral PrEP to every person
13 at substantial risk of contracting HIV.⁷ In the current South African guidelines for PrEP, specific
14 populations considered to be at substantial risk of HIV infection include AGYW, MSM, people
15 with more than one sexual partner, people who inject drugs, people with a recent history of
16 sexually transmitted infections, people who recognise their own risk and request PrEP,
17 serodiscordant couples if the HIV positive partner is not virally suppressed, and sex
18 workers.^{9,10}
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26 Literature on PrEP has largely been focused on knowledge, attitudes, and interest in PrEP. As
27 countries scale up use of PrEP as part of their combination prevention packages, evidence on
28 service delivery models (SDMs) that promote initiation and continuation on PrEP are needed
29 especially among vulnerable and hard to reach populations such as AGYW and men. HIV
30 prevention cascades have been proposed as a logical framework to monitor populations at
31 substantial risk for HIV acquisition as they navigate the steps from HIV testing to assessing the
32 risk of the individual to determining PrEP eligibility before PrEP initiation and continuation or
33 discontinuation.⁸ PrEP initiation (step 5) represents a critical step in the PrEP cascade (Figure
34 1),^{8,10} because it reflects people's awareness and interest in lowering their risk for HIV.
35 Differentiated models, which are centred around clients' needs and expectations and
36 relieving unnecessary burdens on the health system while targeting behavioural and
37 structural determinants of AGYW and men, can potentially increase acceptability and
38 accessibility of PrEP. These include innovative strategies that streamline HIV testing, link
39 AGYW and men to HIV prevention services, provide differentiating medication access points,
40 reduce stigma and barriers of parental consent for PrEP initiation.¹¹ PrEP SDMs should be
41 designed with the populations being served central to the design.¹²
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[Insert Figure 1 here]

Figure 1: Oral PrEP cascade: Adapted from Dunbar et al (2018)⁸

Following an HIV-negative diagnosis (step 1), an individual is assessed for risk of HIV (step 2). An individual at substantial risk of HIV acquisition or who requests pre-exposure prophylaxis (PrEP) is assessed for eligibility for PrEP (step 3). After documenting eligibility for PrEP use, several baseline clinical investigations are conducted (step 4 PrEP is initiated (step 5) on the same-day as HIV testing. The recommended regimen is Tenofovir (TDF) / emtricitabine (FTC) 1 tablet by mouth daily. PrEP continuation visits (step 6) include: month 1, every 3 months. PrEP is discontinued (step 7) if the individual tests HIV positive, develops renal disease, is non-adherent, does not want or need PrEP, no longer meets eligibility criteria, or if there are safety concerns.

There is a gap in knowledge on the characteristics of AGYW and men who initiate PrEP compared to those who do not initiate PrEP. This information is critical for informing national policies and implementation guidelines for PrEP roll-out. As such, the aim of this review was to synthesize and appraise the effectiveness and feasibility of PrEP SDMs designed to promote linkage to care among AGYW and men eligible for PrEP in SSA. The objectives were to a) summarize SDMs that promote PrEP initiation and b) explore users' perceptions, and barriers and facilitators of these PrEP models.

Methods

We used a scoping review design to map existing literature, explore the research studies conducted and identify research and knowledge gaps in models used to deliver PrEP.¹³ Scoping reviews can be of particular use when the topic has not yet been extensively reviewed or is of a complex or heterogeneous nature.¹⁴ The research question was defined using the Population- Intervention-Comparison-Outcome (PICO) framework (Table 1). We defined our outcomes as i) Linkage to PrEP care (defined as the proportion of AGYW or men who are initiated on PrEP following an HIV-negative diagnosis, step 7 of Figure 1) and ii) perceptions, barriers, and facilitators of PrEP SDMs. The service delivery model was defined as the setting used for delivery of PrEP viz. facility-only, community-only, research-only, mobile-only and a hybrid model encompassing two or more of the above settings.

Table 1: Scoping review population, intervention, and outcome

Population	Heterosexual females (15-24 years) and men (25-65 years)
Intervention	Interventions (SDMs) designed to improve PrEP initiation
Comparison	Not applicable
Outcome	Linkage to PrEP care (defined as the proportion of AGYW or men who are initiated on PrEP following a HIV-negative diagnosis) and perceptions on SDMs

Protocol and registration

This review was conducted and reported in line with the Joanna Briggs Institute (JBI) reviewer's manual and structured using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for scoping reviews (PRISMA-ScR).^{15 16} A review protocol for this scoping review was registered with the Open Science Framework (DOI 10.17605/[OSF.IO/EG9TD](https://doi.org/10.17605/OSF.IO/EG9TD)).

Research ethics approval

The scoping review focuses on published research in the public domain therefore no ethics approval is required.

Patient and public involvement

No patients or public were involved in the study.

Eligibility criteria

We included primary studies on PrEP service delivery models for AGYW and men, with both qualitative and quantitative study designs published in English and conducted in SSA. No restrictions on the date of publication were applied (last literature search was conducted in July 2021). Table 2 details the inclusion criteria applied to studies. We excluded studies that were focused exclusively on key population groups in HIV programmes such as lesbian, gay, bisexual, MSM etc. and publication types (e.g., systematic reviews, case studies, etc).

Table 2: Eligibility criteria describing study inclusion criteria for the scoping review

Study type	Quantitative studies including randomized clinical trials (RCT), quasi-randomized, and non-RCTs, longitudinal observational (historical cohorts, prospective cohorts, case-control, and before-and-after studies), analytic cross-sectional studies, and non-comparative studies
	Qualitative studies using any study design
Population	Study population included heterosexual females (15-24 years) and males (25-65 years)
Outcomes	Focus of research: PrEP SDMs i.e., service provision / implementation science / models of care / differentiated care / linkage to care / intervention
	Papers reporting on barriers and facilitators of PrEP SDMs
	Papers on user perceptions of PrEP SDMs
Setting	Sub-Saharan African countries – based on the World Bank's country classification ¹⁷

Information sources and search strategy

PubMed, Cochrane library, Scopus, and Web of Science including three online conference archives (AIDS conference, Conference on Retroviruses and Opportunistic Infections and International AIDS Society Conference on HIV Science) were searched. The reference list of systematic reviews was checked to identify relevant primary studies. The three-step search strategy recommended by the JBI Reviewer's Manual was used.¹⁵ During the first step, one author (WC) conducted an elementary search on PubMed to establish the volume of relevant articles on the topic. Two authors (WC and TR) then screened the title and abstract of the retrieved articles to identify keywords and index terms which were used to build a search strategy (see online supplementary appendix 1). The final search results were exported into EndNote,¹⁸ and duplicates were removed.

Selection of sources of evidence

Titles and abstracts were double screened in Rayyan¹⁹ by any two of a group of eight independent authors (TR, WC, KJ, NJ, DG, TMA, MH, ET). There was no restriction placed on age range during the screening phase to ensure that articles with age disaggregated analysis were included. Full text articles and conference abstracts, including articles from the 2020 AIDS conference were retrieved and independently double screened by WC and TR.

Data charting process and data items

Using a pre-designed data-charting form, key and relevant information were systematically extracted from full-text articles in REDCap²⁰ by any two of a group of ten independent authors (TR, WC, TMA, NJ, DG, BZ, CM, MH, ET, EN). We charted data on article characteristics, population characteristics, intervention characteristics, and key outcomes (Table 1).

Critical appraisal of individual sources of evidence

Information for quality assessment was incorporated into the data charting form on REDCap.²⁰ Due to the different study designs and research methodologies adopted in the included studies, we used three different tools to appraise the articles. For comparative studies including randomised trials, non-randomised trials, interrupted time-series and controlled before-after-studies, we used the risk of bias criteria recommended by the Effective Practice and Organisation of Care (EPOC).²¹ For qualitative studies, we used the Critical Appraisal Skills Programme (CASP) checklist.²² For other studies we used the Ways of Evaluating Important and Relevant Data (WEIRD) tool.²³ Modelling studies were excluded from the appraisal step.

Analysis

For quantitative studies we used a narrative analysis and tabulated data by gender and by SDM. We summarized the settings, populations, and sample for each group, along with the interventions and findings. For qualitative studies, we did a thematic analysis that resulted in

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3 organising the data into themes, authors' interpretations, and quotes and integrated these
4 findings to support the quantitative data. We tabulated the data by SDMs (health facility,
5 community, research, or mobile) and by population (AGYW only, men only, or models for
6 both). Furthermore, we determined the existing gaps in the different categories of
7 interventions that can be strengthened to promote initiation and continuation on PrEP among
8 AGYW and men.
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12 13 **Results**

14 **Selection of sources of evidence**

15 Our search identified 1604 citations. After duplicates (413) were removed, a total of 1204
16 titles and abstracts were identified from searches of electronic databases and 13 from other
17 sources including conferences. The PRISMA flow diagram (Figure 2) illustrates the screening
18 process to identify records that meet the study inclusion criteria. Based on the screening of
19 title and abstracts, 1102 records were excluded, with 102 full text articles and conference
20 abstracts to be retrieved and assessed for eligibility. From the review of full text articles 67
21 were excluded for the following reasons: editorials/commentaries/reviews/protocols,
22 interviews with stakeholders, articles on topical PrEP, wrong outcome and focus on key
23 populations. During data charting, two additional articles were excluded. Four additional
24 articles were added after the initial search process, these articles were identified following
25 the 2020 AIDS conference in July. The final number of studies that were considered eligible
26 for this scoping review were 37 (27 studies and 10 conference abstracts).
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35 **[Insert Figure 2 here]**

36 **Figure 2:** PRISMA flow diagram

37 Adapted from: Moher et al²⁴

38 **Description of sources of evidence**

39 A description of the characteristics, setting, SDMs and intervention modalities of the included
40 studies are provided in online supplementary appendix 2. There was a mixture of quantitative
41 (n=23), qualitative (n=11) and mixed method studies (n=3). Most studies were
42 demonstration/IS projects (n=10) while other methodological approaches included
43 randomised controlled trials (RCTs) (n=5) and cross-sectional studies (n=5). Most were
44 conducted in Kenya (n=17), with the remainder conducted in Uganda (n=10), South Africa
45 (n=10), Tanzania (n=3), Malawi (n=2), Mozambique (n=2), and Zimbabwe (n=1). These studies
46 reported evidence on the following PrEP SDMs; health facility (6), mobile (1), research site
47 (8), community (6), hybrid (10), and not described/not applicable (6). Thirteen studies focused
48 on AGYW, 19 studies focused on AGYW and men, one study focused on men only, and four
49 were classified as other (i.e., age categories were not specified). PrEP services were offered
50 in 25 of the 37 studies whilst PrEP perceptions/opinions were assessed in the other 12 studies.
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Critical appraisal of evidence

Full text articles appraised using the WEIRD tool were mostly assessed as having either no or very minor or moderate concerns for items that were unclear in the article (see online supplementary appendix 3). Most of the qualitative studies or abstracts performed well on all items except on items 4 (the recruitment strategy was appropriate to the aims), 8 (the rigour of the data analysis) and 10 (the value of the research in terms of its contribution to the literature and/or policy and process). Due to limited information in the abstracts to clearly answer the items using the WEIRD tool, most of the abstracts were appraised as either having an unclear or serious risk of bias.²⁵⁻³⁰

Results of sources of evidence

PrEP SDMs for AGYW

Amongst AGYW, PrEP SDMs were found in HF-B (n=6), hybrid (mobile clinic-healthcare facility or community-healthcare facility, n=3), research site (n=2) and mobile clinic (n=1) (see online supplementary appendix 2).

Health facility

Three studies from Kenya evaluated a HF-B delivery modality by integrating PrEP delivery into routine services. Mugwanya et al.³¹ evaluated a PrEP-dedicated nurse-led integrated delivery of PrEP in family planning (FP) clinics whilst Kinuthia et al. and Pintye et al. evaluated approaches to integrate PrEP into maternal and child health (MCH) clinics providing antenatal care (ANC) and post-natal care (PNC).^{32 33} Integration of universal screening and counselling for PrEP in FP and MCH clinics resulted in PrEP initiation of 16% and 49.2% respectively among AGYW. Younger women (≤ 24 years) who initiated PrEP at MCH clinics were significantly more likely to return for a PrEP refill at month 3 compared to women >24 years (54.9% versus 45.1%) ($p=0.05$).³² These studies utilised nurses dedicated to providing PrEP services only, which may limit applicability in a sub-Saharan setting where facilities have a limited clinical workforce. A study by Ngunjiri et al. which integrated PrEP with FP services found that PrEP dispensation was more frequent among those concurrently using effective contraception, (adjusted relative risk [aRR]=1.19; 95% confidence interval [CI]=1.08-1.32) and contraceptive use was more common among those on PrEP (aRR=1.63; 95% CI=1.18-2.25), highlighting the importance of SDMs that integrate PrEP with FP services.³⁴ Pintye et al. found that participants who initiated PrEP at MCH clinics took an additional 18 minutes for PrEP related activities over and above the time spent at the clinic to receive routine MCH services. The additional time could deter AGYW from initiating and continuing PrEP and depending on healthcare facility size and patient volume integrating PrEP into these routine services could result in several additional hours of work for nurses.³³ A recent study in Malawi comparing four SDMs (Model 1: standard of care, Model 2: integrated youth-friendly services, Model 3: Model 2 plus a small-group behavioural intervention, and Model 4: Model 3 plus cash transfer) found that PrEP initiation will best be promoted in youth-friendly locations such as

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3 schools because of ease of access and comfort in the absence of adult patients and family
4 members.
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6 Hybrid (community-health facility)

7 Two studies evaluated the scaling up of PrEP in Kenya through integration into routine health
8 services in drop-in centres (DICEs), public and private health facilities designed primarily for
9 sex workers.^{28 35} Ongwen et al. reported that within the context of the Jilinde project, which
10 implements oral PrEP as a routine service at a public health scale in Kenya, 6.5% (n=1851)
11 AGYW initiated PrEP, and DICEs were the preferred PrEP outlet for adolescent girls with 66%
12 accessing services in DICEs, 25% in public clinics and 9% in private clinics. Amongst AGYW who
13 initiated PrEP, the entry channel into the PrEP pathway was through peer educators and
14 networks (50%); community outreaches (20%); and within health facilities (30%).²⁸ Were et
15 al. found that among all individuals eligible for PrEP in the study which included female sex
16 workers and MSM, 11% of AGYW initiated PrEP.³⁵ The majority (81%) of clients initiated PrEP
17 through DICEs, whereas 14% and 5% were initiated through public and private facilities
18 respectively. The majority of AGYW did not persist on PrEP use at month-1 (68% drop off) and
19 month-3 (94% drop off) follow-ups. Qualitative evidence from this study found that AGYW
20 who initiated PrEP in public and private health facilities reported insensitive referral and
21 access to the PrEP delivery pathways where "*The (HIV) testing place is different from the place*
22 *I was asked questions and the place for collecting the medicine is also different. We took long*
23 *because we were walking form one place to another*".³⁵
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33 Research site

34 Delany-Moretlwe conducted an RCT in Tanzania and South Africa to evaluate whether
35 empowerment clubs increased PrEP initiation and continuation among AGYW. Participants
36 were randomised to the standard of care (SoC), which included comprehensive SRHS, with
37 counselling and short message service (SMS) reminders for PrEP users, or to empowerment
38 clubs plus SoC. Facilitators-led small group sessions and clinic follow-up visits for sexually
39 active AGYW on PrEP. Across both arms, 97% initiated PrEP. PrEP continuation did not vary
40 significantly by study arm and diminished with time (73% at Month-1, 61% at Month-3 and
41 34% at Month-6).³⁶ Donnell et al. found that HIV incidence declined significantly after on-site
42 provision of PrEP at the research sites.³⁷ Hill et al. found that epidemiologic HIV risk scores
43 were positively associated with PrEP interest, and that high numbers of AGYW both above
44 and below the high-risk cut-off were very interested in PrEP (68% vs. 63%).³⁸
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51 Mobile

52 A South African study found that integrating PrEP with SRHS and delivering it via an
53 adolescent-friendly mobile clinic led to an increase in both PrEP initiation and contraception.
54 AGYW who were using contraception were significantly more likely to initiate PrEP (76%) on
55 the same-day compared to those who were not using contraception and declined PrEP (66%)
56 (p=0.001). Contraception was initiated by 44% of AGYW on the same-day as PrEP initiation
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3 compared to 30% who declined PrEP ($p=0.003$).²⁹ No qualitative evidence on the acceptability
4 and feasibility of mobile delivery models were identified.
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7 **Overall perceptions of SDMs by AGYW**

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9 In a study conducted in Malawi, Maseko et al found high levels of hypothetical PrEP
10 acceptability among AGYW who reported that interest in PrEP depends on confidential access
11 and discrete packaging (cartons or bottles that resemble treatment for common ailments) of
12 the drug. Moreover, AGYW reported that youth-friendly delivery modalities such as schools
13 and youth-friendly sections of health centres that provide “...a place for the youths to be
14 comfortable getting these drugs...” may facilitate the initiation of PrEP as a prevention
15 strategy.³⁹
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20 **PrEP SDMs for men**

21 We found one mixed method study among young South African men. PrEP was not provided,
22 but hypothetical perceptions, barriers and enablers of PrEP initiation were assessed. Whilst
23 only 11% of men were aware of PrEP, 62% reported that they were very likely to take it. The
24 young men preferred to keep PrEP use a secret from their partners, friends, and family. PrEP
25 initiation was also dependent on the SDM used. Receiving PrEP from the clinic was reported
26 as a barrier to PrEP usage as this could incite community stigma. Young men reported that
27 “...they (community) would immediately think that you are HIV positive already, not that you
28 are taking the prevention one...”
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34 **PrEP SDMs for AGYW and men**

35 We found 19 studies that assessed various SDMs for linkages to PrEP for AGYW and men.
36 Amongst AGYW and men, PrEP SDMs included hybrid (research site-healthcare facility or
37 community-healthcare facility, $n=8$), community ($n=5$) and research site ($n=6$). These studies
38 either recruited serodiscordant couples or included AGYW and men as individual participants.
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43 Hybrid

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45 We identified seven studies that used a hybrid model to deliver PrEP.⁴⁰⁻⁴⁶
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48 One study from Kenya and Uganda by Heffron et al. involved a hybrid (research site- health
49 facility) model that integrated PrEP delivery into antiretroviral therapy (ART) treatment
50 services for high-risk HIV serodiscordant couples.⁴⁰ The intervention was mainly couples-
51 based and involved HIV prevention counselling; safer conception counselling or
52 contraceptives; counselling and HIV testing for HIV-negative partner; PrEP
53 initiation/prescription; and referral to a local health facility for the HIV infected partner for
54 ART. The results showed high uptake of integrated PrEP and ART with an estimated 96%
55 reduction in HIV incidence (82.9% of couples used PrEP or ART and there were no HIV
56 seroconversions, 14.5% used some ART and/or PrEP and 2.6% used neither PrEP nor ART).⁴⁰
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3 Qualitative evidence that explored HIV serodiscordant couple's decision-making and
4 motivations to initiate PrEP through this integrated ART-PrEP approach showed that a positive
5 clinical encounter with a healthcare provider and client-friendly services played a critical role
6 in the couple's decisions to initiate and continue PrEP.⁴⁵ Clear messaging, in-depth
7 counselling and friendly, non-judgmental/stigmatizing services provided by healthcare
8 workers empowered, reassured and promoted PrEP initiation among HIV serodiscordant
9 couples with some describing it as *"service beyond the medicine"*.⁴⁵ Furthermore, being at a
10 place where service is offered to both couple (ART for the HIV positive partner and PrEP for
11 the HIV-negative partner) motivated their decision.⁴⁵
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17 Five studies used a hybrid mobile testing approach implemented at community health fairs,
18 home, or local health facility.^{26 41-44} Two studies from Kenya and Uganda showed that PrEP
19 initiation was high (>75%) among individuals who received HIV testing on the same-day.^{41 43}
20 Mayer et al. found that 39% of participants initiated PrEP within 4 weeks of the community
21 health campaign.⁴² However, the distance between the participants and the healthcare
22 provider influenced PrEP initiation.
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27 Koss et al. and Camlin et al. who explored barriers influencing PrEP initiation using the hybrid
28 (community-health facility) model,^{26 44} found that PrEP initiation was hindered by HIV/ART-
29 related stigma which emanated from the colour of the pill being the same as HIV treatment
30 regimens, and access of PrEP services at the same facility where HIV care is provided.⁴⁴ Men
31 reported that the *"... majority of us fear to go to the health center..."* and suggested
32 alternatives such as designating a clinic day for PrEP or *"...distribute [PrEP] to the people..."*.
33 Participants reported that healthcare workers should deliver PrEP or find delivery methods
34 that are easily accessible by the community *"...just like they did with condoms."* Young adults
35 who attended school outside the community could not initiate PrEP given that PrEP was only
36 provided within study communities. Furthermore, school attendance made initiating and
37 continuing PrEP challenging.^{26 44}
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44 Community

45 Two South African studies conducted in a community setting explored the hypothetical
46 opinions of PrEP among salon owners, stylists, and clients.^{47 48} Ninety-five percent of owners
47 and stylists and 77% of clients were comfortable with PrEP being offered at hair salons,⁴⁸
48 which provide a geographically convenient and conducive environment for receiving health
49 services.^{47 48} A third community-based study which used a 90-second PrEP demand creation
50 video and informational brochures, found that 68% and 56% of young women respectively
51 reported that they were definitely interested in learning more about and initiating PrEP. The
52 study also found that young women preferred realistic visuals that they could identify with,
53 rather than highly stylized models. Data evaluated by Lubwama et al. showed that 69.2% of
54 key populations which included AGYW and serodiscordant couples were reached through
55 drop-in centres and community-based outreach centres providing PrEP versus fixed public
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3 health facilities.⁴⁹ The proportion that returned for PrEP was higher among serodiscordant
4 couples (3 months: 56.9%, 6 months: 46.8%) compared to sex workers (3 months: 37.5%, 6
5 months: 26.3%).
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8 9 Clinical Research Site

10 In three of the six studies conducted at a clinical research site,^{27 40 50-54} PrEP was integrated
11 with ART or with ART and other interventions such as VMMC.^{40 51 52} Across the three studies,
12 $\geq 95\%$ of the HIV-negative partner within serodiscordant couples initiated PrEP. The use of
13 PrEP in combination with ART or other prevention interventions (VMMC) or conception
14 strategies resulted in reduced HIV incidence. Serodiscordant couples found that the “couples-
15 focused” services provided through the integrated PrEP-ART strategy strengthened their
16 relationships. Serodiscordant couples found that the “couples-
17 focused” services provided through the integrated PrEP-ART strategy strengthened their
18 relationships.
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20 21 **Overall perceptions of SDMs by AGYW and men**

22 Several studies explored factors that influence PrEP initiation, non-initiation and
23 discontinuation in individuals who received PrEP through the different SDMs.^{26 27 44-46 54}
24 Motivators to initiate PrEP included: perception of high-risk, preference of PrEP over other
25 HIV prevention methods, protection from unwanted/forced sexual encounters, love for one's
26 partner, knowledge about PrEP and the belief it is effective, partner support belief that PrEP
27 supported life goals and a positive clinical encounter.^{26 27 44-46 54 55} Females preferred a product
28 that was delivered at a health clinic over accessing it at a pharmacy.⁵⁶ Barriers to PrEP
29 initiation included daily pill burden, side effects, mixed dosing messaging, living with parents
30 or attending school, partners consent or partners reaction to use and HIV-related stigma.^{26 27}
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38 39 **Other models**

40 We identified four other studies that explored other methods of promoting PrEP initiation
41 among AGYW and men.⁵⁷⁻⁶⁰ Jani et al. explored male partners support for hypothetical PrEP
42 use by AGYW.⁵⁹ Male partners highlighted that their support would be contingent on their
43 early involvement in the decision-making process regarding PrEP which would alleviate
44 suspicion of infidelity. AGYW suggested that not including male partners may result in social
45 harms (partner violence, dissolution of relationships). Strategies recommended by male
46 partners included couples counselling, educating, and providing PrEP to men and community
47 sensitization. Makyao et al. explored parental support of AGYW's hypothetical use of PrEP.
48 Parents supported PrEP availability acknowledging the risks faced by AGYW.⁶⁰ However,
49 support was also influenced by social norms (promoting promiscuity or condoning sexual
50 activity). Differential parenting roles influenced the type of support: mothers suggested
51 providing a conducive environment (good diet) for PrEP use whilst fathers suggested
52 providing operational support (transport money). Cremin et al. and Irungu et al. reported that
53 providing time-limited PrEP during periods of increased exposure would be a novel, efficient
54 and cost-effective strategy for providing PrEP.^{57 58}
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Discussion

The purpose of this review was to synthesize and appraise the effects on PrEP initiation and the acceptability and feasibility of PrEP SDMs designed to promote linkage to care among AGYW and men eligible for PrEP in SSA. Given the challenging interactions between AGYW and men and the health system, we reviewed evidence of PrEP initiation in a range of SDMs i.e., health facility-, mobile-, community- based or hybrid models, and we explored the perceptions, barriers, and facilitators of these models. This scoping review identified 27 primary studies and 10 conference abstracts.

Delivery of PrEP to AGYW included HF-B models which integrated PrEP into routine FP/MCH/SRH/ANC services, hybrid models which allowed AGYW to initiate PrEP either at community-based venues or private or public facilities and mobile models. Whereas integrated models provided at a public health facility offer a potential “one-stop” location for AGYW to initiate PrEP whilst accessing other services, the additional time spent on PrEP-related activities may deter AGYW from initiation. Roche et al found in a study on integrated PrEP-FP service delivery that youth-friendly clinics are “low-hanging fruit” for PrEP delivery. The youth friendly approach and clinic flow implemented at one of the clinics required less room-to-room movement thus making PrEP delivery to AGYW easier. The second clinic which offered PrEP like any other outpatient service, with clients receiving HIV testing services at HTS points, PrEP counselling and clinical review in consultation rooms, and prescription dispensing at the pharmacy was not favoured by AGYW who did not want to queue at each service point and discuss their sexual activity in crowded FP consultation rooms.⁶¹ Integrated delivery of PrEP provides an opportunity to respond to potential syndemics in AGYW who are eligible for PrEP; however, we found mixed results regarding the effectiveness of integrated models on PrEP initiation. Two studies in which PrEP was initiated in an FP or MCH clinic showed PrEP initiation of <50% with initiation being higher in women >24 years.^{31 32} A third multi-country study which integrated PrEP with SRHS at FP clinics showed 90% PrEP initiation.³⁰ These studies were primarily implementation studies without a comparator, and PrEP related activities were provided by a PrEP-dedicated nurse. This task-shifting strategy removed this additional service from the workload of already overburdened routine nurses; however, the feasibility of this approach requires further evaluation considering the human resources challenges in SSA. Integration of HIV services and other health services has shown to be a useful strategy to improve linkage to HIV care, ART initiation and viral suppression. The most common forms of integration were (i) HIV testing and counselling added to non-HIV services and (ii) non-HIV services added to antiretroviral therapy (ART). The most commonly integrated non-HIV services were maternal and child healthcare, tuberculosis testing and treatment, primary healthcare, family planning, and sexual and reproductive health services.⁶² Innovative adaptations are needed at public primary health facility level to overcome PrEP delivery challenges and barriers that are faced by users and staff. Irungu et al reported adaptations within integrated models such as fast tracking PrEP users to minimise

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3 waiting times and clinicians dispensing PrEP from clinical rooms which removed waiting times
4 at the pharmacy and mitigated any stigma associated with being seen at a pharmacy that
5 mainly dispenses ART.⁶³
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9 Adolescent-friendly clinics or adolescent-friendly sections within health facilities were also
10 shown to promote initiation of PrEP.^{29 30 39} However, a New York study of adolescents' PrEP
11 awareness showed that 86% of adolescents eligible for PrEP reported never being informed
12 about PrEP by their healthcare professionals.⁶⁴ Taggart et al. found that provider attitudes
13 and recommendations within a healthcare facility influence adolescents' willingness or
14 unwillingness to use PrEP.⁶⁵ Our results show that AGYW favour community-based youth-
15 friendly delivery modalities of PrEP such as DICEs or schools over delivery via public and
16 private health facilities. These findings concur with other studies which have shown that
17 factors that influence US women's decision-making about the use of PrEP include the ease of
18 accessing services and medication close to their homes.^{66 67} Moreover, women highlighted
19 the importance of community peers in influencing their decisions to initiate PrEP.⁶⁷
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26 We identified only one study among young, heterosexual men that explored the hypothetical
27 perceptions of PrEP initiation. Men reported that if PrEP was available, they would use it.
28 However, initiation was dependent on SDM and a HF-B model was not favoured due to
29 community stigma.²⁵ Heterosexual men are not classified as a key or vulnerable population in
30 the HIV prevention response, as such research that focuses on PrEP initiation or SDMs among
31 heterosexual men is limited. Increasing the engagement of men with health services requires
32 an understanding of the structural barriers that limit their access and requires targeted and
33 adaptive interventions to meet the needs of men. Differentiated service delivery models (for
34 example facility-based and/or community-based adherence clubs and quick pharmacy pick-
35 up) has been shown to improve uptake and retention of men in HIV treatment services.⁶⁸
36 Gender-transformative interventions such as "One Man Can", a rights-based gender equality
37 and health programme intervention, and Decentralized Medication Delivery (DMD) have also
38 shown success in reducing masculinity-related barriers to engaging in HIV prevention
39 services.⁶⁹ A recent study conducted in South Africa revealed that these differentiated service
40 delivery models have the potential to increase adherence to medication among men in
41 particular.⁷⁰ Other interventions/ models designed to help South African men initiate ART and
42 remain in care such as the MINA and Coach Mpilo campaigns, which provide men with
43 information and support that help them to get tested for HIV, to initiate and remain in care,
44 could also be used to promote PrEP initiation among men.^{71 72}
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52 In studies that targeted both women (including AGYW) and men, SDMs included a hybrid
53 approach (research site-community or community-health facility), community-based models
54 and those based at research sites. PrEP delivery to serodiscordant couples involved integrated
55 models such as delivery of PrEP and ART to serodiscordant couples allows both partners to
56 interact with the health system. In such models, PrEP is initiated and continued only until the
57 HIV infected partner achieves viral suppression which may be a cost-effective approach if viral
58 suppression is achieved timeously.⁴⁰ However, in a sub-Saharan setting where <65% of people
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3 living with HIV have suppressed viral load (VL) (<1000 copies/mL) and there are health
4 systems challenges with VL testing and turn-around-time, integrated delivery of PrEP and ART
5 may not be feasible.^{1 73} Our findings have shown that community-based models which involve
6 same-day HIV testing and PrEP initiation are favourable especially among men.⁴³
7 Furthermore, the delivery of PrEP through innovative community-based venues such as hair
8 salons which provided a comfortable and familiar environment yielded high interest in PrEP
9 initiation.⁴⁷ Many participants reported the convenience of pharmacies located close to public
10 transport routes, as many did not have access to cars or did not want to bear the cost of fuel
11 incurred travelling to the clinic.⁷⁴
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16 Both AGYW, men and serodiscordant couples have expressed that PrEP initiation is influenced
17 by the setting i.e., a friendly environment and by the attitude of healthcare workers i.e., non-
18 judgmental/non-stigmatizing.^{30 45} This suggests that the successful delivery of PrEP to AGYW
19 or men using HF-B models either through integrated or standalone approaches requires
20 healthcare workers to play an essential role.^{75 76} Structural barriers to PrEP initiation included:
21 the distance to travel to and time spent at health facilities. To address these barriers, there
22 is an increasing need for differentiated SDMs that provide alternative access options
23 especially considering that PrEP is a prevention intervention delivered to individuals who are
24 generally of good health and who may be disinclined to travel long distances and wait in long
25 queues to access PrEP.⁷⁷
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31 *Policy and programme recommendations and future research areas*

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33 Notably, literature on PrEP SDMs for AGYW and more especially heterosexual men is limited
34 thus calling for more research in these areas. In order to increase PrEP initiation, country
35 programme implementers need to understand which SDM/s work for AGYW or men and to
36 adapt these to best suit the unique needs of the users.⁷⁸ Opportunities exist for integrated
37 strategies of PrEP delivery at a health facility or mobile clinic. However, we need to
38 understand which integrated strategy (e.g., integration with ART, SRHS, or contraceptive
39 services) is most acceptable and scalable for AGYW and men. Further research is needed
40 among couples where one partner is on PrEP, to understand if the perception of risk changes
41 in the partner who is not on PrEP. We identified only one conference abstract that targeted
42 PrEP SDM among heterosexual men. This study was also limited as PrEP was not provided,
43 but hypothetical perceptions of PrEP were assessed. This dearth of published literature
44 highlights a major gap in the knowledge with considerably more research needed to
45 investigate SDMs among men. Training and retraining of healthcare workers on PrEP
46 guidelines is essential to equip them with the skills to ensure that PrEP is delivered in a friendly
47 and safe space by non-stigmatizing healthcare workers. To mitigate the time burden and
48 travel expenses incurred by AGYW and men, same-day initiation of PrEP to those eligible and
49 multi-months dispensing of refills should be considered.^{11 77 79}
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56 Furthermore, task-shifting among healthcare workers along the PrEP cascade will avoid
57 additional burden on the health system. Further studies are required to evaluate the
58 feasibility of PrEP-dedicated nurses. Differentiated SDMs are needed to take PrEP to where
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3 users live, socialise and work.¹¹ These models include home deliveries, pharmacies, DICEs,
4 salons, mobile clinics and tele-medicine-assisted models in both the public and private health
5 sectors. Mobile clinics near schools could be successful but need to be regular, reliable, and
6 sustainable. Furthermore, considering that eligibility for continuation on PrEP requires repeat
7 HIV testing, there is a need for interventions (e.g., HIV self-testing) to address this challenge
8 when PrEP is delivered at non- HF-B settings.
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11 12 **Strengths and limitations**

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14 The strengths of this review include the inclusion of multiple databases across disciplines and
15 broad inclusion criteria. We also used a comprehensive search strategy that followed the JBI
16 reviewer's manual and structured using PRISMA-ScR guidelines, and robust methods that
17 included double data screening, extraction, and review. Another strength is that we included
18 grey literature and unpublished reports which minimizes the chances of missing studies with
19 negative or null findings.
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24 Limitations include the exclusion of studies conducted in non-SSA and that were published in
25 non-English languages. In addition, due to a lag in adding and indexing articles in various
26 online databases, our review could fail to locate the most recent publications and research
27 on SDMs for PrEP initiation. Another limitation was that most of the included studies were
28 from three countries (Kenya, Uganda, and South Africa) hence the generalisability of the
29 results to SSA might be limited. Furthermore, there were limitations in the sources of
30 evidence as many of the studies evaluated the hypothetical perceptions of PrEP initiation and
31 some of the feasibility and acceptability is theoretical which may not translate to actual
32 realities. Additionally, sub analyses specifically for heterosexual men could not be done since
33 results from some of the studies were not disaggregated by gender. Also, the extraction
34 focuses on synthesizing the setting where PrEP is offered, which is only one component of the
35 SDM and does not focus on other components such as the strategies or individuals providing
36 PrEP. Due to the dearth of literature on SDMs among AGYW and men and considering that
37 PrEP roll out in this population in many SSA countries has only recently been maximised, we
38 included research studies to understand the SDMs in this setting. Although the recruitment
39 criteria in a research setting may have resulted in a higher initiation of PrEP, the lessons learnt
40 from this setting could contribute to improving the roll out of PrEP in AGYW and men. Critical
41 appraisal of evidence from conference abstracts was limited by the information provided in
42 the abstract. As such, many items for conference abstracts on the CASP tool were adjudicated
43 as can't tell or unclear risk.
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52 53 **Conclusions**

54 We conducted a scoping review on PrEP SDMs, summarising evidence on PrEP initiation using
55 existing models among AGYW and men and explored the users' perceptions, and barriers and
56 facilitators of these PrEP models. These models were mostly found to be hybrid approaches
57 (research site-health facility or community-health facility), community-based or based at a
58 research site. Community-based models at convenient locations were favoured by AGYW.
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3 Integrated strategies delivered at friendly health facilities by non-stigmatising healthcare
4 providers was also a preferred PrEP delivery channel. The successful initiation of PrEP by
5 AGYW and men will be dependent on the service setting where it is offered and cannot be
6 considered as a one size fits all approach. Care must be taken to find the delivery method best
7 suited to each sub-population. Future research should focus on what differentiated SDMs
8 work for AGYW and heterosexual men to identify which approach is most successful in
9 improving PrEP initiation and to understand their individual needs when using these models.
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15
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22 **Disclaimer**

23
24 The findings and conclusions in this manuscript are those of the authors and do not
25 necessarily represent the official position of the US Centers for Disease Control and
26 Prevention.
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30 **Author Contributions:**

31
32 All authors contributed to conceptualising and designing the study. TR and WC conducted the
33 literature search. WC, TR, KJ, NJ, DG independently performed screening. WC, TR, CM, EN, ET,
34 MH, TMA, NJ, DG, BZ, WB and FM independently performed data extraction. EN developed
35 the data charting form on REDCap. TR and WC performed initial data synthesis and
36 interpretation and all authors refined it. WC and TR drafted the manuscript. All authors
37 contributed to writing and reviewing the manuscript.
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42 **Competing Interests:** None declared

43
44 **Patient consent for publication:** Not required

45
46 **Data availability statement:** All data relevant to the study are included in the article or
47 uploaded as supplementary information.
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50 **Ethics Approval:** The scoping review focuses on published research in the public domain
51 therefore no ethics approval is required.
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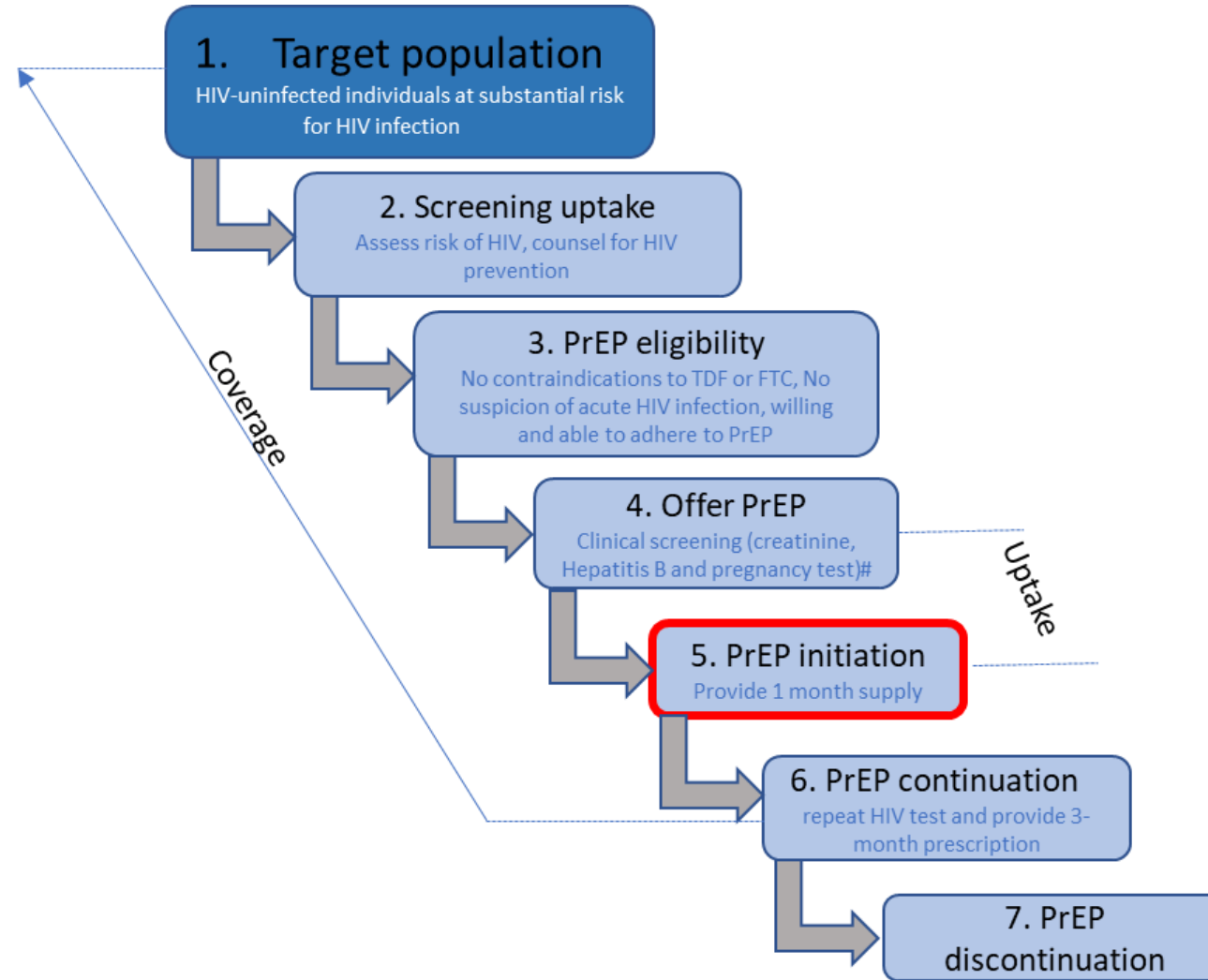
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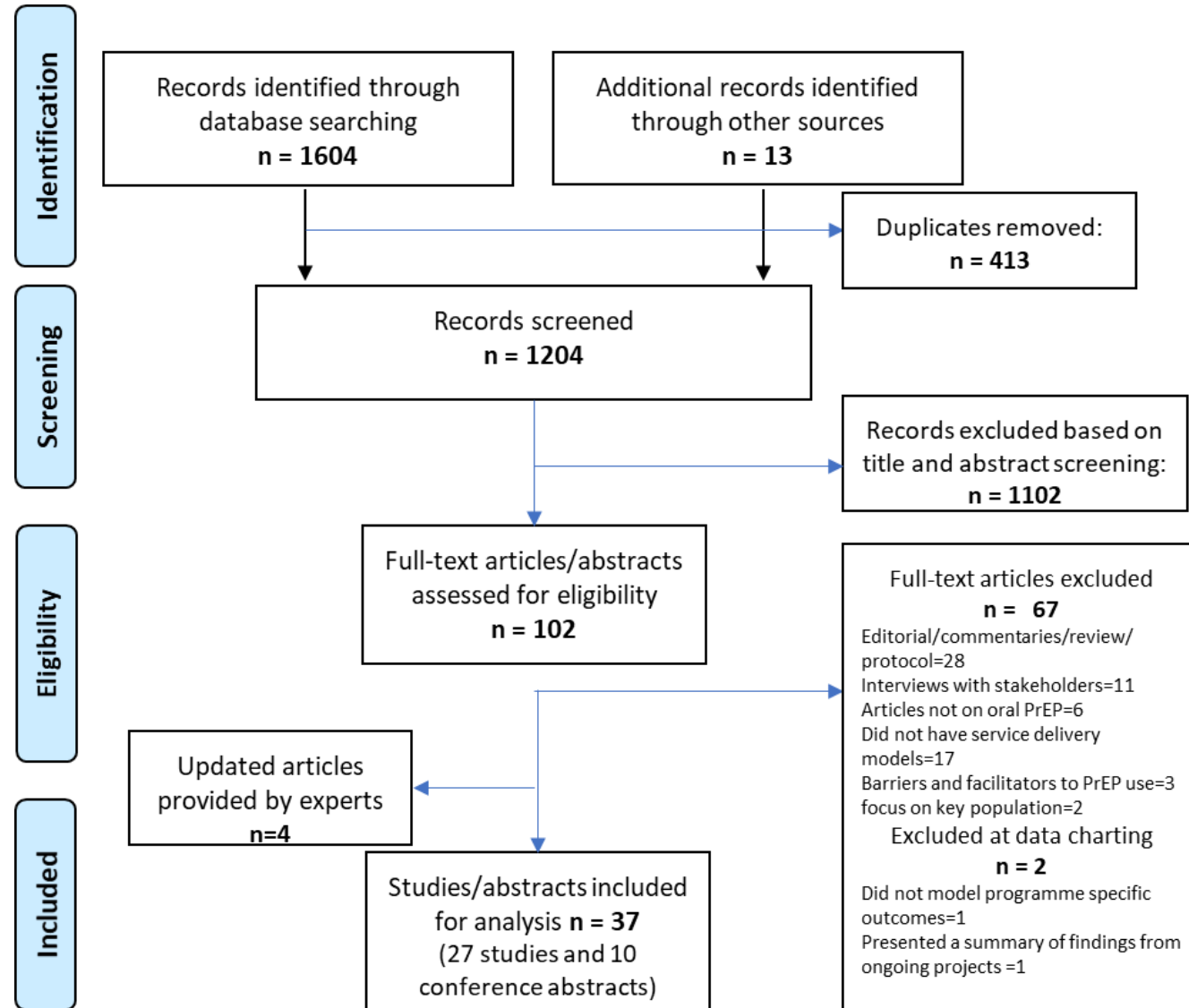
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SET		SEARCH TERMS
1	1 HIV	HIV-1
2		HIV
3		Hiv
4		Set 1- 3 will be combined with "or"
5	2 Pre-exposure Prophylaxis	PRE-EXPOSURE PROPHYLAXIS
6		Pre-Exposure Prophylaxis
7		PrEP
8		Set 5-7 will be combined with "or"
9		Set 4 and 8 will be combined with "and"
10	3 Linkage to care	service provision
11		service delivery
12		SDMs
13		IMPLEMENTATION SCIENCE
14		model
15		models of care
16		differentiated care
17		linkage
18		linkage to care
19		intervention
20		Set 10-19 will be combined with "or"
21		Set 4, 9 and 20 will be combined with "and"
22	4 Country	DEVELOPING COUNTRY
23		Sub-Saharan
24		AFRICA SOUTH OF THE SAHARA
25		AFRICA
26		<i>All sub-Saharan countries included as MeSH and text term combined with or</i>
27		Set 22-26 will be combined with "or"
28		Set 4, 9, 20 and 27 will be combined with "and"

Service Delivery Modality	Author (Year) and study setting	Publication type and objectives	Study population and Sample	Intervention description	Detailed Description of Findings
Studies among AGYW					
Health facility^a	Maseko et al. (2020) ³⁹ Malawi	Research article To understand knowledge of, interest in, concerns about, and delivery preferences for PrEP among AGYW enrolled in the Girl Power study.	Study population: Never been offered to use PrEP services (hypothetical opinions related to PrEP) Sample Sample size (total – N): 40 Gender distribution: Female: 100% Age distribution: 15-19yrs: 21; 20-24yrs: 19	Nature of Intervention: Four models of service-delivery were compared in four separate clinics: Model 1) standard of care (SoC), Model 2) Integrated youth-friendly health services; Model 3) Model 2 plus a small-group behavioural intervention on; and Model 4) Model 3 plus a cash transfer (\$5.50/month). An explanation of PrEP was provided to 40 participants prior to IDI Intervention components: HIV testing, syndromic management of STIs, family planning, and condom distribution. NB: PrEP was not provided in this study, nor was it available in government clinics at the time of the study.	<ul style="list-style-type: none"> • Interest in PrEP based on a belief that their HIV risk exposure was due to factors that were out of their control, including partners having concurrent relationships, challenges with condom negotiation/use, and rape. • Disinterest in PrEP included: perception of low risk because of abstinence or having a single partner, use of PrEP implying infidelity among married AGYW, taking pills daily implying HIV infection. • Interest in initiating PrEP depends upon: <ul style="list-style-type: none"> - ease of accessing PrEP (confidential), - packaging attributes (discrete, cartons, packets, or bottles that would give the appearance of medications for common ailments preferred - delivery context (available in locations frequented by youth such as schools or youth friendly spaces because of ease of access and comfort in the absence of adult patients and family members).

<p>Health facility^b</p>	<p>Mugwanya et al. (2019)³¹</p> <p>Kenya</p>	<p>Research article</p> <p>To demonstrate the feasibility of integrating PrEP delivery within routine family planning clinics to reach at-risk AGYW for PrEP in HIV high burden settings.</p>	<p>Study population: Offered to use PrEP services</p> <p>Sample <i>Sample size (total – N):</i> 1271 <i>Gender distribution:</i> Female: 100% <i>Age distribution:</i> Median: 25 (22-29) <20: 105 20-24: 522 25-29: 356 30-34: 172 ≥35: 116</p>	<p>Nature of Intervention: PrEP-dedicated nurse-led integrated delivery of PrEP in family planning clinics</p> <p>Intervention components: Newly hired nurses were trained on HIV risk assessment, counselling, and PrEP provision. These nurses performed only these duties at the FP clinic. Women attending FP clinics completed other services were then referred to the PrEP-dedicated nurse. This nurse counselled and assessed willingness to consider PrEP (guided by a national guidelines and HIV risk assessment screening tool). Interested and medically eligible women were provided same-day PrEP initiation.</p>	<ul style="list-style-type: none"> • Of 1,271 women screened, 22% initiated PrEP, and 41% returned for at least one refill. • PrEP uptake was independently associated with reported male-partner HIV status ($p < 0.001$) and marital status ($p = 0.04$). • More women >24 years (26%) initiated PrEP compared to young women <24 years (16%). • For women >24 years, the likelihood of initiating PrEP increased by about 3% for each additional year of a woman's age ($p < 0.001$). • FP clinics can be an effective platform to efficiently reach HIV at-risk women who may benefit from PrEP. • Integration of PrEP delivery in FP clinics, makes this a potential "one-stop" location for FP and PrEP. • Although FP visits are busy, efficient implementation strategies such as less frequent PrEP visits and expanding the pool of providers who might be able to screen and provide PrEP beyond the few clinicians and nurses (e.g., training and empowering HIV testing counsellors and community health workers or peer educators) can be built into existing routine services.
<p>Health facility^b</p>	<p>Pintye et al. (2018)³³</p> <p>Kenya</p>	<p>Research article</p> <p>To define approaches for integrating PrEP into routine</p>	<p>Study population: Offered to use PrEP services</p> <p>Sample</p>	<p>Nature of Intervention: Nurse-led teams worked with maternal and child health (MCH) staff at 16 public, faith-based, and</p>	<ul style="list-style-type: none"> • Clinics developed two approaches for integrating PrEP delivery within ANC/PNC: 1) co-delivery: ANC/PNC and

		antenatal and post-natal care (ANC/PNC) using PrIYA Program as a case study.	<p>Sample size (total – N): 16 Health facilities; 40 program-supported nurses</p> <p>Gender distribution: Female 100%</p> <p>Age distribution: not described</p>	<p>private facilities to determine optimal clinic flow for PrEP integration into antenatal (ANC) and postnatal (PNC) care. A program-dedicated nurse facilitated integration.</p> <p>Intervention components:</p> <p>All ANC/PNC clients received assessment for behavioural risk (completion of a questionnaire and willingness to consider PrEP, general informational counselling on PrEP depending on the client's awareness and interest in PrEP. Among clients who were willing to initiate PrEP, PrEP counselling also included information on how to use PrEP and adherence as well as medication dispensation.</p>	<p>PrEP services delivered by same MCH nurse or 2) sequential services: PrEP services after ANC/PNC by a PrEP-specialized nurse.</p> <ul style="list-style-type: none"> • 86 ANC/PNC visits were observed. • Clients who initiated PrEP took a median of 18 minutes (IQR 15-26) for PrEP-related activities (risk assessment, PrEP counselling, creatinine testing, dispensation, and documentation) in addition to other routine ANC/PNC activities. • For clients who declined PrEP, an additional 13 minutes (IQR 7-15) was spent on PrEP-related risk assessment and counselling. • PrEP-specific activities took <20 minutes per client, the moderate additional time burden for PrEP initiation in MCH would likely decline with community awareness and innovations such as group/peer counselling or expedited dispensing.
Health facility	Kinuthia et al. (2020) ³² Kenya	<p>Research article</p> <p>We implemented and evaluated a novel programme to provide PrEP in maternal and child health clinics in Kenya</p>	<p>Study population: Offered to use PrEP services</p> <p>Sample</p> <p>Sample size (total – N): 9376 women</p> <p>Gender distribution: Female:100%</p> <p>Age distribution: <24: 5033 Median age: 24 years (IQR: 21-28)</p>	<p>Nature of Intervention:</p> <p>Integration of PrEP into existing structures at 16 maternal and child health clinics (public, faith-based, and private sector) At each facility, they offered sensitisation sessions to introduce the programme, educate facility staff on PrEP, and seek advice on the best way to integrate PrEP delivery at the facility.</p>	<ul style="list-style-type: none"> • PrEP initiation: 2030 (21.7%) women-initiated PrEP: 79.3% women with partners living with HIV, 37.2% with partners of unknown HIV status, and 11.6% women with HIV-negative partners. • 999 (49.2%) women who initiated PrEP were younger than 24 years • Reasons for initiating PrEP: having a partner living with HIV

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				<p>Intervention components: Programme nurses approached all eligible women provided PrEP counselling as part of routine maternal and child health clinic processes. Risk was assessed using a using a risk assessment tool Women who did not know the HIV status of their partners were offered HIV self-testing kits, if they were willing to test with their partners at home. All women (regardless of risk factors) were informed that PrEP was available if they perceived they were at risk for HIV.</p>	<p>or of unknown HIV status and feeling at risk for acquiring HIV. Reasons for declining PrEP: need to consult partner and low perceived HIV risk Factors associated with initiation: being younger than 24 years, having a partner living with HIV or of unknown HIV status, gestational age less than 26 weeks among pregnant women, having experienced intimate partner violence in the previous 6 months, or sharing needles while engaging in injection drug use, diagnosed or treated for an STI, forced to have sex, and had recurrently used PEP.</p> <ul style="list-style-type: none"> • PrEP continuation: 38.7% of 2030 women returned for PrEP refill at least 1 month after initiation • Factors associated with continuation: women with HIV-positive partners. • Reasons for discontinuation: side effects, no longer perceiving HIV risk, and partner known to be HIV-negative. • PrEP refills: 21.7% of women who initiated PrEP at least 3 months before this evaluation returned for PrEP refill. Of these 242 (54.9%) were younger than 24 years and 199 (45.1%) were aged 24 years or older (p=0.05).
Health facility	Pintye et al. (2019) ²⁹ Kenya	Conference abstract To understand motivations for early PrEP discontinuation	Study population: Offered to use PrEP services Sample size (total – N):	Nature of Intervention: The PrIYA Program provides real world evidence on delivering PrEP to AGYW	<ul style="list-style-type: none"> • Interest in initiating PrEP was heavily influenced by one-on-one interactions with a close

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		among AGYW and Adolescents (PrIYA) Program	69 AGYW 69 in-depth interviews: 21 AGYW received, but never used PrEP • 24 discontinued PrEP within 1 month • 24 discontinued PrEP within 3 months Gender distribution: Females: 100% Age distribution: Age (years) 22 (20-23)	seeking routine ANC, PNC and family planning (FP) services within 16 MCH clinics in Kisumu County, Kenya Intervention components: N/A AGYW were identified by program nurses and purposively sampled based on 3 categories	friend, relative, or teacher/professor <ul style="list-style-type: none"> • Early PrEP discontinuation patterns were influenced by side effects (feared or experienced) and important life events AGYW frequently stopped PrEP after childbirth and found it challenging to remember to take PrEP during the complex transition to motherhood • AGYW reported that pre-initiation counselling focused on adherence; many were unaware that they could restart PrEP after stopping • Messaging on stopping/restarting PrEP tailored to life events common among AGYW, such as childbirth and periods away from partners, could promote appropriate PrEP use
Health facility^a	Hill et al (2020) ³⁸ Malawi	Research article To understand the level of interest in PrEP among AGYW at highest HIV risk, and the potential role of perceived risk in motivating PrEP interest.	Study population: Never been offered to use PrEP services (hypothetical opinions related to PrEP) Sample Sample size (total – N): 825 Gender distribution: Female: 100% Age distribution: Median: 20 [18 to 22] (range: 15 to 27)	Nature of Intervention: AGYW rated their potential interest in using PrEP after receiving this explanation: "PrEP is a medicine that can be used to prevent HIV for people who are HIV-negative. To be protected with PrEP, a pill is taken every day. These pills contain some of the same medicine used to treat people who already have HIV. PrEP is not currently available in Malawi." Intervention components: participants were enrolled and followed for one year.	<ul style="list-style-type: none"> • Epidemiologic risk scores were positively associated with PrEP interest, high numbers of AGYW both above and below the high-risk cut-off were very interested in PrEP (68% vs. 63%). • Perceived risk partially explained the relationship between HIV risk and PrEP interest; greater epidemiologic HIV risk was associated with high perceived risk, which was in turn associated with PrEP interest. • Many more high-risk AGYW were interested in PrEP (68%)

				<p>NB: PrEP was not provided in this study, nor was it available in government clinics at the time of the study.</p>	<p>than expressed a high level of perceived HIV risk (26%).</p> <ul style="list-style-type: none"> • High number of participants with risk scores below the high-risk cut-off who both expressed high perceived risk and interest in PrEP suggesting that demand for PrEP among AGYW may not be well aligned with epidemiologic risk
<p>Mobile clinic/health facility^c</p>	<p>Travill et al. (2018)³⁰</p> <p>Kenya and South Africa</p>	<p>Conference abstract</p> <p>To assess PrEP uptake and sexual behaviour in the POWER cohort.</p>	<p>Study population: Offered to use PrEP services</p> <p>Sample <i>Sample size (total – N):</i> 330 <i>Gender distribution:</i> Female: 100% <i>Age distribution:</i> Median age: 20.5 years (IQR:19-22)</p>	<p>Nature of Intervention: PrEP was integrated with reproductive health services at family planning clinics (Kisumu, Kenya), an adolescent and youth-friendly clinic (Johannesburg, South Africa [SA]) and a mobile van for reproductive health services for youth (Cape Town, SA)</p> <p>Intervention components: PrEP for AGYW</p>	<ul style="list-style-type: none"> • PrEP uptake at the initial visit was 90% across all sites. • Two-thirds (68%) did not know their partners' HIV status and only 4% were in a known sero-discordant relationship. • Main reasons for declining PrEP were fears of HIV stigma or partner reactions • AGYW had evidence of high HIV risk using a risk score, indicating that women initiating PrEP would benefit from it. • AGYW had high willingness to initiate PrEP when delivered in these youth-friendly settings.
<p>Hybrid (community-health facility)^c</p>	<p>Ong'wen et al. (2018)²⁸</p> <p>Kenya</p>	<p>Conference abstract</p> <p>To know more about adolescent girls accessing routine PrEP services in the context of national scale-up programs.</p>	<p>Study population: Offered to use PrEP services</p> <p>Sample <i>Sample size (total – N):</i> 1851 <i>Gender distribution:</i> Females: 100% <i>Age distribution:</i> 15-19 years</p>	<p>Nature of Intervention: PrEP integration through drop-in centres (DICEs), public and private clinics</p> <p>Intervention components: The adolescents received either static or outreach services from 93 Jilinde supported clinics</p>	<ul style="list-style-type: none"> • Among 28,268 clients initiating PrEP, 1851 (6.5%) were adolescent girls • DICEs, clinics designed primarily for sex workers, were the preferred PrEP outlet for adolescent girls, with 66% accessing services in DICEs, 25% accessed PrEP services in public clinics and 9% in private clinics. • Entry to PrEP was through peer educators and networks (50%);

					community outreaches (20%); and within health facilities (30%)
					<ul style="list-style-type: none"> • Efforts to make PrEP accessible to AGYW at risk of HIV acquisition should include restructuring the service delivery model
10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35	<p>Mobile clinic^c</p> <p>Rousseau et al. (2019)²⁹</p> <p>South Africa</p>	<p>Conference abstract</p> <p>Hypothesized that contraceptive use was associated with PrEP uptake and continuation in young women accessing sexual and reproductive health services</p>	<p>Study population: Offered to use PrEP services</p> <p>Sample <i>Sample size (total – N):</i> 1096 <i>Gender distribution:</i> Female: 100% <i>Age distribution:</i> 16-25</p>	<p>Nature of Intervention: Contraceptive use associated with PrEP uptake and continuation in AGYW accessing sexual and reproductive health services (SRHS) from a mobile clinic</p> <p>Intervention components: Sexual reproductive health service including HIV testing, contraception (oral, injectable and implant), and PrEP</p>	<ul style="list-style-type: none"> • Among 1096 AGYW who accessed SRHS 31% initiated PrEP on the same day. • AGYW who were using contraception were significantly more likely to initiate PrEP on the same day compared to those who declined PrEP (76% vs 66% on contraception at that visit; p=0.001). • PrEP initiation was also significantly associated with contraception initiation; contraception was initiated by 44% of AGYW on the same day as PrEP initiation compared to 30% contraception starts in AGYW who declined PrEP (p=0.003). • AGYW's contraception use facilitated PrEP initiation and continuation, PrEP initiation also encouraged young women to initiate contraception use supporting the integration of SRHS with the provision of PrEP for AGYW.
36 37 38 39 40 41 42 43 44 45 46 47	<p>Research site</p> <p>Delany-Moretlwe et al. (2018)³⁶</p> <p>South Africa & Tanzania</p>	<p>Conference abstract</p> <p>To evaluate whether empowerment clubs increase PrEP uptake and continuation among AGYW.</p>	<p>Study population: Offered to use PrEP services</p> <p>Sample <i>Sample size (total – N):</i> <i>Gender distribution:</i> Female:100%</p>	<p>Nature of Intervention: Participants were randomised to standard of care (SoC), which included comprehensive sexual and reproductive health care, with counselling and SMS</p>	<ul style="list-style-type: none"> • 431 AGYW enrolled and 213 randomised to clubs • 97% initiated PrEP • PrEP continuation did not vary significantly by study arm (p-value =0.31)

			Age distribution: Not mentioned	reminders for PrEP users, or to empowerment clubs plus SOC. Intervention components: Facilitators-led small group sessions and clinic follow-up visits for sexually active AGYW on PrEP	<ul style="list-style-type: none"> PrEP continuation was 73% at month 1, 61% at month 3 and 34% at month 6. While PrEP uptake was high in this at-risk population, use diminished with time. Empowerment club participation was low and did not enhance PrEP continuation, contrary to experiences in the HIV treatment field.
Research Site	Donnell et al. (2021) ³⁷ South Africa	Research article To assess the effect of on-site access to PrEP on HIV incidence.	Study population: Offered to use PrEP services Sample Sample size (total – N): 2121 Gender distribution: Female:100% Age distribution: 16-35 years; median age: 23 years (IQR 20-27)	Nature of Intervention: On-site PrEP access at nine trial sites provided by research staff Intervention components: Research nurse provided PrEP	<ul style="list-style-type: none"> After on-site PrEP access began 543 (26%) out of 2124 reported PrEP use. HIV incidence was 2.16% after on-site PrEP access, compared with 4.65% before PrEP access (p=0.0085). Future studies of HIV prevention should incorporate PrEP as part of the standard of prevention
Hybrid (community-Health facility)	Were et al (2020) ³⁵ Kenya	Research article To describe the programmatic application of an oral PrEP cascade; to quantify progression across each step of the cascade for female sex workers (FSW), MSM and AGYW and, to identify missed opportunities.	Study population: Offered to use PrEP services Sample Sample size (total – N): 299,798 Gender distribution: FSW: 211,927, MSM: 47,533 MSM and AGYW: 40,338 Age distribution: AGYW: 15-24; FSW >15 years; MSM:>15 years	Nature of Intervention: Scaling up oral PrEP through integration into routine health services in drop-in centres (DICES), public and private health facilities Intervention components: Individuals enter the PrEP pathway through community mobilization. Individuals who are interested in PrEP are referred to facilities providing PrEP, where they undergo HIV testing services. Clients who screen positive for substantial behavioural risk, or who request PrEP, are referred to an	Quantitative: <ul style="list-style-type: none"> Among PrEP-eligible individuals, 2,900 (11%) AGYW, were initiated on PrEP. Of these clients, whereas 55% of AGYW were between 20 and 24 years. Majority (81%) of clients-initiated PrEP through DICES, whereas 14% and 5% were initiated through public and private facilities respectively. PrEP cascade for AGYW aged 15-19 years: HIV- negative (99%), screened (22%), eligible (36%), initiation (95%), month 1 follow-up

			<p>onsite clinician who conducts a clinical assessment and provides PrEP to clients who are eligible and opt-in. Clients are followed-up visit at the same facility one month following initiation and monthly thereafter.</p>	<p>(31%), month 3 follow up (5%)</p> <ul style="list-style-type: none"> • PrEP cascade for AGYW aged 20-24 years: HIV- negative (98%), screened (23%), eligible (34%), initiation (91%), month 1 follow-up (32%), month 3 follow up (5%) • AGYW had higher missed opportunities for screening (78%). Among those screened, a substantially higher proportion of AGYW (65%) were ineligible for PrEP. • Missed opportunities for PrEP initiation was 8% among AGYW. • Majority of AGYW did not persist on PrEP use at month-1 (68%) and month-3 (94%) follow-ups. <p>Qualitative</p> <ul style="list-style-type: none"> • Eligibility for PrEP: Poor rapport between AGYW and providers inhibits disclosure of risk behaviours. Peer mobilization and referral of low-risk individuals coupled with inadequate client education on PrEP. • Initiation of PrEP: Myths and misconceptions about PrEP and low risk perception among FSW, MSM and AGYW. Co-location of both PrEP and HIV services in comprehensive care centres (HIV clinics) resulted in PrEP clients feeling stigmatized as HIV positive.
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					Stigma-related discouragement from peers, family and friends for eligible users. Providers reluctance to prescribe PrEP associated with reluctance to increase provider workload; provider belief that client will not adhere to PrEP. Insensitive referral and access pathways in public and private health facilities.
Studies among Men					
Not specified	Bell et al. (2019) ²⁵ South Africa	Conference abstract To understand perceptions of PrEP, and barriers and enablers of uptake among young South African men.	Study population: Never been offered to use PrEP services (hypothetical opinions related to PrEP) Sample <i>Sample size (total – N):</i> 2077 (Quantitative: 2019; Qualitative: 58) Gender distribution: Male: 100% Age distribution: 20-34	Nature of Intervention: Perceptions of PrEP use and barriers and enablers of uptake. 58 IDIs Intervention components: N/A	<ul style="list-style-type: none"> • Enablers to PrEP use: <ul style="list-style-type: none"> - Maintain an HIV-negative status - Avoid conflict and turmoil that HIV diagnosis would bring - High degree of enthusiasm towards the concept • Barriers to PrEP use: <ul style="list-style-type: none"> - Practical: remembering to take the pill daily, side effects and access to clinics. - Knowledge: Had basic information, confused PrEP with PEP - Psychological: perceived as "only for women" and health seeking behaviour is not the norm for men. - Social: Being seen at clinics by community members, as people will assume that they are HIV positive. - Interpersonal: Keep PrEP use a secret from their partners, friends and family.
Studies among AGYW and Men					

<p>Hybrid (research site-health facility)^e</p>	<p>Heffron et al. (2018)⁵²</p> <p>Kenya and Uganda</p>	<p>Research article</p> <p>To explore fertility intentions, pregnancy, and evaluated the use of PrEP and ART as periconception HIV risk reduction strategies.</p>	<p>Study population: Offered to use PrEP services</p> <p>Sample <i>Sample size (total – N):</i> 1013 <i>Gender distribution:</i> HIV-infected females: 455; HIV-uninfected males: 224; HIV infected males: 110; HIV-uninfected females: 224 <i>Age distribution:</i> HIV-infected females: 26 (22-30); HIV-uninfected males: 30 (26-37); HIV-uninfected females: 29 (24-35); HIV-infected males: 35 (30-42)</p>	<p>Nature of Intervention: The PrEP delivery model integrated PrEP into HIV treatment services. PrEP discontinuation was encouraged once the HIV-infected partner had used ART for at least 6 months (time to achieve HIV viral suppression).</p> <p>Intervention components: Couples-based HIV prevention counselling; safer conception counselling or contraceptives; counselling and HIV testing for HIV-uninfected partner; PrEP initiation/prescription and adherence counselling; referral of HIV infected partner for ART</p>	<ul style="list-style-type: none"> • Uptake and adherence to integrated PrEP and ART strategy was high with an estimated 96% reduction in HIV incidence. • During the 6 months preceding pregnancy, 82.9% of couples used PrEP or ART and there were no HIV seroconversions, 14.5% used some ART and/or PrEP and 2.6% used neither PrEP nor ART. • Among the 81 couples who were using ART only (61 couples with HIV-infected women and 20 with HIV-infected men), 91.2% of the HIV-uninfected partners had discontinued PrEP due to sustained (i.e., [6 months] ART use by their HIV infected partner. • Integrated PrEP and ART was readily used by HIV serodiscordant couples. • Widespread scale-up of safer conception counselling and services is warranted to respond to strong desires for pregnancy among HIV-affected men and women.
<p>Hybrid (research site-health facility)^e</p>	<p>Ngure et al. (2016)⁴⁵</p> <p>Kenya</p>	<p>Research article</p> <p>To gather insights into couples' decision-making, motivations for PrEP uptake, and experiences soon after PrEP initiation.</p>	<p>Study population: Offered to use PrEP services</p> <p>Sample <i>Sample size (total – N):</i> 40 <i>Gender distribution:</i> Female: 20; Male:20 <i>Age distribution:</i> Females: 29.1 (20-43), Males: 36.6 (27-57)</p>	<p>Nature of Intervention: The PrEP delivery model integrated PrEP into HIV treatment services. PrEP discontinuation was encouraged once the HIV-infected partner had used ART for at least 6 months (time to achieve HIV viral suppression).</p>	<ul style="list-style-type: none"> • PrEP offered couples an additional strategy to reduce the risk of HIV transmission, meet their fertility desires, and cope with HIV serodiscordance. • Remaining HIV-negative at follow-up visits reinforced couples' decisions and

				<p>Intervention components: At the time of interview: time since initiating PrEP was 6.3 months and time since initiating ART was 5.6 months</p>	<p>motivated continued adherence to PrEP. Daily PrEP use supported the HIV-infected partners adherence to ART.</p> <ul style="list-style-type: none"> • A positive clinical encounter (provider's advice and client-friendly services) motivated initiation and continuation of PrEP
<p>Hybrid (community-health facility)^d</p>	<p>Koss et al. (2018)⁴¹</p> <p>Kenya and Uganda</p>	<p>Research article</p> <p>To report on "early adopters" of PrEP in the Sustainable East Africa Research in Community Health (SEARCH) study in rural Uganda and Kenya. intervention.</p>	<p>Study population: Offered to use PrEP services</p> <p>Sample</p> <p>Population: AGYW Men</p> <p>Sample size (total – N): 4064</p> <p>Gender distribution: 1934 females 2130 males 48% females 52% males</p> <p>Age distribution:</p>	<p>Nature of Intervention: PrEP education and discussions occurred on arrival at the health campaign, with HIV counsellors and clinicians. During home-based testing, 1 staff member conducted HIV testing and counselling and provided info about PrEP.</p> <p>Intervention components: 1-month community mobilization and sensitization activities on PrEP. PrEP risk score or was administered. Hybrid HIV and multi-disease testing was conducted (health campaigns & home-based) with counselling and health education discussions on PrEP.</p>	<ul style="list-style-type: none"> • Of 21 212 HIV-uninfected adults, 4064 were identified for PrEP (2991 by empiric risk score, 1073 by self-identified risk). • 739 individuals started PrEP within 30 days; 77% on the same day. • Among adults identified by risk score, predictors of early adoption included male sex (adjusted odds ratio 1.53; 95% confidence interval, 1.09-2.15), polygamy (1.92; 1.27-2.90), serodiscordant spouse (3.89; 1.18-12.76), self-perceived HIV risk (1.66; 1.28-2.14), and testing at health campaign versus home (5.24; 3.33-8.26). • Among individuals who self-identified for PrEP, predictors of early adoption included older age (2.30; 1.29-4.08) and serodiscordance (2.61; 1.01-6.76).
<p>Hybrid (community-</p>	<p>Koss et al. (2020)⁴³</p>	<p>Research article</p> <p>To assess PrEP uptake and engagement after population-</p>	<p>Study population: Offered to use PrEP services</p> <p>Sample</p>	<p>Nature of Intervention: Population-level HIV and multi-disease testing using a hybrid mobile testing approach</p>	<ul style="list-style-type: none"> • In 12935 (10% serodifferent partnership, 54% risk score, 36% self-identified risk) people

<p>health facility)^d</p>	<p>Kenya and Uganda</p>	<p>level HIV testing and universal PrEP access to characterise gaps in the PrEP cascade</p>	<p>Sample size (total – N): 12935 (HIV-negative with elevated risk) Gender distribution: Female: 6459; Male: 6476 Age distribution: 15-24: 4800; 25-34: 4712; 35-44: 1927; 45-54: 991; ≥55: 505</p>	<p>at community health fairs, home-based testing or facilities. PrEP initiation at health fairs or at local clinic. Intervention components: <i>Community:</i> community sensitisation, HIV testing, PrEP counselling to HIV- negative people at elevated risk (serodifferent partnership, risk score, or self-identified risk); on-site PrEP start at health fairs or same-day PrEP initiation at local clinics. <i>Home:</i> home-based testing and PrEP counselling, offer of PrEP through local clinics. <i>Local clinic:</i> Patients with HIV were asked to bring their HIV-negative or partners with unknown HIV status to the clinic for HIV testing and the offer of PrEP initiation. <i>Follow up:</i> visits included supportive delivery system with options for visits at clinic, home, or community locations. Follow up visits included: HCT, PrEP refill blood tests and adherence measurements</p>	<p>at elevated risk, 27% initiated PrEP.</p> <ul style="list-style-type: none"> • 82% initiated PrEP on the same day as HIV testing, 50% of whom were men • 19% of AGYW (15-24 years) initiated PrEP • PrEP uptake was lower among individuals aged 15-24 years and mobile individuals. • At week 4, 64% were engaged in the programme, 49% received medication refills, and 40% self-reported adherence. • At week 72, 56% were engaged, 33% received a refill, and 27% self-reported adherence. • Inclusive risk assessment (combining serodifferent partnership, an empirical risk score, and self-identification of HIV risk) was feasible and identified individuals who could benefit from PrEP. • The biggest gap in the PrEP cascade was PrEP uptake, particularly for young and mobile individuals.
<p>Hybrid (community-health facility)^d</p>	<p>Mayer et al. (2019)⁴² Uganda</p>	<p>Research article To estimate the association between distance to clinic and other transportation-related barriers on PrEP uptake and initial clinic visit</p>	<p>Study population: Offered to use PrEP services Sample Sample size (total – N): 701 Gender distribution: Female: 300; Male: 401 Age distribution: 15-24: 339; 25-34: 242;</p>	<p>Nature of Intervention: PrEP was given using a hybrid model and initiation was dependent on participant choice. PrEP could be initiated same day on-site at community health fairs or at local clinic). For those tested at home PrEP was offered within one to six months following the</p>	<ul style="list-style-type: none"> • Of the 701 PrEP-eligible participants, 39% started PrEP within four weeks; of these, 17% were retained at four weeks. • Participants with a distance to clinic of ≥2 km were less likely to start PrEP (p = 0.012) and

			<p>35-44:77; 45-54: 991; ≥45: 43</p>	<p>community campaign through local clinics. Intervention components: Meetings with community stakeholders to sensitise them on PrEP, at community health campaigns (CHCs), eligible HIV-negative participants at elevated risk (serodifferent partnership, risk score, or self-identified risk) were directed to a PrEP education station where they were informed about how PrEP works, interested participants were offered referral to a linkage station to make an appointment at clinic for PrEP enrolment or same-day PrEP start or a clinic appointment at a later date.</p>	<p>less likely to be retained on PrEP once initiated ($p = 0.024$)</p> <ul style="list-style-type: none"> • Eligible participants (from home-based testing) who did not have the option of same-day PrEP initiation were also less likely to initiate PrEP ($p < 0.001$). • Barriers to PrEP use: daily use of PrEP, "low/no risk of getting HIV, transportation-related barriers (clinic is too far away and travel away from home).
<p>Hybrid (community-health facility) ^d</p>	<p>Camlin et al. (2020)⁴⁴ Kenya and Uganda</p>	<p>Research article To explore understandings of PrEP, elucidate factors influential of demand, decisions around PrEP uptake or non-initiation, and adherence and discontinuation in population subgroups at elevated HIV risk.</p>	<p>Study population: Offered to use PrEP services Sample Sample size (total – N): 111 Gender distribution: Females: 65; Males: 46 Age distribution: 15-35, median age: 24 (range 17-35)</p>	<p>Nature of Intervention: Same day PrEP initiation on-site at community health campaigns or at health facilities. 8 FGDs (4 male, 4 female groups) each with 8-12 participants; 13 IDIs with PrEP initiators and 10 IDIs with PrEP decliners Intervention components: As per SEARCH study: Same day initiation of PrEP on-site at community health campaigns or health facilities. Transport to clinics for the PrEP initiation visit. Follow-up visits which occurred at local health facilities, participants' homes, or other community-based</p>	<ul style="list-style-type: none"> • Gendered motivations for PrEP: young men viewed PrEP as a means to safely pursue multiple partners, while young women saw PrEP as a means to control risks in terms of engagement in transactional sex and difficulty in negotiating condom use and partner testing. • Uptake was hindered by HIV/ART-related stigma (colour of pill same as ART, accessing PrEP at the same facility where HIV care was provided), the need for partners permission, distance to facilities, mixed messaging on the dosing of PrEP, taking daily medications, living with

				locations of the participant's choice.	<p>parents or were attending school, moral prohibitions against sex among young people, desire for “proof” of efficacy by peers</p> <ul style="list-style-type: none"> • Uptake was motivated by high perceived HIV risk, and beliefs that PrEP use supported life goals (completing schooling or having a family). • Discontinuation of PrEP was due to dissolution of partnerships/changing risk, unsupportive partners/peers, or early side effects/pill burden.
<p>Hybrid (community-health facility)^d</p>	<p>Koss et al. (2017)²⁶</p> <p>Kenya and Uganda</p>	<p>Conference abstract</p> <p>To evaluate barriers to the uptake of open-label PrEP offered in a population-based context in high HIV prevalence settings.</p>	<p>Study population: Offered to use PrEP services (nested in SEARCH Trial)</p> <p>Sample</p> <p>Population: Men. Women and youth</p> <p>Sample size (total – N): 63 Community members: 40% men; 35% women; 25% youth 42 Clients who did not initiate PrEP: 38% women; 45% at risk for HIV by empiric score</p> <p>Gender distribution: 16-53 years, median age of 28 years</p> <p>Age distribution: 40% men, 35% women, 25% youth</p>	<p>Nature of Intervention: This is a cross sectional study based on SEARCH trial</p> <p>Intervention components: n/a</p> <p>Intervention delivery setting: n/a</p>	<ul style="list-style-type: none"> - In communities that were offered targeted PrEP in this population-based study, multi-level barriers to the uptake of PrEP were identified. - In addition to barriers identified in prior studies of targeted populations, such as aspects of pill-taking, concerns about effectiveness, and partner and household---level influence, concerns about access to PrEP via health facilities or at school, opportunity costs, mobility, and misconceptions about PrEP as barriers to uptake in SEARCH communities. • Strategies are needed to address these barriers, such as community sensitization, expanded provision of information on PrEP, and community---based delivery mechanisms to facilitate access to PrEP.

<p>1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28</p> <p>Hybrid (community-health facility)</p>	<p>Gombe et al. (2020)⁴⁶</p> <p>Zimbabwe</p>	<p>Research article</p> <p>To understand the factors that motivate clients to accept, decline, continue, or discontinue PrEP.</p>	<p>Study population: Offered to use PrEP services</p> <p>Sample <i>Sample size (total – N):</i> 60 <i>Gender distribution:</i> Female: 46; Male: 14 <i>Age distribution:</i> 16-25: 20%; 26-40: 60%; >41: 20%</p>	<p>Nature of Intervention: PrEP was integrated at two family planning clinics. 54 IDIs with PrEP acceptors and 6 IDIs with PrEP decliners</p> <p>Intervention components: HIV testing; screening for PrEP eligibility according to a tool; same day initiation of PrEP (one-month supply); follow-up visit at month 1 (three-month supply)</p>	<ul style="list-style-type: none"> • Motivators to accept PrEP: High HIV risk perception, preference for PrEP over other HIV prevention methods, perceived severity of living with HIV, confidence in PrEP • Barriers to accepting PrEP: fear of pill burden or impact of pills, wanting partners consent or fearing partner reaction to PrEP, feeling satisfied with current method of HIV prevention • Motivators to continue PrEP: focus on original motivation, establishing daily pill routine, accessible PrEP pill storage, planning ahead before travelling out of town, partner or facility support - Barriers to continuing PrEP: being unaccustomed to taking pills, religious issues, travel out of town, clinic schedule/hours, lack of transport funds, misunderstanding dosing guidance, side effects
<p>29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47</p> <p>Health facility</p>	<p>Sack et al (2020)⁵⁵</p> <p>Mozambique</p>	<p>Research article</p> <p>To explore the perspectives, attitudes, and experiences of HIV serodiscordant partners taking PrEP and develop a messaging campaign to improve PrEP uptake in rural Mozambique to reduce HIV transmission among serodiscordant partners.</p>	<p>Study population: Offered to use PrEP services</p> <p>Sample <i>Sample size (total – N):</i> 20 <i>Gender distribution:</i> Female: 11; Male: 9 <i>Age distribution:</i> Median age 35, interquartile range 26.5-37.5). Female: median age 32, interquartile range 25.5-36; male: median age 36, interquartile range 31-38.</p>	<p>Nature of Intervention: Stories will be presented to discordant couples to try to improve PrEP uptake and reduce incident HIV infections.</p> <p>Intervention components: Three oral stories designed to educate, empower, and normalize PrEP use.</p>	<ul style="list-style-type: none"> • Individual factors influencing PrEP uptake and adherence: love for one's partner, knowledge about PrEP and the belief it is effective, fear of HIV and PrEP stigma • Interpersonal factors affecting PrEP uptake: desire to protect family, partner support and relationship strength, Overcoming the fear of stigma

					to seek support from family and friends
Community	Bassett et al. (2018) ⁴⁸ South Africa	Research article To assess the acceptability and feasibility of offering family planning and HIV prevention services at salons.	Study population: Never been offered to use PrEP services (hypothetical opinions related to PrEP) Sample Population: 17 hair salons, 92 stylists, 326 clients Sample size (total – N): Salons (N = 17), Owners (N = 17), Stylists (N = 92), Female clients (N = 326) Gender distribution: 100% of salon clients were female 82% of stylists were female 65% of owners were female Age distribution: Median age (IQR): Salon clients: 28 (IQR 24 to 33); Stylists: 29 (26-32) Owners: 36 (33-43)	Nature of Intervention: n/a Intervention components: n/a Intervention delivery setting: n/a	<ul style="list-style-type: none"> Overall, most owners, stylists, and clients were willing to receive contraception and PrEP from a nurse in hair salons in and around Umlazi Township. Frequent client visits and willingness of stylists to offer health education suggest that a stylist initiated, nurse-supported health intervention could be feasible in the salon setting. Hair salons represent a promising venue for reaching young women in sub-Saharan Africa at risk of unintended pregnancy and HIV infection.
Community	Bassett et al. (2019) ⁴⁷ South Africa	Research article To assess the acceptability of nurse-offered contraceptive and PrEP services at hair salons in Durban, South Africa.	Study population: Never been offered to use PrEP services (hypothetical opinions related to PrEP) Sample Population: Clients of hair salons-Females, mean age 27 years, hair salon owners, hair stylists Sample size (total – N): Clients=42 (all female) Stylists=43 (40 female; 3 male) Salon owners=10 (8 female; 2 male) Gender distribution: Clients: 42 Females Stylists: 40 Females; 3 Males Owners: 8 Females; 2 Males Age distribution: Clients: M=27.1; SD=6.3 Stylists: M=29.6; SD=5.1 Owners: M=40.3; SD; 7.6	Nature of Intervention: n/a Intervention components: n/a Intervention delivery setting: n/a	<ul style="list-style-type: none"> Participants felt that incentives would be beneficial to program enrolment, if not necessary, to garner interest among clients. One client noted that incentives have become an expected part of research Overall, participants liked the idea of receiving personal SMS messages and having WhatsApp groups as adherence supports. Clients preferred SMS messages for direct adherence motivation because they are more private. One client felt that an SMS could also serve as an automated daily reminder for women on PrEP to take their

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					<p>medication. A few participants also noted that SMS would be more accessible than WhatsApp given data constraints.</p> <ul style="list-style-type: none"> • Overall, participants were enthusiastic about the program. Convenience and a conducive environment were noted as facilitators to receiving health services in the hair salon; attention will have to be directed to establishing privacy and program legitimacy. • Hair salons represent an innovative venue for reaching young women at high-risk for unintended pregnancy and HIV infection.
Community	Lubwama et al. (2019) ⁴⁹ Uganda	Conference abstract A review of PrEP data from PEPFAR Data for Transparency Impact Monitoring (DATIM) for July 2017 to June 2018	<p>Study population: Offered to use PrEP services</p> <p>Sample <i>Population:</i> Key populations including sex workers (SW), men who have sex with men (MSM), transgender persons (TG) and other high-risk groups (fisher folk [FF], discordant couples [DC], truckers, adolescent girls and young women [AGYW] and people who inject drugs).</p> <p><i>Sample size (total – N):</i> Initiated PrEP (6 sites) 3,846 PrEP clients (1 community): 1538</p> <p><i>Gender distribution:</i> Not mentioned</p> <p><i>Age distribution:</i> Not mentioned</p>	<p>Intervention components: Drop-in centres (DINCs), Community based outreach centres</p>	<ul style="list-style-type: none"> • 3,846 individuals-initiated PrEP; 2,568 (67.2%) SW, 327 (8.5%) MSM, 15 (0.4%) TG, and 918 (23.8%) other high-risk groups • One community had 1538 PrEP clients: 58.1% SW, 25.4% FF, 7.4% DC and 0.5% MSM. • Return rates for PrEP were higher among DC (3 months:56.9%, 6 months:46.8%) and low among SW (3 months 37.5%, 6 months 26.3%) and FF (3months 16.4%, 6months 14.2%). • The majority (69.2%, 1064/1538) were reached through outreach models versus fixed public health facilities • More SW than other KP and high-risk groups were reached with PrEP. Retention at 3 and 6

					<p>months was low for sex workers and fisherfolk, somewhat higher for discordant couples.</p> <ul style="list-style-type: none"> • Outreach approaches should be scaled up to reach more KP clients with PrEP. Retention strategies should be strengthened, especially for sex workers and fisherfolk, who may be highly mobile.
Community	Morton et al (2020) ⁵³ South Africa	<p>Research article</p> <p>To understand how to effectively create awareness, stimulate interest, and increase uptake of PrEP.</p>	<p>Study population: Never been offered to use PrEP services (hypothetical opinions related to PrEP)</p> <p>Sample Sample size (total – N): 385 Quantitative: 320 Qualitative: 28 key stakeholders; 11 PrEP-naïve young, 10 PrEP-experienced women, five older women living with HIV, four men, seven key informants</p> <p>Gender distribution: Female 100% in household surveys</p> <p>Age distribution: Quantitative: 20 (18, 23) Qualitative: PrEP-naïve young women (aged 16-25), PrEP-experienced women (aged 16-29), older women living with HIV (aged 26-32), men (aged 25-35)</p>	<p>Nature of Intervention: Young women were shown a 90-second PrEP demand creation video and two informational brochures and then asked to self-administer a short survey that included questions on demographics, sexual relationships, risk taking, HIV risk perception, PrEP interest and knowledge, and their opinions about the video..</p> <p>Intervention components: Research staff visited houses up to three times, requesting to speak with the young woman household resident. Young women who agreed to participate were shown the video and then asked to self-administer a short survey.</p>	<p>Quantitative</p> <ul style="list-style-type: none"> • Most reported interest in learning more about PrEP (67.7% 'definitely interested' and 9.4% 'somewhat interested') and taking PrEP (56.4% 'definitely interested' and 12.5% 'somewhat interested'). • Factors significantly associated with interest in taking PrEP were having a primary partner with whom they regularly have sex (80.0% vs. 65.2% without a primary partner; adjusted odds ratio (AOR)=3.1, 95% CI: 1.3, 7.0) and being in a sexual partnership for <6 months (86.8% vs. 68.5% for >12 months; AOR=3.0, 95% CI: 1.2, 7.3).
Research site	Heffron et al. (2018) ⁴⁰ East Africa	<p>Research article</p> <p>To present estimates of effectiveness and patterns of PrEP use within a two-year demonstration project of PrEP for HIV- negative members of heterosexual HIV</p>	<p>Study population: Offered to use PrEP services</p> <p>Sample Population: Serodiscordant couples Sample size (total – N): 1010 couples Gender distribution:</p>	<p>Nature of Intervention: PrEP was offered at enrolment at research site to all HIV-negative participants as PrEP with a daily dosing schedule; participants electing not to initiate PrEP at enrolment were</p>	<ul style="list-style-type: none"> • 97% of HIV-negative partners-initiated PrEP. • Median duration of PrEP use was 12 months (IQR 6-18) • Adherence: 71% of HIV-negative participants took ≥80% of expected doses

		serodiscordant couples in East Africa.	Males: 1010 Females 1010 Age distribution: HIV-: Age, years 30 (26, 36) HIV+: Age, years 28 (23, 35)	offered PrEP initiation at subsequent visits Intervention components: N/A Intervention delivery setting: Research site	<ul style="list-style-type: none"> • 95% reduction (95% CI 86-98%, p<0.0001) in HIV incidence, relative to estimated HIV incidence for the population in the absence of PrEP integrated into HIV treatment services.
Research site^e	Ware et al. (2018) ⁵⁴ Uganda	Research article To evaluate the integrated strategy of delivering PrEP & ART to find out why it was successful.	Study population: Offered to use PrEP services Sample Sample size (total – N): 93 couples Gender distribution: Female HIV-uninfected partner: (46%) Age distribution: HIV uninfected partner: 31 (26 to 37) HIV infected partner 31 (25 to 37)	Nature of Intervention: The integrated strategy offered time-limited PrEP to uninfected partners as a "bridge" to long-term ART in the infected partner. Uninfected partners were offered PrEP at baseline and encouraged to discontinue once infected partners had used ART for six months. Intervention components: PrEP was integrated with ART	<ul style="list-style-type: none"> • Couples viewed in services as hope for staying together, attending joint follow up appointments together increased mutual support, and travelling and waiting room time provided an opportunity for discussion, reflection and joint decision making. • Concern for partner wellbeing was a reason for initiating ART whilst the simultaneous use of ARVs turned management of HIV into a shared experience • Couples devised joint strategies for adhering to PrEP and ART such as mutual reminders and emotional and material support for adherence.
Research site	Atujuna et al. (2018) ²⁷ South Africa	Research article To explore acceptability and preferences for New biomedical prevention technologies (NPTs) among key and other vulnerable populations in two South African townships.	Study population: Never been offered to use PrEP services (hypothetical opinions related to PrEP) Sample Sample size (total – N) Adolescents=14 Gender distribution: Heterosexual women=10 Heterosexual men=9	Nature of Intervention: n/a Intervention components: n/a Intervention delivery setting: n/a	<ul style="list-style-type: none"> • Different product preferences and motivations emerged by population based on similarity to existing practices and contexts of vulnerability. • Adult women and female adolescents preferred a vaginal ring and HIV vaccine, motivated by longer duration of protection to mitigate feared repercussions from male partners, including threats to their marriage and

					<p>safety, and a context of ubiquitous rape.</p> <ul style="list-style-type: none"> • Male adolescents preferred an HIV vaccine, seen as protection in serodiscordant relationships and convenient in obviating the HIV stigma and cost involved in buying condoms. • Adult men preferred PrEP, given familiarity with oral medications and mistrust of injections, seen as enabling serodiscordant couples to have a child.
Research site^e	<p>Baeten et al. (2016)⁵⁰</p> <p>Kenya and Uganda</p>	<p>Research article</p> <p>To understand the delivery feasibility and uptake of, as well as adherence to, an integrated package of ART and PrEP among high-risk heterosexual HIV-1-serodiscordant couples</p>	<p>Study population: Offered to use PrEP services</p> <p>Sample <i>Sample size (total – N)</i> 1013 serodiscordant couples</p> <p>Gender distribution: HIV-1-uninfected partner Male: 679 (67%)</p> <p>Age distribution: HIV-1-uninfected partner Age <25 y=207 (20%), HIV-1-infected partner Age <25 y= 317 (31%)</p>	<p>Nature of Intervention: HIV- partners were offered PrEP which was provided at the study sites, as PrEP was not available otherwise in Kenya and Uganda during the study period. ART was offered at the study site or by referral to another HIV-1 care center of their choice</p> <p>Intervention components:</p> <ul style="list-style-type: none"> - Couples were offered antiretroviral medications - Counselling on HIV-1 prevention benefits <p>PrEP discontinued 6 months after the infected partner initiated antiretroviral treatment</p>	<ul style="list-style-type: none"> • ART was initiated by 789 (78%) HIV-1-infected partners. • 960/1 013 (95%) HIV-uninfected partners-initiated PrEP at enrolment, and 2% initiated PrEP at a later visit. • Among those initiating PrEP at enrolment and attending the month 1 and 3 visits, 840 (97%) and 792 (94%) continued to receive PrEP. • Adherence to PrEP measured by pill counts of returned, unused pills, indicated that 95% of dispensed pills had been taken as expected and 88% of periods between study visits had adherence >80%. • 14 initially HIV-1-seronegative partners seroconverted during follow-up (12 were infected at the time of study enrolment).

<p>Research site</p>	<p>Heffron et al. (2019)⁵¹</p> <p>Kenya</p>	<p>Research article</p> <p>To determine uptake, use and effectiveness of a comprehensive safer conception intervention among HIV-serodiscordant couples with immediate fertility desires.</p>	<p>Study population: Offered to use PrEP services</p> <p>Sample Population: Serodiscordant couples</p> <p>Sample size (total – N): 74</p> <p>Gender distribution: HIV-negative females/HIV positive males= 54%</p>	<p>Nature of Intervention: Couples attended monthly visits at the study clinic prior to pregnancy and quarterly visits during pregnancy. Couples were followed for 12 months or until the end of pregnancy. During all visits, couples received counselling about HIV prevention, information about how to track women's menstrual cycles and identify peak fertility days and how to conduct vaginal self-insemination</p> <p>Intervention components: The intervention package included antiretroviral therapy (ART) for HIV-positive partners, oral pre-exposure prophylaxis (PrEP) for HIV-negative partners, daily fertility and sexual behaviour tracking via short message service (SMS) surveys, counselling on self-insemination, and referrals for voluntary medical male circumcision and fertility care.</p>	<ul style="list-style-type: none"> • Of the 74 enrolled couples, 54% were HIV-negative female/HIV-positive male couples. • Prior to pregnancy, 100% of partners living with HIV used ART and 100% of HIV-negative partners-initiated PrEP. • One-month preceding pregnancy, 80.9% of HIV-positive partners were virally suppressed and 81.4% of HIV-negative partners were highly adherent to PrEP. • 42.6% pregnancies were protected using all four strategies i.e., men were circumcised, high adherence to PrEP, ART and timed condomless sex. • In addition to male circumcision, seven pregnancies (14.9%) were also protected by high adherence to PrEP and ART, 5 (10.6%) were protected by PrEP and timed condomless sex. • 0 HIV seroconversions (95% CI 0.0 to 6.0 per 100-person years) were observed indicating a 100% reduction in HIV risk (p = 0.04).
<p>Research Site</p>	<p>Minnis et al (2020)⁵⁶</p> <p>South Africa</p>	<p>Research article</p> <p>Examined youths' preferences for key attributes of long-acting PrEP, with a focus on characteristics pertinent to product delivery alongside key modifiable product attributes.</p>	<p>Study population: Never been offered to use PrEP services (hypothetical opinions related to PrEP)</p> <p>Sample Sample size (total – N): 807</p> <p>Gender distribution: Female: 401 (50%); Men who have sex with women only (MSW): 216 (27%).</p>	<p>Nature of Intervention: Participants were asked to choose between two hypothetical PrEP products composed of five attributes product form (injection, implant); dosing frequency (two, six or twelve months); where to obtain the product (clinic, pharmacy, community</p>	<ul style="list-style-type: none"> • All three subgroups had strong preference for a product with a one-year duration over two months (p < 0.001). • MSW placed the most importance on dosing frequency, with it being five times more important than any other attribute.

			<p>Men who have sex with men MSM): 190 (23%)</p> <p>Age distribution: Median age (IQR): Female: 21 (19 to 22); men who have sex with women only: 21 (19 to 22) men who have sex with men: 20 (19 to 22)</p>	<p>distribution, mobile clinic - all models for current HIV prevention and contraceptive service delivery); pain involved with injection or insertion (mild, moderate) and delivery location on the body (arm, buttock, thigh).</p> <p>Intervention components: Participants completed interviews on a tablet computer. The survey first introduced each attribute individually with both visual and narrative descriptions. Participants were then presented with nine DCE choice questions, each one a unique choice NB: PrEP was not provided in this study.</p>	<ul style="list-style-type: none"> • Females had greater preference for a single injection over an implant compared to MSW ($p \leq 0.004$). • Females and MSW expressed more preference for two injections compared with implants ($p \leq 0.009$). • Females preferred using a product that was offered at a health clinic over accessing it at a pharmacy ($p < 0.001$). • All youth preferred product insertion in the arm ($p < 0.001$). • Females disliked insertion in the thigh and both MSW and MSM disliked insertion on the buttocks ($p = 0.01$). • Youth indicated strong preferences for longer duration products. <p>Each attribute nonetheless influenced preferences, offering insight into trade-offs that inform long-acting PrEP development.</p>
Other					
Not described	Jani et al. (2018) ⁵⁹ Tanzania	Conference abstract To describe support for PrEP use among male partners of AGYW in Tanzania via a qualitative comparative analysis of AGYW's and male partners of AGYW's views	<p>Study population: Never been offered to use PrEP services (hypothetical opinions related to PrEP)</p> <p>Sample Sample size (total – N): not described Gender distribution: not described Age distribution: not described</p>	<p>Nature of Intervention: Prior to IDIs and FGDs participants were acquainted with PrEP, by sharing a visual, standardized script of PrEP information with them. 24 IDIs and 4 FGDs with AGYW; 16 IDIs with men</p> <p>Intervention components: PrEP for AGYW</p>	<ul style="list-style-type: none"> • AGYW and male partners agreed that most male partners would be willing to support PrEP use by AGYW. • However, male partner support might be contingent on their early involvement in the decision-making process regarding PrEP. • Early inclusion was perceived to remove suspicion of infidelity and alleviate negative consequences associated with

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					<p>late or inadvertent disclosure of PrEP use.</p> <ul style="list-style-type: none"> • AGYW suggested potential social harms (relationship dissolution, loss of financial support, and verbal and physical violence) if male partners are not involved whilst male partners denied such potential extreme consequences. • Male participants recommended strategies on gaining men’s support of PrEP including providing education to men on PrEP, equipping AGYW with skills to educate their partners, couples counselling by providers, provision of PrEP for men, and community education and sensitization. • Educating male partners about PrEP and engaging them in implementation activities should be part of PrEP roll-out strategies for AGYW.
Not described	Makyao et al. (2018) ⁶⁰ Tanzania	Conference abstract To explore how social norms and gendered parenting roles might influence parental support of AGYW's PrEP use.	<p>Study population: Never been offered to use PrEP services (hypothetical opinions related to PrEP)</p> <p>Sample <i>Sample size (total – N):</i> 55 <i>Gender distribution:</i> Female parents: 28; Male parents: 27 <i>Age distribution:</i> not described</p>	<p>Nature of Intervention: Prior to IDIs and FGDs participants were acquainted with PrEP, by sharing a visual, standardized script of PrEP information with them. 4 FGDs with male parents and 4 FGDs with female parents</p> <p>Intervention components: PrEP for AGYW</p>	<ul style="list-style-type: none"> • Parents supported PrEP availability recognizing AGYW's high risk of HIV due to limited power to negotiate preventative behaviours and frequent violence in sexual relationships. • Differential parenting roles influenced the type of support. Men noted shame and embarrassment in communicating with their

					<p>daughters about relationships and sex.</p> <ul style="list-style-type: none"> • Social norms around adolescent sexuality influenced parental support. Parents were wary of being viewed as condoning pre-marital sexual activity, while they worried that AGYW could be stigmatized as promiscuous. • Parents recommended strategies for supporting their daughters PrEP use included: creating a supportive environment for PrEP use (e.g., ensuring good diet) while male parents described offering logistical and material support (e.g., providing transport to health centres).
n/a Modelling	Cremin et al. (2015) ⁵⁷ Mozambique	<p>Research article</p> <p>The aim of this paper is to estimate the prevention impact and the cost effectiveness of providing time-limited PrEP to partners of migrant miners in Gaza, Mozambique.</p>	<p>Study population: Never been offered to use PrEP services (hypothetical opinions related to PrEP)</p> <p>Sample Population: adult heterosexual</p> <p>Sample size (total – N): Note mentioned (modelling)</p> <p>Gender distribution: N/A</p> <p>Age distribution: N/A</p>	<p>Nature of Intervention: n/a</p> <p>Intervention components: n/a</p> <p>Intervention delivery setting: n/a</p>	<ul style="list-style-type: none"> • Providing time-limited PrEP to partners of migrant miners in Gaza Province during periods of increased exposure would be a novel strategy for providing PrEP. This strategy would allow for a better prioritized intervention, with the potential to improve the efficiency of a PrEP intervention considerably, as well as providing important reproductive health benefits
n/a Modelling	Irungu et al. (2019) ⁵⁸ Kenya	<p>Research article</p> <p>To provide estimates of the cost of delivering antiretroviral-based HIV prevention to HIV serodiscordant couples in</p>	<p>Study population: Never been offered to use PrEP services (hypothetical opinions related to PrEP)</p> <p>Sample Population: Heterosexual couples</p> <p>Sample size (total – N): N/A</p>	<p>Nature of Intervention: n/a</p> <p>Intervention components: n/a</p>	<ul style="list-style-type: none"> • Time-limited provision of PrEP to the HIV uninfected partner within HIV serodiscordant couples can be an affordable delivery model implemented in HIV care programs in Kenya and similar settings. These

		public health facilities in Kenya and the incremental cost of providing PrEP as a component of this strategy.	<p>Gender distribution: none provided</p> <p>Age distribution: No age disaggregation</p>		costs can be used for budgetary planning and cost effectiveness analyses.
n/a Modelling ^e	Ngure et al. (2020) ³⁴ Kenya and Uganda	Research article To estimate the associations between effective contraceptive use and 1) PrEP dispensation 2) high effective PrEP use	<p>Study population: Offered to use PrEP services</p> <p>Sample</p> <p>Population:</p> <p>Sample size (total – N): 311</p> <p>Gender distribution: Female: 100%</p> <p>Age distribution: Median age: 29 years ([IQR] 24.0-35.0)</p>	<p>Nature of Intervention: HIV-uninfected women were provided with both PrEP and effective contraception</p> <p>Intervention components: PrEP was integrated with ART</p>	<ul style="list-style-type: none"> • PrEP dispensation was more frequent among those concurrently using effective contraception, (adjusted relative risk [aRR]=1.19; 95% confidence interval [CI]=1.08-1.32) and contraceptive use was more common among those on PrEP (aRR=1.63; 95% CI=1.18-2.25). • Healthcare delivery models that integrate the provision of family planning and PrEP may successfully promote both preventive products, especially long-acting contraception

a. Conducted in the context of the Girl Power study b. Conducted in the context of the PrEP Implementation in Young Women and Adolescents (PriYA) study c. Conducted in the context of the Prevention Option for Women Evaluation Research (POWER) project d. Conducted in the context of the Sustainable East Africa Research in Community Health (SEARCH) study e. Implemented within The Partners Demonstration Project

Author	Item										11
	1	2	3	4	5	6	7	8	9	10	
Qualitative studies using the CASP Tool ²²											
Atujuna et al., 2018 ⁵¹	+	+	+	+	+	+	+	+	+	+	
Bassett et al., 2019 ⁴⁶	+	+	+	?	+	?	+	+	+	+	
Bell et al., 2019 ^{36*}	+	+	+	?	?	-	-	?	-	?	
Camlin et al., 2020 ⁴²	+	+	+	+	+	+	+	+	+	+	
Gombe et al., 2020 ⁴⁴	+	+	?	?	+	+	+	+	+	+	
Jani et al., ⁵⁵	+	+	+	?	?	-	?	?	+	?	
Makyao et al., ⁵⁶	+	+	+	?	?	-	-	?	?	?	
Maseko et al., ²⁵	+	?	-	-	+	?	-	+	?	?	
Ngure et al., 2016 ³⁸	+	+	+	+	+	+	+	+	+	+	
Pintye et al., 2019 ²⁹	+	+	+	?	+	?	?	?	+	+	
Ware et al., 2018 ⁵⁰	+	+	+	+	+	?	+	?	?	?	
Morton et al., 2020 ^{48*}	+	+	+	+	+	-	+	?	+	+	
Were et al., 2020 ^{35*}	+	+	+	+	+	+	+	+	+	+	
Sack et al., 2021 ⁵¹	+	+	+	+	+	+	+	+	+	+	
Comparative studies including randomised trials, nonrandomised trials, interrupted time series and controlled-before after studies using the EPOC tool ²¹											
Delany-Moretlwe et al., 2018 ³⁴	?	?	+	?	?	?	?	?	?		
Koss et al., 2018 ³⁹	-	?	+	+	?	+	+	+	+		
Donnell et al., 2021 ³⁴	?	?	+	+	?	?	?	+	+		
Studies involving descriptions of interventions, implementation or policy processes with very limited empirical data and other non-conventional sources using the WEIRD tool ²³											
Baetan et al., 2016 ⁵²	+	+	+	!	+	N/A	!	+	+	+	+
Bassett et al., 2018 ⁴⁵	+	+	?	+	+	+	?	+	+	+	+
Bell et al., 2019 ^{36*}	!	-	-	?	?	?	?	-	?	-	-
Heffron et al., 2018 ⁴⁹	+	?	!	?	?	+	?	+	+	+	+
Heffron et al., 2018 ³⁷	+	!	!	!	-	!	?	?	?	+	+

Kinuthia et al.,2020 ²⁸	+	+	+	!	?	N/A	!	!	!	+	+
Koss et al., 2020 ⁴⁰	?	?	?	?	?	?	?	?	?	?	?
Koss et al.,2017 ⁴³	-	-	-	-	-	+	?	?	+	?	-
Lubwama et al., 2019 ⁴⁷	-	+	-	?	N/A	!	-	-	?	+	-
Mayer et al.,2019 ⁴¹	+	+	+	+	+	N/A	!	+	+	+	+
Mugwanya et al.,2019 ²⁶	+	+	?	?	!	!	!	!	!	+	!
Ongwen et al.,2019 ³²	!	!	?	!	+	N/A	!	-	!	?	-
Pintye et al.,2018 ²⁷	+	!	!	!	?	?	?	!	!	?	?
Rousseau et al.,2019 ³³	?	?	?	?	?	?	?	?	?	?	?
Travill et al.,2018 ³¹	!	?	?	!	?	?	?	-	-	-	-
Hill et al.,2020 ³⁰	+	+	+	+	+	+	+	+	+	+	+
Morton et al.,2020 ^{48*}	+	+	+	+	+	+	+	+	+	!	+
Minnis et al.,2020 ⁵⁴	+	+	+	+	+	+	+	+	+	+	+
Were et al.,2020 ^{35*}	+	+	+	+	+	+	+	+	+	+	+

+=Yes/Low risk/No or very minor concerns; -=No/High risk/Serious concerns'; ?=Can't tell/Unclear risk/Moderate concerns; !=Minor concerns

*Mixed methods study, Modelling studies were not appraised

Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) Checklist

SECTION	ITEM	PRISMA-ScR CHECKLIST ITEM	REPORTED ON PAGE #
TITLE			
Title	1	Identify the report as a scoping review.	1
ABSTRACT			
Structured summary	2	Provide a structured summary that includes (as applicable): background, objectives, eligibility criteria, sources of evidence, charting methods, results, and conclusions that relate to the review questions and objectives.	2
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of what is already known. Explain why the review questions/objectives lend themselves to a scoping review approach.	3-5
Objectives	4	Provide an explicit statement of the questions and objectives being addressed with reference to their key elements (e.g., population or participants, concepts, and context) or other relevant key elements used to conceptualize the review questions and/or objectives.	5
METHODS			
Protocol and registration	5	Indicate whether a review protocol exists; state if and where it can be accessed (e.g., a Web address); and if available, provide registration information, including the registration number.	6
Eligibility criteria	6	Specify characteristics of the sources of evidence used as eligibility criteria (e.g., years considered, language, and publication status), and provide a rationale.	6-7
Information sources*	7	Describe all information sources in the search (e.g., databases with dates of coverage and contact with authors to identify additional sources), as well as the date the most recent search was executed.	7
Search	8	Present the full electronic search strategy for at least 1 database, including any limits used, such that it could be repeated.	7
Selection of sources of evidence†	9	State the process for selecting sources of evidence (i.e., screening and eligibility) included in the scoping review.	7
Data charting process‡	10	Describe the methods of charting data from the included sources of evidence (e.g., calibrated forms or forms that have been tested by the team before their use, and whether data charting was done independently or in duplicate) and any processes for obtaining and confirming data from investigators.	7
Data items	11	List and define all variables for which data were sought and any assumptions and simplifications made.	7
Critical appraisal of individual sources of evidence§	12	If done, provide a rationale for conducting a critical appraisal of included sources of evidence; describe the methods used and how this information was used in any data synthesis (if appropriate).	7



SECTION	ITEM	PRISMA-ScR CHECKLIST ITEM	REPORTED ON PAGE #
Synthesis of results	13	Describe the methods of handling and summarizing the data that were charted.	8
RESULTS			
Selection of sources of evidence	14	Give numbers of sources of evidence screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally using a flow diagram.	8-9
Characteristics of sources of evidence	15	For each source of evidence, present characteristics for which data were charted and provide the citations.	9-28
Critical appraisal within sources of evidence	16	If done, present data on critical appraisal of included sources of evidence (see item 12).	29
Results of individual sources of evidence	17	For each included source of evidence, present the relevant data that were charted that relate to the review questions and objectives.	29-33
Synthesis of results	18	Summarize and/or present the charting results as they relate to the review questions and objectives.	29-33
DISCUSSION			
Summary of evidence	19	Summarize the main results (including an overview of concepts, themes, and types of evidence available), link to the review questions and objectives, and consider the relevance to key groups.	33-36
Limitations	20	Discuss the limitations of the scoping review process.	36
Conclusions	21	Provide a general interpretation of the results with respect to the review questions and objectives, as well as potential implications and/or next steps.	36
FUNDING			
Funding	22	Describe sources of funding for the included sources of evidence, as well as sources of funding for the scoping review. Describe the role of the funders of the scoping review.	37

JBI = Joanna Briggs Institute; PRISMA-ScR = Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews.

* Where *sources of evidence* (see second footnote) are compiled from, such as bibliographic databases, social media platforms, and Web sites.

† A more inclusive/heterogeneous term used to account for the different types of evidence or data sources (e.g., quantitative and/or qualitative research, expert opinion, and policy documents) that may be eligible in a scoping review as opposed to only studies. This is not to be confused with *information sources* (see first footnote).

‡ The frameworks by Arksey and O'Malley (6) and Levac and colleagues (7) and the JBI guidance (4, 5) refer to the process of data extraction in a scoping review as data charting.

§ The process of systematically examining research evidence to assess its validity, results, and relevance before using it to inform a decision. This term is used for items 12 and 19 instead of "risk of bias" (which is more applicable to systematic reviews of interventions) to include and acknowledge the various sources of evidence that may be used in a scoping review (e.g., quantitative and/or qualitative research, expert opinion, and policy document).

From: Tricco AC, Lillie E, Zarin W, O'Brien KK, Colquhoun H, Levac D, et al. PRISMA Extension for Scoping Reviews (PRISMA-ScR): Checklist and Explanation. *Ann Intern Med.* 2018;169:467–473. doi: [10.7326/M18-0850](https://doi.org/10.7326/M18-0850).



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