MODULE 5

MONITORING AND EVALUATION

WHO IMPLEMENTATION TOOL FOR PRE-EXPOSURE PROPHYLAXIS (PrEP) OF HIV INFECTION

OCTOBER 2018

World Health Organization

WHO Implementation tool for pre-exposure prophylaxis (PrEP) of HIV infection. Module 5: Monitoring and evaluation.

WHO/CDS/HIV/18.10

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Contents

Introduction

Following the WHO recommendation in September 2015 that "oral pre-exposure prophylaxis (PrEP) should be offered as an additional prevention choice for people at substantial risk of HIV infection as part of combination HIV prevention approaches", partners in countries expressed the need for practical advice on how to consider the introduction of PrEP and start implementation. In response, WHO has developed this series of modules to support the implementation of PrEP among a range of populations in different settings.

Although there is growing acknowledgement of PrEP's potential as an additional HIV prevention option, and countries are beginning to consider how PrEP might be most effectively implemented, there has been limited experience with providing PrEP outside research and demonstration projects in low- and middle-income countries. Consequently, there is often uncertainty around many implementation issues. The modules in this tool provide initial suggestions for the introduction and implementation of PrEP based on currently available evidence and experience. However, it is recognized that this evidence may evolve following wider PrEP use; therefore, it is likely that this tool will require regular updating.

PrEP should not replace or compete with effective and well-established HIV prevention interventions, such as comprehensive condom programming for sex workers and men who have sex with men and harm reduction for people who inject drugs. Many people who could benefit most from PrEP belong to key population groups that may face legal and social barriers to accessing health services. This needs to be considered when developing PrEP services. Although the public health approach underpins the WHO guidance on PrEP, the decision to use PrEP should always be made by the individual concerned.

Target audience and scope of tool

This PrEP tool contains modules for a range of stakeholders to support them in the consideration, planning, introduction and implementation of oral PrEP. The modules can be used on their own or in combination. In addition, there is a module for individuals interested in or already taking PrEP. (See summary of modules below.)

This tool is the product of collaboration between many experts, community organizations and networks, implementers, researchers and partners from all regions. The information presented is aligned with WHO's 2016 consolidated guidelines on antiretroviral medicines.

All modules make reference to the evidence-based 2015 WHO recommendation on PrEP. They do not make any new recommendations on PrEP, focusing instead on suggested implementation approaches.

Guiding principles

It is important to adopt a public health, human rights and people-centred approach when offering PrEP to those at substantial risk of HIV. Similar to other HIV prevention and treatment interventions, a human rights-based approach gives priority to issues concerning universal health coverage, gender equality and health-related rights including accessibility, availability, acceptability and quality of PrEP services.availability, acceptability and quality of PrEP services.

SUMMARY OF MODULES

Module 1: Clinical. This module is for clinicians, including physicians, nurses and clinical officers. It gives an overview of how to provide PrEP safely and effectively, including: screening for substantial risk of HIV; testing for HIV before initiating someone on PrEP and how to follow up PrEP users and offer counselling on adherence.

Module 2: Community educators and advocates. Community educators and advocates are needed to increase awareness about PrEP in their communities. This module provides information on PrEP that should be considered in community-led activities that aim to increase knowledge about PrEP and generate demand and access.

Module 3: Counsellors. This module is for staff who counsel people as they consider PrEP or start taking PrEP and support them in coping with side-effects and adherence strategies. Those who counsel PrEP users may be lay, peer or professional counsellors and healthcare workers, including nurses, clinical officers and doctors.

Module 4: Leaders. This module aims to inform and update leaders and decision-makers about PrEP. It provides information on the benefits and limitations of PrEP so that they can consider how PrEP could be effectively implemented in their own settings. It also contains a series of frequently asked questions about PrEP.

Module 5: Monitoring and evaluation. This module is for people responsible for monitoring PrEP programmes at the national and site levels. It provides information on how to monitor PrEP for safety and effectiveness, suggesting core and additional indicators for site-level, national and global reporting.

Module 6: Pharmacists. This module is for pharmacists and people working in pharmacies. It provides information on the medicines used in PrEP, including on storage conditions. It gives suggestions for how pharmacists and pharmacy staff can monitor PrEP adherence and support PrEP users to take their medication regularly.

Module 7: Regulatory officials. This module is for national authorities in charge of authorizing the manufacturing, importation, marketing and/or control of antiretroviral medicines used for HIV prevention. It provides information on the safety and efficacy of PrEP medicines.

Module 8: Site planning. This module is for people involved in organizing PrEP services at specific sites. It outlines the steps to be taken in planning a PrEP service and gives suggestions for personnel, infrastructure and commodities that could be considered when implementing PrEP.

Module 9: Strategic planning. As WHO recommends offering PrEP to people at substantial HIV risk, this module offers public health guidance for policy-makers on how to prioritize services, in order to reach those who could benefit most from PrEP, and in which settings PrEP services could be most cost-effective.

Module 10: Testing providers. This module is for people who provide testing services at PrEP sites and laboratories. It offers guidance in selecting testing services, including screening of individuals before PrEP is initiated and monitoring while they are taking PrEP. Information is provided on HIV testing, creatinine, HBV and HCV, pregnancy and STIs.

Module 11: PrEP users. This module provides information for people who are interested in taking PrEP to reduce their risk of acquiring HIV and people who are already taking PrEP – to support them in their choice and use of PrEP. This module gives ideas for countries and organizations implementing PrEP to help them develop their own tools.

Module 12: Adolescents and young adults. This module is for people who are interested in providing PrEP services to older adolescents and young adults who are at substantial risk for HIV. It provides information on: factors that influence HIV susceptibility among young people; clinical considerations for safety and continuation on PrEP; ways to improve access and service utilization; and inclusive monitoring approaches to improve the recording and reporting of data on young people.

ANNEXES

Review of evidence. A wide range of evidence including the following two systematic reviews informed the 2015 WHO recommendation on PrEP for people at substantial risk of HIV infection: (i) Fonner VA et al. *Oral tenofovir-based HIV pre-exposure prophylaxis (PrEP) for all populations: a systematic review and meta-analysis of effectiveness, safety, behavioural and reproductive health outcomes*; (ii) Koechlin FM et al. *Values and preferences on the use of oral pre-exposure prophylaxis (PrEP) for HIV prevention among multiple populations: a systematic review of the literature*.

Annotated Internet resources. This list highlights some of the web-based resources on PrEP currently available together with the stakeholder groups they are catering to. WHO will continue to provide updates on new resources.

The monitoring and evaluation module

Oral pre-exposure prophylaxis (PrEP) is a new and empowering prevention option for people at substantial risk of HIV acquisition (see WHO recommendation, box). Among biomedical prevention interventions, PrEP is one that requires high adherence in order to be effective, needs on-going monitoring for safety through laboratory tests and repeated HIV testing and is more costly than options such as condoms.

Routine monitoring of PrEP programmes will be essential to assess uptake, effective use and safety.

Routine monitoring of PrEP programmes will be essential to assess uptake, effective use and safety, as well as to forecast demand and to ensure a sufficient, uninterrupted supply of required commodities. Furthermore, active surveillance during the early stages of implementation may be necessary to identify adverse events among pregnant and breastfeeding women and their infants, other adults and adolescents. Currently, in most countries there has been limited experience with providing PrEP outside small-scale research and demonstration projects. As health services offering PrEP expand, surveillance, monitoring and reporting systems will need to be implemented alongside PrEP services, and their progress evaluated periodically. Monitoring and evaluation (M&E) will make sure that PrEP is being delivered safely and effectively and that services focus on those who would benefit most.

PrEP services will need to be focused strategically to maximize impact with available resources (see strategic planning module). As far as possible, PrEP services should be integrated within existing services and with existing reporting systems. Programmes may choose different PrEP service delivery points depending on which populations are a priority for PrEP. These could include broader services for sexual and reproductive health, family planning, antenatal care (ANC), HIV services for serodiscordant couples, sexually transmitted infections (STIs), tertiary educational institutions and other clinical or, particularly for key populations, community outreach settings, with access to laboratory services. Integrating PrEP monitoring and reporting into existing monitoring of health services may be complex, but it is beneficial to link or integrate services where possible to make it easier for people to obtain care.

This module addresses those responsible for monitoring HIV combination prevention strategies that include PrEP at the national and site levels and those who will be implementing and overseeing the collection and analysis of data to assess PrEP services. It provides information on how to monitor the safety and effectiveness of PrEP, suggesting core and additional indicators for site-level and national monitoring and reporting. It also focuses on considerations for measuring programme performance, recognizing early challenges and using actionable data for decision making and quality improvement.

WHO Recommendation for PrEP

The World Health Organization recommends that oral PrEP containing TDF should be offered as an additional prevention choice for people at substantial risk of HIV infection as part of combination HIV prevention approaches *(strong recommendation; high quality evidence)*.

Source: Guideline on when to start antiretroviral therapy and on pre-exposure prophylaxis for HIV. Geneva, World Health Organization, September 2015. http://www.who.int/hiv/pub/guidelines/earlyrelease-arv/en/

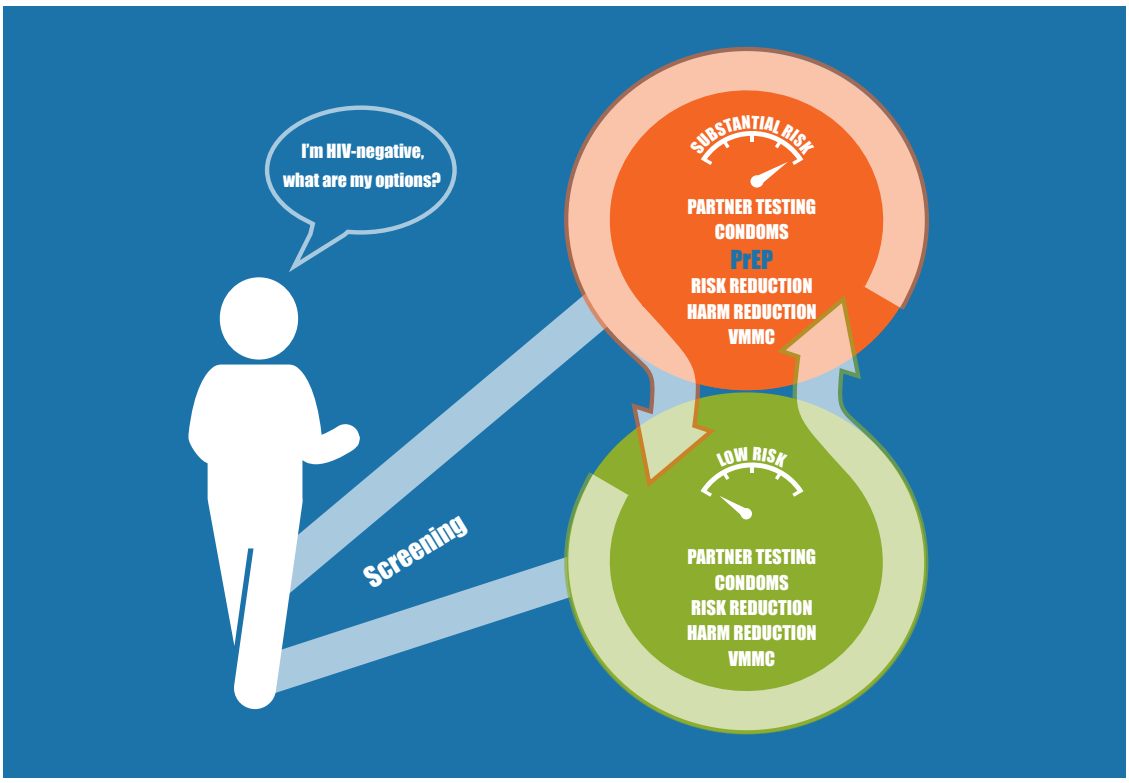
1. Overarching goals for monitoring and evaluating PrEP services

The global goals for PrEP services are to increase the effective use of PrEP among people who would most benefit from it, to enable policies that facilitate availability and access, and to contribute to UN targets to end the AIDS epidemic by 2030 *(1)*. Goals for national programmes will include increasing coverage of PrEP among priority populations, setting service delivery targets, monitoring the PrEP cascade, identifying clinical or structural areas for improvement of services, and evaluating programmes and impact.

Measuring the performance and effectiveness of PrEP programmes is challenging because individuals may appropriately or inappropriately choose to cycle on and off PrEP during perceived periods of differing HIV risk (Fig. 1). While PrEP needs to

be used appropriately in order to be effective against acquiring HIV, it does not need to be used during periods of no/low risk. Counting the number of people newly prescribed PrEP over time will provide an indication of trends in PrEP use and potential demand. However, other indicators, such as loss to follow-up, will be more difficult to measure due to differing durations of use and follow-up of PrEP users. Furthermore, where PrEP is obtained from private providers or direct online purchasing, with or without prescription, usage may be much more difficult to track. Routine monitoring systems will need to balance capturing the information needed for decision-making to improve the quality of PrEP services with avoiding undue burden on health-care providers or other service delivery staff.

Fig. 1. Risk-based HIV prevention choices in geographic regions of high HIV prevalence or for key populations



2. The PrEP cascade

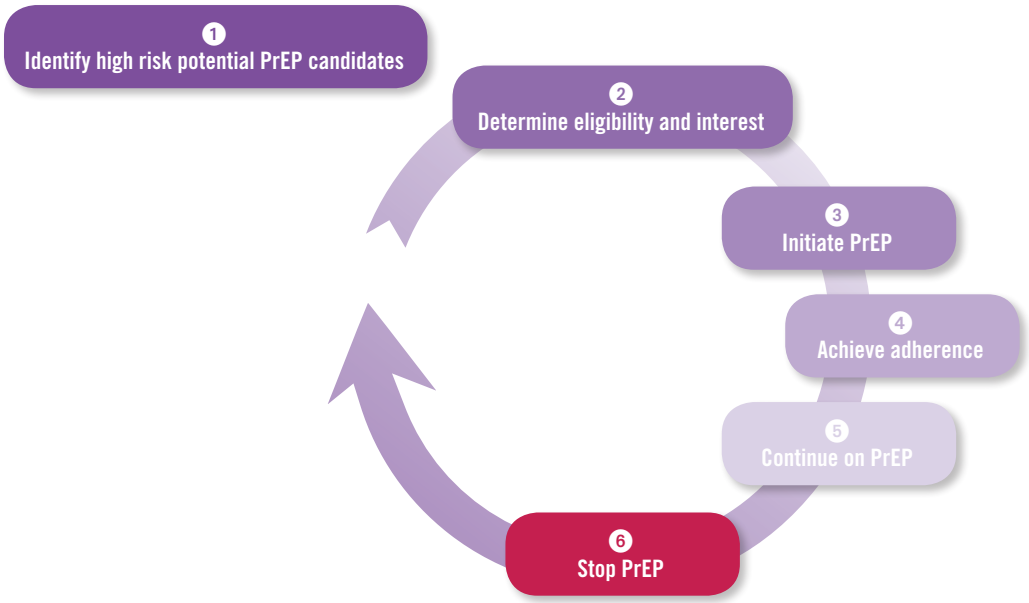
An effective PrEP programme is one in which people at substantial risk of HIV are appropriately identified, offered PrEP and then use PrEP as directed. In order to do this, PrEP programmes need to be appropriately focused according to the epidemiological profile in a given country or setting to reach the highest-risk population groups and individuals. PrEP service delivery follows a cascade that is analogous to the HIV treatment cascade (Fig. 2) and includes the following steps:

1. screening individuals for HIV risk to identify potential PrEP candidates;
2. determining eligibility and interest in PrEP;
3. initiating PrEP;
4. achieving adherence (that is, taking medicines as prescribed);
5. continuing to take PrEP over time (including clinical monitoring) if risk continues;
6. stopping PrEP.

WHO defines a population at substantial HIV risk as one where the incidence of HIV infection in the absence of PrEP is sufficiently high (>3% incidence) to make offering PrEP potentially cost-effective.

Individuals who stop PrEP may restart again at step 2 if they are still eligible and are interested in taking PrEP. Stages along this PrEP cascade can be measured through indicators (see section on indicators), which provide a programmatic overview of who is accessing PrEP and how PrEP is being used.

Fig. 2. Steps in the oral PrEP cascade to be considered for monitoring and evaluation



Source: Adapted from Liu et al. *(2)*

A critical first step in the oral PrEP cascade is identifying people at substantial HIV risk. WHO defines a population at substantial HIV risk as one where the incidence of HIV infection in the absence of PrEP is sufficiently high (typically considered >3% incidence) to make offering PrEP potentially cost-effective. Some countries, such as the United States of America, have used lower thresholds *(3)*. Prioritizing the offer of PrEP to people at substantial risk of HIV infection maximizes the benefits relative to the risks and costs. The strategic planning module of this implementation tool details how to use epidemiologic data to guide decision-making on which populations are highest priority, where PrEP services could be provided, and how PrEP could be integrated into other health services. This step in the cascade is typically quantified by the number of people who are estimated to need PrEP (see section on setting PrEP targets).

To help identify potential PrEP candidates (step 1 in the cascade), some programmes use HIV risk assessment tools. These tools help providers work with clients to assess their risk for HIV, help clients to assess their own risk or help to assess and document various criteria that may indicate a person is a potential PrEP candidate (for example, the person has used post-exposure prophylaxis (PEP)). Some risk assessment tools generate a score; these have limitations and should be used with caution. Most assessments include questions on sexual behaviour, and some potential PrEP candidates may not wish to answer these questions. Risk calculators and other assessment tools should not be used to exclude people from PrEP services, especially if they present at facilities having self-identified as being at risk and are motivated to take PrEP. The information captured in these behavioural screening tools could be recorded in clinical monitoring tools. Other programmes rely on the consultation between the client and provider to assess whether PrEP would be a beneficial option.

> Risk assessment tools should not be used to exclude people from PrEP services, especially if they consider themselves at risk and want to take PrEP.

2.1. Defining eligibility

Defining eligibility for PrEP (for step 2) will necessarily differ among countries based on local context and programme focus. However, there are three criteria that are universally essential before offering an individual PrEP (see clinical module):

1. confirmed HIV-negative status *and*
2. no signs and symptoms of acute HIV infection *and*
3. determined to be at substantial risk for HIV as defined by national guidelines (countries may define this differently).

Having clear guidance on eligibility requirements, with tools to support and harmonize eligibility assessments and documentation, is important for implementing PrEP at scale. While some eligibility criteria, such as requiring and documenting HIV-negative test results, are clear, others, such as creatinine testing, may be less straightforward. For example, Zimbabwe's national guidelines state that, when available, creatinine should be assessed prior to starting PrEP; however, when this is not possible, lack of creatinine investigation should not delay or restrict initiation of PrEP for healthy individuals under age 49 *(4)*. Similarly, the Kenyan guidelines state that every effort should be made to obtain a serum creatinine prior to initiation of PrEP, and creatinine investigations are required for monitoring on an annual basis ***(5)***.

Additionally, each person who meets these three initial criteria must consider what taking PrEP requires of them. Before potential PrEP users decide if they are willing to use PrEP, health-care providers need to explain the requirements for adherence and repeated testing that are essential to the effectiveness of PrEP. More information on this process can be found in the clinical module.

Steps 3, 4 and 5 of the cascade include the initiation of PrEP among those who are eligible and interested, achieving adherence, and continuing to take PrEP as prescribed over the period of time that individuals are at risk. Each of these stages of the cascade should ideally be measured in routine monitoring systems. The initiation of PrEP is most often measured by the uptake of PrEP among those who are eligible and offered PrEP; ideally, this measurement should distinguish between people starting PrEP for the first time and those who are restarting after a period of not taking PrEP. Each time an individual starts PrEP after a period of discontinuation, he or she must meet the eligibility criteria again. Adherence and continuation on PrEP can be defined and measured in different ways, for example, by self-report or pill counts. Monitoring systems could capture whether PrEP use has been daily, event-driven or intermittent (non-adherent). This information is valuable both for clinical monitoring and to improve programme quality.

2.2. Discontinuing PrEP versus "PrEP failure"

Individuals who stop PrEP may do so for a number of reasons. Understanding these reasons will aid in measuring PrEP programme effectiveness. Reasons for discontinuation should be recorded and monitored routinely where possible. However, where large proportions of PrEP users are lost to follow up, these reasons may not be representative of the true mix of reasons that people discontinue PrEP.

It is important to draw a distinction between PrEP programme effectiveness, which a routine monitoring system can identify based on the intended outcome of the programme, and PrEP efficacy, which is measured through randomized trials to determine how well drugs work. **People who have been prescribed PrEP and subsequently test HIV-positive, will fall into three broad groups, listed below.** The second two categories (people who stop PrEP prematurely or those who are non-adherent) should not be considered "PrEP failures". Rather they serve as indicators of programme effectiveness because they result from behavioural and operational factors that might be prevented, perhaps by better implementation.

1. **PrEP failure:** People who take PrEP consistently as prescribed and get infected with HIV while taking PrEP. It is likely that this group will be small. However, there have been a very small number of case reports of these "PrEP failures", some of which occurred when a person acquired a drug -resistant virus *(6, 7)*; other very rare case reports suggest HIV infection despite good adherence *(8–10)*.
2. **People who take PrEP inconsistently** or do not take it as prescribed. WHO recommends that oral PrEP be taken daily *(11)*. Event-driven PrEP has been shown to be effective only for men who have sex with men *(12)*, and is taken with dose(s) before and after sexual exposure. Quantifying and assessing people who seroconvert while taking PrEP inconsistently helps programmes to improve their support to PrEP users for adherence.
3. **People who stop PrEP for a variety of reasons.** It is important to quantify and assess this group and the reasons for their disengagement in care in order to inform programme improvement. For example, such improvements could include better helping people to avoid running out of PrEP tablets or facilitating re-engagement in services for people who stop PrEP and want to re-start when their risk changes.

The overall intention of indicators that measure the numbers of people who test HIV-positive after having been prescribed PrEP is to identify areas for programme quality improvement. These may include reducing delays in starting PrEP, improving adherence, securing supply and reducing loss to follow-up among those who continue to be at risk of HIV acquisition *(13)*. Programme quality improvements could include better communication of the

Indicators that measure the numbers of people who test HIV-positive after having been prescribed PrEP identify where programmes can improve.

long-term requirements for taking PrEP, enabling an individual to have better risk perception, taking measures to improve adherence, making service delivery more convenient and identifying all appropriate HIV prevention tools for a person at substantial risk. PrEP is not for everyone. People who are unlikely to adhere to PrEP or who do not want to take a pill every day can be offered other prevention options or provided additional adherence counselling, and, should their situation change, they can be offered PrEP in the future.

3. Setting PrEP targets

Targets help motivate programmes to reach people who may benefit most from PrEP services.

Setting national and sub-national PrEP targets helps decision-makers, service providers and data managers to strategize the direction of a PrEP programme and to assess the budgetary allocation for PrEP. Targets also help motivate programmes to reach people who may benefit most from PrEP services. In most settings, PrEP will be a new prevention choice and there is often limited knowledge about the benefits of PrEP among some providers and communities. Slow initial uptake is therefore to be anticipated and a phased approach to targets could be considered with lower targets in the first year(s). Having overly ambitious targets as performance indicators may inadvertently pressure providers to offer PrEP, including to people who may initially accept PrEP but who then do not return, having not fully understood or recognized its benefits. This will depend on the context, as some communities have greater awareness than others. In other settings carefully considered demand creation and community awareness will need to be developed in parallel to PrEP service provision.

Calculations of targets and anticipated PrEP coverage are notoriously difficult to determine due to the levels of uncertainty surrounding the estimated "population in need". In this case "need" is premised on HIV-negative people living in geographic regions of high HIV incidence/prevalence and/or whose behaviour (either their own or their partners') puts them at substantial risk of acquiring HIV. Members of key population groups (men who have sex with men and transgender people in all regions; sex workers, people who inject drugs, and prisoners and those in closed settings where epidemiology warrants), as well as adolescent girls and young women in Eastern and Southern Africa, are some groups with known high HIV incidence. The size of key population groups is often difficult to estimate because the criminalization of the behaviours that expose key populations to higher risk of HIV infection and the stigma and discrimination that they face leads to these populations being "hidden". Surveys are required to estimate the size of key populations and the HIV prevalence or incidence within them. However, the lack of size estimation surveys should not preclude setting realistic initial targets with available estimates. These estimates can then be adjusted when demand is better understood following implementation. The World Health Organization (WHO), the United Nations Joint Programme on HIV/AIDS (UNAIDS) and other partners are exploring quantitative methods to set targets for serving key populations. Guidance on the use of these methods will be published when current investigations into the best methods are concluded.

Countries and programmes wishing to offer PrEP could use the most recent available epidemiologic data from surveys or programmes to make rough estimates of the numbers of people who may benefit from PrEP, could be reached, and who may decide to use PrEP. More information on potential data sources, including mathematical models and their uses, can be found in the strategic planning module.

Simple targets may include offering PrEP to the following groups:

- **Key populations**
  One approach to target setting could start with the estimated size of key population groups (whether through surveys, regional/global averages, or programme data), applying the estimated proportion who are negative, and among those, the proportion at substantial risk and who may be reached with services. Another more conservative approach is to estimate the numbers who are known to access clinics or community-based organizations serving groups of particular concern, such as sex workers or men who have sex with men, in settings where HIV prevalence/incidence is known to be high among a particular key population, and similarly applying the proportions expected to be negative. PrEP uptake among those offered may differ considerably between different groups, and may rise as awareness and demand for PrEP grow.
- **Serodiscordant couples**
  PrEP could be offered to HIV-negative people in serodiscordant partnerships until the HIV-positive partner achieves viral suppression on antiretroviral treatment (ART). It is important to note that not all people in serodiscordant partnerships are aware of it; also, some couples may choose other prevention options.

  Estimates of the number of serodiscordant couples could come from a combination of programmatic data on the number of people starting treatment and viral suppression rates combined with findings from national surveys (such as AIDS Indicator Surveys or Population-based HIV Impact Assessments) that estimate the proportion of people in

serodiscordant relationships. A simple formula to calculate this could be: the number of people starting ART multiplied by the probability of being in a discordant relationship. An upper limit would be the number of people starting treatment per year, which assumes that all are in discordant relationships. For most ART regimens, viral suppression is expected in >90% of patients six months after treatment initiation *(11)*. So, average duration of PrEP use by a serodiscordant partner could be conservatively estimated at seven months in order to account for possible delays in appointments or in obtaining viral load results. Some HIV-negative partners may wish to continue on PrEP if they are unsure of their partners' treatment adherence.

- **Pregnant women**
  Targets for pregnant women may be estimated from census data of women of reproductive age living in very high prevalence regions, applying local fertility rates, ANC coverage rates, ANC HIV testing rates, and HIV incidence in pregnancy in order to reach the numbers who may eventually be screened for PrEP.
- **Adolescents and young people**
  Approaches to reach other disperse groups that may not access services readily, such as adolescent girls and young women, are more complex but involve similar processes. The proportions of young girls in high prevalence regions who engage in higher risk behaviour or who have been pregnant or who have had an STI, as reported by national surveys, could be multiplied by the population of HIV-negative young girls in a given region to estimate the numbers at risk. However, the numbers that could potentially be reached depends on their use of services. This can be estimated from programmatic data that are disaggregated by age, sex and location. The target could be set to fall between the number currently being reached and the estimated number at risk in order to foster greater efforts to reach girls and young women at risk.

4. Strategies for routine PrEP monitoring

To improve programme performance, data must be analysed and the results used to inform programme strategy and decisions. A monitoring and reporting strategy should maximize data quality and minimize the burden on health workers by collecting and reporting only data and indicators at site, sub-national and national levels that are necessary for decision-making at each of those levels.

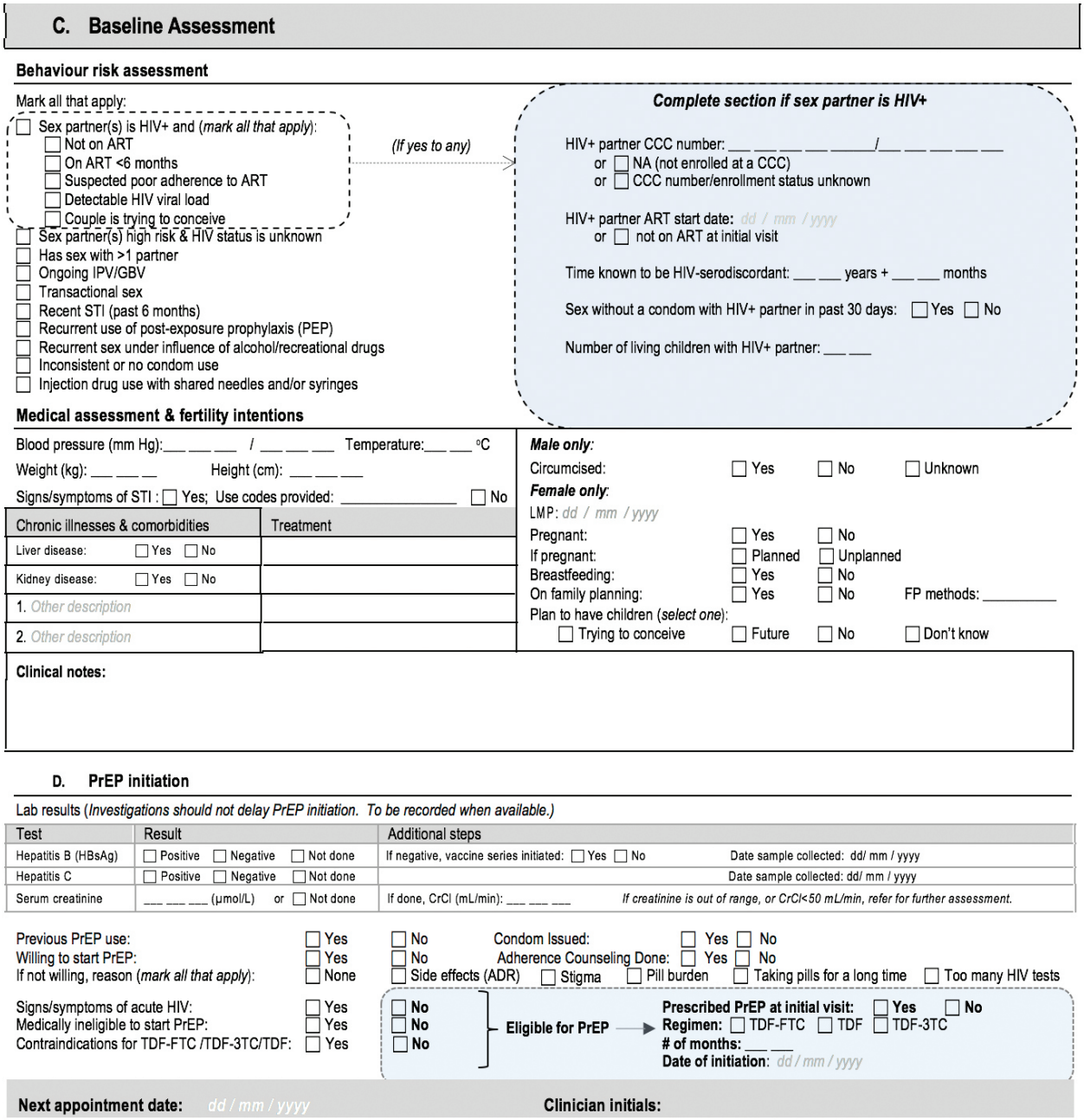
To improve performance, data must be analysed and the results used to inform strategy and decisions.

Even within a country, programme performance may differ by geography, sub-population and service type. It is useful to develop a monitoring framework that can be used across a range of implementation approaches and for different populations to allow consistent reporting and comparisons of effectiveness and outcomes across sites and approaches.

Many countries have reporting systems for health services such as HIV testing, ANC and treatment for STIs, and PrEP monitoring can be integrated into them. However, PrEP services will need their own reporting forms and registers to track individuals through the cascade from initial screening through regular follow-up over a period of months. Since PrEP will often be implemented in a phased manner, there will be opportunities to revise and refine the inclusion of PrEP within these existing systems or to develop cross-referral mechanisms with newly implemented PrEP reporting systems. Forms for assessing PrEP eligibility can be used by providers to determine whether to offer PrEP (Fig. 4), and to measure adherence among PrEP users, yet only some of this information needs to be reported at the national level. Suggested core indicators are discussed in detail later in section 5 of this module.

Monitoring and reporting systems for PrEP will need to avoid inadvertent duplicate reporting of indicators at site, sub-national and national levels. In settings without unique patient identifiers, duplicates may occur from two main sources: 1) people obtaining PrEP from several different sites, such as the private sector and the Internet, and 2) people who have been prescribed PrEP and then discontinued being registered a second time in a reporting period. In order to minimize duplication, it will be important to bring together data managers, programme managers and public health officials to think through critical reporting indicators, means of identification, and how best to maximize reporting accuracy and the linkage between service types. For example, a programme offering PrEP to women will need to assess how PrEP recording and reporting will change if she becomes pregnant and moves from a general outpatient PrEP service to regular ANC visits and back to outpatient services postpartum. Will PrEP prescriptions remain tied to the originating site, or will there be flexibility for women to choose where to receive their medicines? Optimizing choice for women who continue to be at substantial risk during pregnancy *(14)* may be most beneficial in preventing PrEP discontinuation. Data systems must be able to adjust for these changes; otherwise, such a person could be counted three times over the course of one year. Similarly, people who move or choose different service providers should ideally be referred and identified as being transferred.

Fig. 4. Example tool for determining eligibility for PrEP



C. Baseline Assessment

Behaviour risk assessment

Mark all that apply:

☐ Sex partner(s) is HIV+ and (*mark all that apply*):
- ☐ Not on ART
- ☐ On ART <6 months
- ☐ Suspected poor adherence to ART
- ☐ Detectable HIV viral load
- ☐ Couple is trying to conceive

(If yes to any)

☐ Sex partner(s) high risk & HIV status is unknown
☐ Has sex with >1 partner
☐ Ongoing IPV/GBV
☐ Transactional sex
☐ Recent STI (past 6 months)
☐ Recurrent use of post-exposure prophylaxis (PEP)
☐ Recurrent sex under influence of alcohol/recreational drugs
☐ Inconsistent or no condom use
☐ Injection drug use with shared needles and/or syringes

Complete section if sex partner is HIV+

HIV+ partner CCC number: ___ ___ ___ ___ _____/___ ___ ___ ___ ___
or ☐ NA (not enrolled at a CCC)
or ☐ CCC number/enrollment status unknown

HIV+ partner ART start date: *dd / mm / yyyy*
or ☐ not on ART at initial visit

Time known to be HIV-serodiscordant: ___ ___ years + ___ ___ months

Sex without a condom with HIV+ partner in past 30 days: ☐ Yes ☐ No

Number of living children with HIV+ partner: ___ ___

Medical assessment & fertility intentions

Blood pressure (mm Hg):___ ___ ___ / ___ ___ ___ Temperature:___ ___ °C

Weight (kg): ___ ___ ___ Height (cm): ___ ___ ___

Signs/symptoms of STI : ☐ Yes; Use codes provided: _____ ☐ No

Chronic illnesses & comorbidities	Treatment
Liver disease: ☐ Yes ☐ No	
Kidney disease: ☐ Yes ☐ No	
1. *Other description*	
2. *Other description*	

Male only:
Circumcised: ☐ Yes ☐ No ☐ Unknown

Female only:
LMP: *dd / mm / yyyy*
Pregnant: ☐ Yes ☐ No
If pregnant: ☐ Planned ☐ Unplanned
Breastfeeding: ☐ Yes ☐ No
On family planning: ☐ Yes ☐ No FP methods: _____
Plan to have children (*select one*):
☐ Trying to conceive ☐ Future ☐ No ☐ Don't know

Clinical notes:

D. PrEP initiation

Lab results (*Investigations should not delay PrEP initiation. To be recorded when available.*)

Test	Result	Additional steps
Hepatitis B (HBsAg)	☐ Positive ☐ Negative ☐ Not done	If negative, vaccine series initiated: ☐ Yes ☐ No — Date sample collected: dd/ mm / yyyy
Hepatitis C	☐ Positive ☐ Negative ☐ Not done	Date sample collected: dd/ mm / yyyy
Serum creatinine	___ ___ ___ (µmol/L) or ☐ Not done	If done, CrCl (mL/min): ___ ___ ___ *If creatinine is out of range, or CrCl<50 mL/min, refer for further assessment.*

Previous PrEP use: ☐ Yes ☐ No
Willing to start PrEP: ☐ Yes ☐ No
If not willing, reason (*mark all that apply*): ☐ None ☐ Side effects (ADR) ☐ Stigma ☐ Pill burden ☐ Taking pills for a long time ☐ Too many HIV tests

Condom Issued: ☐ Yes ☐ No
Adherence Counseling Done: ☐ Yes ☐ No

Signs/symptoms of acute HIV: ☐ Yes ☐ No
Medically ineligible to start PrEP: ☐ Yes ☐ No
Contraindications for TDF-FTC /TDF-3TC/TDF: ☐ Yes ☐ No

Eligible for PrEP →
Prescribed PrEP at initial visit: ☐ Yes ☐ No
Regimen: ☐ TDF-FTC ☐ TDF ☐ TDF-3TC
# of months: ___ ___
Date of initiation: *dd / mm / yyyy*

Next appointment date: *dd / mm / yyyy* **Clinician initials:**

Source: Ministry of Health, Kenya clinical encounter record

4.1. Site level monitoring and reporting

At the site level, actionable data for clinic managers could include those that identify potential PrEP users and those that summarize eligibility screening, offer, uptake, adherence, retention, HIV test results over time, referrals and adverse events. These could be recorded in screening tools (see Fig. 4 for example) and/or a patient medical record. PrEP site-level registers will need to capture certain detailed data on each person prescribed PrEP in order to populate summary reporting forms for national levels. These may include HIV testing, drug regimens, toxicity, adherence, adverse events and follow-up over time. The results of laboratory testing, such as creatinine testing and other factors decided by the national programme, could be included. Fig. 5 presents an example of a register.

The proportions of people who initiate PrEP and who are retained on PrEP can help inform drug forecasting at site, sub-national and national levels. It is important to note that people who test HIV-positive after having been prescribed

Fig. 5. Example of a PrEP client register

Date	Patient ID Number	Name & Surname	Contact Number (Cell/Tel)	Age (years)	Key populations client?	If key population (KP): KP group classification (MSM/TG/SW/PWID - *tick all that apply*)	Initial HIV Test			Creatinine (eGFR)	STI syndrome (see codes). *If STI: Date started treatment*	PrEP (ARVs) prescribed	Number of tablets	Follow-up Visit 1						Follow-up Visit 2						Stopped PrEP	
							Date tested	Result: (R/NR/Inc)	Date Client Received Result					Date	HIV Re-testing: Date Re-tested	HIV Re-testing: Result (R/NR/Inc)	Side effects (see codes)	PrEP (ARVs) prescribed	Number of tablets	Date	HIV Re-testing: Date Re-tested	HIV Re-testing: Result (R/NR/Inc)	Side effects (see codes)	PrEP (ARVs) prescribed	Number of tablets	Date	Reasons (see codes)
					□Yes □No	□MSM □TG □SW □PWID						□ TDF/FTC □ TDF/3TC □ TDF						□ TDF/FTC □ TDF/3TC □ TDF						□ TDF/FTC □ TDF/3TC □ TDF			
					□Yes □No	□MSM □TG □SW □PWID						□ TDF/FTC □ TDF/3TC □ TDF						□ TDF/FTC □ TDF/3TC □ TDF						□ TDF/FTC □ TDF/3TC □ TDF			
					□Yes □No	□MSM □TG □SW □PWID						□ TDF/FTC □ TDF/3TC □ TDF						□ TDF/FTC □ TDF/3TC □ TDF						□ TDF/FTC □ TDF/3TC □ TDF			
					□Yes □No	□MSM □TG □SW □PWID						□ TDF/FTC □ TDF/3TC □ TDF						□ TDF/FTC □ TDF/3TC □ TDF						□ TDF/FTC □ TDF/3TC □ TDF			

Note: MSM=men who have sex with men; TG=transgender; SW=sex worker; PWID=people who inject drugs

PrEP-limiting toxicity codes: GI=gastrointestinal (nausea, diarrhoea, abdominal pain, vomiting); Skin=rash, hypersensitivity reaction; P=peripheral neuropathy (burning/numbness/tingling); CNS=central nervous system (dizziness, anxiety, nightmare, depression, seizures); Hep=hepatic dysfunction (jaundice); Hem=haematological (anaemia, neutropenia); F=fatigue; H=headache; B=bone dysfunction (fractures, osteopenia); M=metabolic (body fat changes, hyperglycaemia, dyslipidaemia); K=Kidney dysfunction (nephrolithiasis, renal insufficiency)

Stopped PrEP reasons: H=tested HIV+; R=no longer at substantial risk; S=side effects; C=client preference. *Specify any other reasons.*

STI syndromes: U=urethral discharge; G=genital ulcers; V=vaginal discharge; L=lower abdominal pain; S=scrotal swelling; I=inguinal bubo; O=other-(*specify*)

Source: Adapted from ICAP, Columbia University, available at: http://icap.columbia.edu/resources/detail/pre-exposure-prophylaxis-prep-package

PrEP may or may not have been taking PrEP at the time of exposure. Since recall of PrEP usage may be problematic, asking about recent use, such as in the past week or month, may provide mode accurate information. Finally, any adverse events associated with PrEP, including drug-related toxicity or social harm, should trigger an immediate response at the facility level and then be reported forward in an accelerated manner.

4.2. Sub-national and national reporting

Sub-national and national level indicators for PrEP should measure, at a minimum, uptake, continuation, safety, number of people who test HIV-positive after being prescribed PrEP and possible reasons for PrEP discontinuation or failure following seroconversion.

5. Programmatic PrEP indicators

Finding a balance between obtaining actionable data and the reporting burden on health providers and systems is essential. Ultimately, core indicators that measure key elements of a programme should be measured at all levels of the health system (site, sub-national, national), while additional indicators should be collected depending on feasibility and timeliness for decision-making. Only indicators that are actionable for those reviewing the data at a given level are worth collecting at that level. Sites will necessarily collect far more detailed information in order to assess eligibility, follow PrEP users, measure their adherence and respond to any adverse events that occur over time than is needed at sub-national or national levels. For example, sites may collect detailed information on outcomes of each HIV test, descriptions of adverse events and their outcomes, number of contact attempts before a person was determined to be lost to follow-up and so forth. Few of these will be needed at sub-national or national levels. Minimal reporting requirements have the advantage of enhancing accuracy, enabling more timely reporting and allowing for more rapid review.

Only indicators that are actionable for those reviewing the data at a given level are worth collecting at that level.

5.1. Suggested core indicators

The following four core indicators are a minimum set suggested for the routine monitoring of PrEP programmes to assess uptake, continuation and safety. Each indicator measures an important aspect of PrEP implementation that can serve as a measure of progress and flag areas that may warrant further investigation. Their selection was based on global applicability, feasibility and utility for assessing PrEP programme performance. The fourth indicator on HIV-positivity among people who have been prescribed PrEP ("seroconversion") is important but may be difficult to interpret due to potential differential loss to follow up. The four core indicators are:

Minimal reporting requirements have the advantage of enhancing accuracy, enabling more timely reporting and allowing for more rapid review.

1. PrEP uptake
2. early continuation on PrEP
3. toxicity prevalence among people who have been prescribed PrEP
4. HIV positivity among people who have been prescribed PrEP.

To facilitate comparisons among countries and programmes, these four core indicators should be incorporated as much as possible into national HIV programme monitoring frameworks.

Additionally, in order to track PrEP use globally, the following UNAIDS/WHO approved Global AIDS Monitoring indicator is suggested for annual reporting:

Number of people who received oral pre-exposure prophylaxis at least once during the reporting period.

This indicator includes people who initiated PrEP for the first time, those who may have discontinued and restarted PrEP in the reporting period, as well as those continuing on PrEP. It is recommended that the indicator be disaggregated by people who received PrEP for the first time in their lives, by gender, age (<15, 15+, 15-19, 20-24, 25-49, 50+ years) and key population (men who have sex with men, sex workers, people who inject drugs, transgender people and prisoners). For the complete indicator definition and data collection methodology, please refer to the Global AIDS Monitoring guidelines (http://www.unaids.org/sites/default/files/media_asset/global-aids-monitoring_en.pdf).

Indicator	PrEP 1. PrEP Uptake
Indicator definition	Percentage of eligible people who initiated oral antiretroviral PrEP in the last 12 months.
Overview	This indicator is key to assessing uptake of PrEP among those who are eligible. People who initiated oral PrEP includes those who started PrEP for the first time and those who may have discontinued PrEP and restarted PrEP in the reporting period. Through disaggregation, this indicator will also monitor the use of PrEP by first-time users and by population (age, gender and key population). Eligibility for starting PrEP will vary among countries and programmes based on national guidelines for PrEP. Eligibility should include at a minimum: 1) HIV-negative status and 2) no signs and symptoms of acute HIV. The third criteria, whether an individual is at substantial risk for HIV and may benefit from PrEP, will be contextual and should be based on national guidelines. The main factors that influence HIV risk are a person's own and their partner(s)' sexual and drug-using behaviour, their partner(s)' HIV status, the overall background HIV prevalence and incidence where they live and the sub-population to which they may belong. Populations to whom PrEP may be offered as a priority may include key populations (men who have sex with men, sex workers, people who inject drugs, people in prisons and other closed settings, and transgender people), serodiscordant couples, and other priority populations such as adolescent girls and young women in certain high incidence settings. Countries or programmes may have additional eligibility criteria, for example, people who have used post-exposure prophylaxis (PEP). Contraindications for PrEP include: HIV infection, signs/symptoms of acute HIV infection among people who have had a recent HIV exposure, probable recent exposure to HIV, estimated creatinine clearance of less than 60ml/min (if known) and allergy or contraindication to any medicine in the PrEP regimen. More details are provided in the clinical module.
Priority level	National, sub-national, facility
Numerator	The number of people who initiated oral PrEP in the last 12 months.
Denominator	Number of people who were newly offered PrEP in the last 12 months.
Calculation	Numerator/denominator
Data collection methodology	The numerator is generated by counting the number of people who initiated oral PrEP during the last 12 months, among those who were newly offered PrEP in the reporting period. The numerator includes people who received PrEP for the first time, and those who had previously discontinued PrEP and restarted PrEP in the reporting period. Regular PrEP users who are continuing on PrEP should be excluded from both the numerator and denominator. The numerator should count each individual only once in a given reporting period. All people who received oral PrEP through national programmes, demonstration projects, research or through private means and are taking it according to WHO/UNAIDS standards should be included. The denominator is generated by counting the number of people who were newly offered PrEP after meeting eligibility criteria. An individual should only be counted once in a given reporting period even if they initiated PrEP more than once after a period of discontinuation. Age is defined as the age at the time the person initiates PrEP. If a person identifies as belonging to more than one key population, all should be recorded. The sum of the data disaggregated by type of key populations can, therefore, be greater than the total. Transgender data can also be disaggregated by different gendered groups: male, female and non-binary.
Frequency	Data should be collected continuously at the facility level, aggregated periodically and aligned with the reporting frequency of other routinely collected indicators (often monthly or quarterly). These data should then be combined for annual reporting.
Disaggregation	• People who received PrEP for the first time in their lives • Age (15–19, 20–24, 25–49 and 50+ years) • Gender (male, female or transgender) • Key population (men who have sex with men, sex workers, people who inject drugs, people in prisons and other closed settings, and transgender people) • Geographic and other administrative areas of importance.
Related indicators	UNAIDS Global AIDS Monitoring indicator 3.15: Number of people who received oral antiretroviral PrEP at least once during the reporting period. PEPFAR Monitoring Evaluation and Reporting indicator PrEP_NEW: Number of individuals who have been newly enrolled on antiretroviral pre-exposure prophylaxis (PrEP) to prevent HIV infection in the reporting period. The Global Fund HIV indicators KP-6a, 6b, 6c: Percentage of: a) men who have sex with men b) transgender people and c) sex workers using pre-exposure prophylaxis in priority pre-exposure prophylaxis populations.

Indicator	PrEP 2. Continuation on PrEP
Indicator definition	Percentage of PrEP users who continued on oral PrEP for three consecutive months after having initiated PrEP in the last 12 months.
Overview	This indicator measures the continuation of PrEP among people who start PrEP and also assesses loss to follow-up. Early experience in demonstration projects and small programmes indicates that many users who discontinue oral PrEP do so during the first few months. This indicator provides a measure of early PrEP discontinuation as well as an indication of the number likely to continue taking PrEP. Furthermore, risk for HIV (and, therefore, need for oral PrEP use) is unlikely to change in a period shorter than three months, although it is possible. If the percentage of people who continue on PrEP at three months is low, further investigation into the reasons that people stopped taking PrEP (whether due to side-effects, changes in behaviour/risk or structural factors) could be determined and programmes adjusted as needed.
Priority level	National, sub-national, facility
Numerator	Number of people who continued on PrEP for three consecutive months after having initiated PrEP in the last 12 months.
Denominator	Number of people who initiated oral PrEP in the last 12 months.
Calculation	Numerator/denominator
Data collection methodology	The numerator is generated by counting the number of people who initiated oral PrEP in the last 12 months and who continued on PrEP for 3 consecutive months. People who initiated PrEP includes people who received PrEP for the first time, and those who had previously discontinued PrEP and restarted PrEP in the reporting period. Regular PrEP users who are continuing on PrEP should be excluded from both the numerator and denominator. Some PrEP visit schedules may include a first visit one month after PrEP initiation, a second visit two months later, and visits every three months thereafter. In this case, the continuation indicator would be measured at the second visit, three months after PrEP initiation. This measurement periodicity will be consistent with programs that only have three monthly visits and will also comply with routine quarterly reporting. All people who return for the three-month visit and took PrEP until that time should be counted, whether or not they chose to continue with PrEP after the three-month visit. The denominator is generated by counting the number of people who initiated oral PrEP during the last 12 months (numerator of Indicator PrEP 1) in accordance with national guidelines or WHO/UNAIDS standards. The denominator should include all people who initiated oral PrEP during the last 12 months, whether through national programmes, demonstration projects or research. An individual should only be counted once in a given reporting period even if they were offered PrEP more than once, as may happen if someone initiates, discontinues, and restarts PrEP in the same reporting period. Individuals who initiate PrEP in the last 2 months of the reporting period will have their continuation appointments in the next reporting period. These individuals should be counted in the period in which they initiated PrEP. For example, if a person started PrEP in December 2017, their continuation on PrEP would be measured in March 2018. They would be reported as continuing on PrEP in the 2017 reporting period (when PrEP was initiated) and not in 2018 reporting (unless they stopped and re-initiated PrEP again in 2018). This is to enable comparisons with the numbers from the uptake indicator and for consistency across reporting periods. If a person identifies as belonging to more than one key population, all should be recorded. The sum of the data disaggregated by type of key populations can, therefore, be greater than the total. Transgender data can also be disaggregated by different gendered groups: male, female and non-binary.
Frequency	Data should be collected continuously at the facility level, aggregated periodically and aligned with the reporting frequency of other routinely collected indicators (often monthly or quarterly). These data should then be combined for annual reporting.
Disaggregation	• Age (15–19, 20–24, 25–49 and 50+ years) • Gender (male, female or transgender) • Key population (men who have sex with men, sex workers, people who inject drugs, people in prisons and other closed settings, and transgender people) • Geographic and other administrative areas of importance.
Related indicator	• PEPFAR Monitoring Evaluation and Reporting Indicator: PrEP_CURR: Number of individuals, inclusive of those newly enrolled, that received oral antiretroviral pre-exposure prophylaxis (PrEP) to prevent HIV during the reporting period.

Indicator	PrEP 3. PrEP associated toxicity prevalence
Indicator definition	Percentage of people who received oral PrEP who have discontinued or interrupted PrEP due to a serious ARV-associated toxicity in the last 12 months.
Overview	Toxicity prevalence associated with PrEP is expected to be low. However, experience with large-scale PrEP programmes and longer exposure has been limited. Therefore, active surveillance and toxicity monitoring for people using PrEP is important in order to identify potential adverse outcomes that may arise as PrEP programmes scale up and reach larger numbers of people. The major expected toxicities related to the use of PrEP are bone and renal toxicities associated with tenofovir in populations with associated risk factors. During pregnancy, there is growing evidence for the safety of tenofovir and/or emtricitabine when used for treatment and prevention of mother-to-child transmission in HIV- or HBV-infected pregnant women. Additional surveillance programmes are needed to evaluate PrEP safety during pregnancy and breastfeeding (see section below on special considerations during pregnancy). The 2016 WHO Consolidated ARV Guidelines state that there is no safety-related rationale for disallowing or discontinuing PrEP use during pregnancy and breastfeeding for HIV-negative women who remain at risk of HIV acquisition. Adverse drug reactions leading to PrEP discontinuation or interruption should be routinely recorded in an appropriate PrEP register for each PrEP client. Action should be taken at the facility as soon as a serious adverse reaction is recorded.
Priority level	National, sub-national, facility
Numerator	Number of people who received oral PrEP and have discontinued or interrupted PrEP due to a serious ARV-related toxicity in the last 12 months.
Denominator	Number of people who received oral PrEP at least once in the last 12 months.
Calculation	Numerator/denominator
Data collection methodology	The numerator is generated by counting the number of people taking oral PrEP who have discontinued or interrupted PrEP due to PrEP-limiting serious adverse drug toxicity in the last 12 months, defined as a life-threatening illness, death, hospitalization or disability or any adverse drug reaction that resulted in PrEP discontinuation. The denominator is generated by counting the number of people who received oral PrEP at least once during the last 12 months in accordance with national guidelines or WHO/UNAIDS standards. People who received oral PrEP at least once includes those who initiated PrEP for the first time and those who may have discontinued PrEP and restarted PrEP in the reporting period, as well as those who are continuing on PrEP. The denominator should include all people who received oral PrEP at least once during the last 12 months, whether through national programmes, demonstration projects or research. If a person identifies as belonging to more than one key population, all should be recorded. The sum of the data disaggregated by type of key populations can, therefore, be greater than the total. Transgender data can also be disaggregated by different gendered groups: male, female and non-binary.
Frequency	Data should be collected continuously at the facility level, aggregated periodically and aligned with the reporting frequency of other routinely collected indicators (often monthly or quarterly). These data should then be combined for annual reporting.
Disaggregation	• Age (15–19, 20–24, 25–49 and 50+ years) • Gender (male, female or transgender) • Key population (men who have sex with men, sex workers, people who inject drugs, people in prisons and other closed settings, and transgender people) • Geographic and other administrative areas of importance.
Special considerations during pregnancy	Adverse maternal and birth outcomes among pregnancies exposed to PrEP should be collected through birth defect surveillance and pregnancy registries extended to include 18-month old infants and mother–infant pairs during breastfeeding. Existing national registries and surveillance programmes could be extended to a selection of antenatal clinics where a high number of pregnancies that are possibly exposed to PrEP are expected. Forms and registers in these reporting systems will need to be adapted to include PrEP.
Additional information	Related Indicator: UNAIDS Global AIDS Monitoring indicator 3.15: Number of people who received oral antiretroviral PrEP at least once during the reporting period. WHO guidance documents and guidelines describe key approaches on ARV toxicity monitoring: WHO implementation tool for monitoring the toxicity of new antiretroviral and antiviral medicines in HIV and viral hepatitis programmes. http://www.who.int/hiv/pub/arv_toxicity/arv-toxicity-monitoring-tool/en/. Consolidated guidelines on the use of antiretroviral drugs for treating and preventing HIV infection: Recommendations for a public health approach - Second edition. http://www.who.int/hiv/pub/arv/arv-2016/en/. See section 4.6, Monitoring of and substitution for ARV drug toxicities. March 2014 supplement to the 2013 consolidated guidelines on the use of antiretroviral drugs for treating and preventing HIV infection. Recommendations for a public health approach. http://www.who.int/hiv/pub/guidelines/arv2013/arvs2013upplement_march2014/en/. See chapter 11, Monitoring and evaluation, including surveillance of ARV drug toxicity monitoring and surveillance of drug resistance. WHO consolidated strategic information guidelines for HIV in the health sector. http://www.who.int/hiv/pub/guidelines/strategic-information-guidelines/en/. See section 2.4.5c, Toxicity monitoring. WHO consolidated guidelines on person-centred HIV patient monitoring and case surveillance. http://www.who.int/hiv/pub/guidelines/strategic-information-guidelines/en/.

Indicator	PrEP 4. HIV positivity among people who have been prescribed PrEP
Indicator definition	Percentage of people who test HIV-positive among people who received PrEP at least once in the last 12 months and had at least one follow up HIV test.
Overview	This indicator measures the percentage of people who test HIV positive after being prescribed PrEP. HIV testing is required before starting PrEP, and regularly thereafter while taking PrEP. The HIV test to determine PrEP eligibility is not included in either the numerator or the denominator. The last recorded HIV test in the reporting period is counted. Using quality-assured HIV testing is important, and timely linkage of people who test positive to HIV treatment services is essential. PrEP is highly effective when taken as prescribed. People who test HIV positive after having received PrEP may have had acute undetected HIV infection when they started PrEP. Other potential reasons for testing positive are poor adherence which results in reduced concentrations of PrEP and reduced effectiveness in case of exposure, or the acquisition of drug-resistant virus. Measuring the proportion of PrEP users who test HIV-positive is problematic in the absence of individual-level, longitudinal monitoring data. Determining the denominator of "all PrEP users" is hampered by differential follow-up and the unknown HIV status of those who are lost to follow-up. Furthermore, follow-up may differ by site, location or by population (for example, men versus women). Therefore, using a denominator of all people prescribed PrEP in a given period can be misleading, as apparent very low levels of HIV positivity could result equally from high adherence to PrEP or from non-adherence and loss to follow-up. Therefore, this indicator should be interpreted with caution, particularly in instances with high loss to follow up and may not be appropriate for comparisons across different service delivery types or locations. This indicator is not a measure of PrEP efficacy. It serves as an indicator for programme performance to further investigate the potential reasons for seroconversion, and if appropriate, to adjust programs (such as for eligibility screening or adherence counseling) as needed. It is difficult to accurately determine the reasons for seroconversion, or to assess adherence retrospectively. In order to minimize recall bias, asking PrEP users about recent adherence (over the past week or month) may be beneficial.
Priority level	National, sub-national, facility
Numerator	Number of people who had a positive HIV follow-up test among people who received oral PrEP at least once in the last 12 months.
Denominator	Number of people who received oral PrEP at least once in the last 12 months, and who had at least one follow up HIV test.
Calculation	Numerator/denominator
Data collection methodology	The numerator is generated by counting the total number of people who have an HIV-positive follow-up test result among people who received oral PrEP at least once in the last 12 months and who had at least one follow up HIV test. The numerator should not include people who last used PrEP greater than 12 months prior to the HIV test date. The denominator is generated by counting the number of people who received PrEP at least once in the last 12 months and who had at least one follow up HIV test taken in the reporting period. Only the most recent test result should be counted. For example, if a person used PrEP for 12 months, and during that time received 4 HIV-negative tests to enable them to continue on PrEP, their contribution to the denominator would be 1. Similarly, if a PrEP user only has 2 recorded HIV tests in the reporting period, one of which was HIV-positive, they would contribute 1 to the numerator and 1 to the denominator. The first HIV test conducted to determine PrEP eligibility should **not** be included in the numerator or denominator. This test should be HIV-negative for all people who are prescribed PrEP. People who test HIV-positive as part of PrEP eligibility screening should not be included in the numerator or denominator as they would not be prescribed PrEP. If a person identifies as belonging to more than one key population, all should be recorded. The sum of the data disaggregated by type of key populations can, therefore, be greater than the total. Transgender data can also be disaggregated by different gendered groups: male, female and non-binary.
Frequency	If a person identifies as belonging to more than one key population, all should be recorded. The sum of the data disaggregated by type of key populations can, therefore, be greater than the total. It may be beneficial to further disaggregate transgender people into transgender men, transgender women and non-binary. Data should be collected continuously at the facility level, aggregated periodically, and aligned with the reporting frequency of other routinely collected indicators (often monthly or quarterly). These data should then be combined for annual reporting.
Disaggregation	• Age (15–19, 20–24, 25–49 and 50+ years) • Gender (male, female or transgender) • Key population (men who have sex with men, sex workers, people who inject drugs, people in prisons and other closed settings, and transgender people) • Geographic and other administrative areas of importance

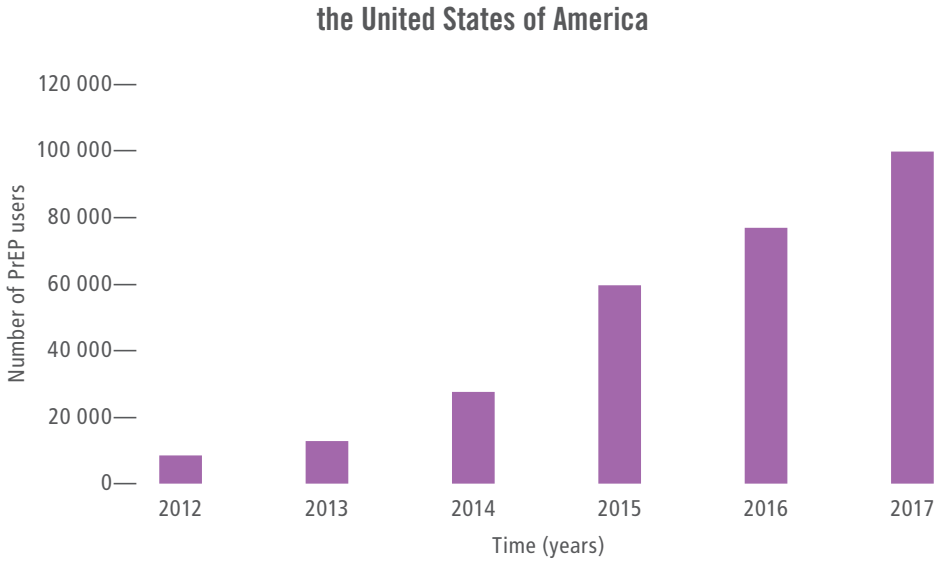
Many other possible indicators can be used to examine in more detail different aspects of a PrEP programme. For example, monitoring longer-term retention on PrEP, at 6 or 12 months after initial use among those who continue PrEP beyond the first three months is also important. This could be a potential secondary indicator to assess longer retention. Measuring and understanding more about patterns of PrEP use over time is better done through more in-depth implementation research or other studies, however.

5.2. Uptake and initiation

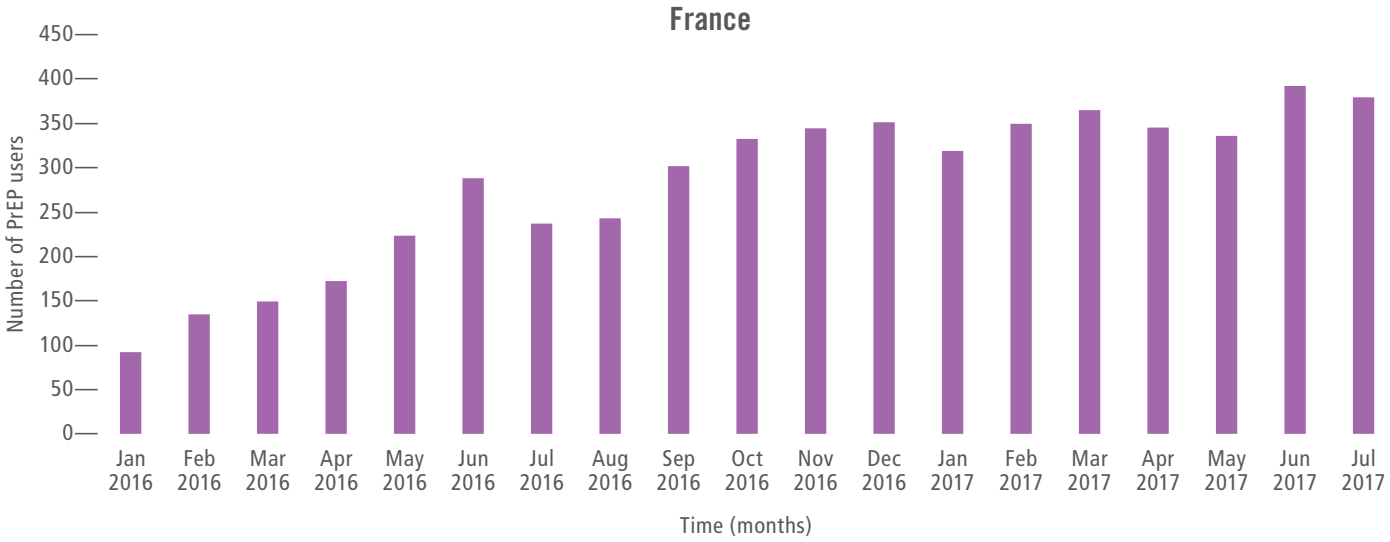
Uptake of PrEP can increase rapidly over time.

Estimations of PrEP uptake are necessary to measure interest among people eligible for PrEP and to forecast drug procurement, inform the supply chain and plan training for future providers. Currently, data on uptake are sparse for many settings, but early indications are that uptake can be low initially. Data from the USA, France and Kenya show that uptake of PrEP can increase rapidly over time as more people begin to use PrEP and demand creation and word-of-mouth increase awareness (Fig. 6). However, uptake often differs by sub-population. For example, early data from Kenya suggests that uptake and continuation may be higher among female sex workers and MSM than among adolescent girls and young women. Therefore, PrEP targets, coverage and estimates of uptake should be revisited annually.

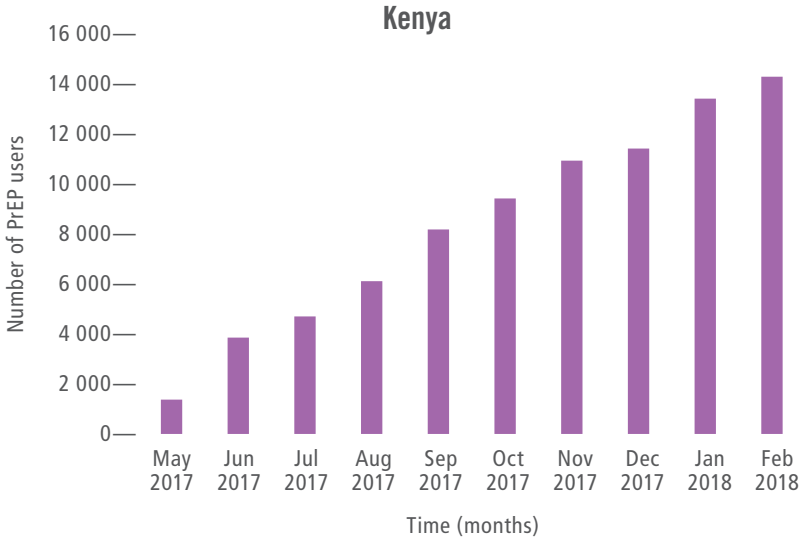
Fig. 6. Number of PrEP users in the United States of America, France and Kenya over time



Source: Sullivan et al. *(15)*



Source: Agence nationale de sécurité du médicament et des produits de santé *(16)*



Source: Ministry of Health, Kenya

5.3. Retention and follow-up

Any drops in retention and loss to follow-up measured through missed appointments should be regularly reviewed at the facility level, and action taken.

Any drops in retention and loss to follow-up measured through missed appointments should be regularly reviewed at the facility level to see if changing approaches to services, such as different or enhanced adherence counselling or contact methods, may help improve retention. Several indicators could feed into an overall measure of retention, taking into account differing patterns of PrEP use. These include indicators of continuation, discontinuation, re-initiation and loss to follow-up. A critical challenge is accuracy. Ideally, it would be better to avoid counting someone as a new initiator who initiated PrEP in a previous reporting period, then discontinued and then re-initiated in a new reporting period. In reality, distinguishing this pattern of PrEP use will be difficult without unique client identifiers.

As far as possible, facilities could measure retention at each of the anticipated time points for follow-up. Early programmes have moved towards less frequent visits for adults – from monthly to quarterly visits – for experienced and adherent PrEP users in order to reduce the burden on both facilities and users. New clients or those re-initiating PrEP may make monthly visits during the first three months after initiation and move to quarterly visits thereafter.

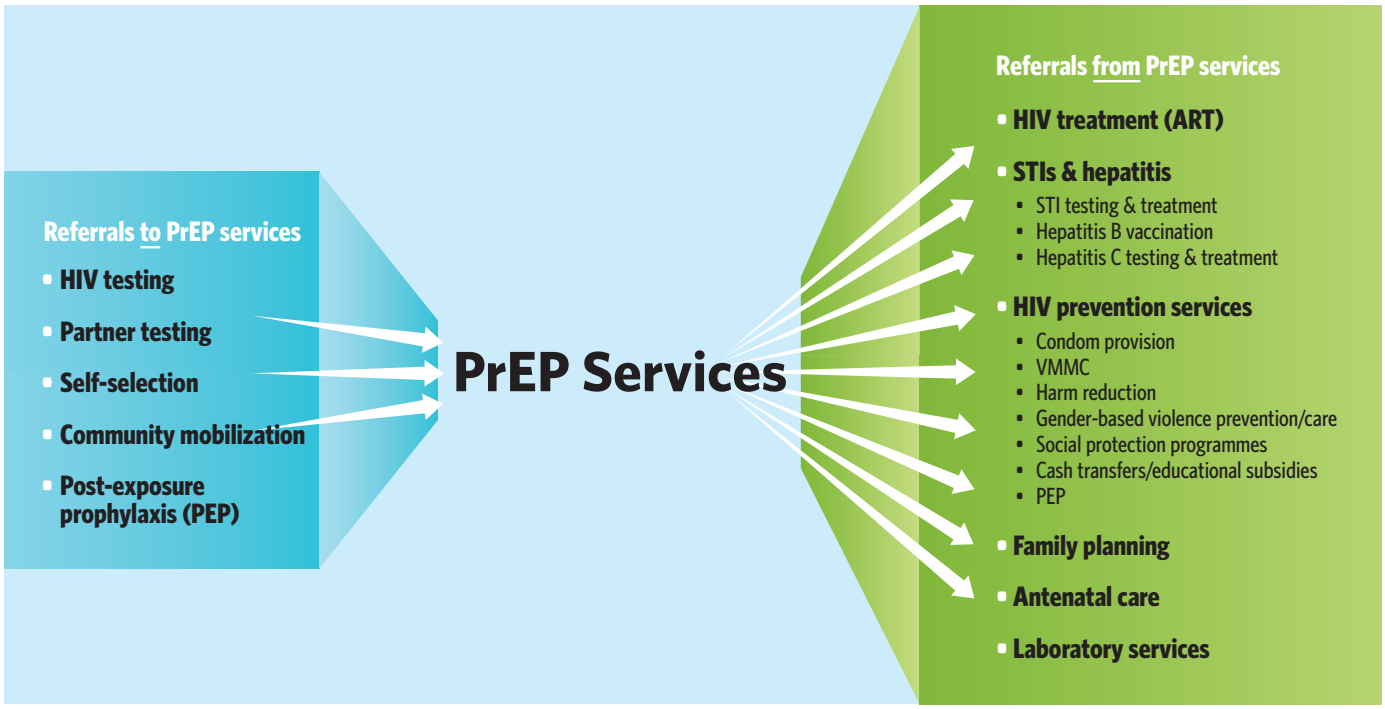
Special considerations are required for adolescents, as randomized clinical trials have shown decreased adherence with less frequent visits *(17, 18)*. To accommodate different visit schedules for younger clients, PrEP registers could allow the flexibility to fill in different visit dates for each user. For example, where the column heading is for visit number and the date is filled in for each user in the row under the columns headed "Visit number N".

5.4. Referrals and linkage

By drawing in people at substantial risk, PrEP services will have a ripple effect on other health services such as HIV testing, treatment, other prevention services and STI screening. The number of HIV tests conducted overall will increase due to both the initial screening for PrEP and the regular testing every three months while someone is taking PrEP. Some people who are interested in taking PrEP may not have obtained testing or other sexual health or health promotion services previously, and they may be diagnosed HIV-positive during initial HIV testing for PrEP eligibility. This may increase the rates of new diagnoses and result in earlier access to ART. Similarly, people whose behavioural risks indicate that they may be candidates for PrEP are likely also to be at risk for other STIs and could be referred for STI screening. Others may be interested in family planning services or voluntary medical male circumcision (VMMC).

Therefore, the downstream effect of PrEP services, particularly once they are scaled up, are likely to be considerable. Capturing the results of these linkages will be difficult, yet it can be important for demonstrating the additional value and cost-effectiveness of providing PrEP. A first step could be to determine which referral and linkage systems exist between these different preventive and treatment services and to develop those that are lacking (see Fig. 8 for example). Next, programmes could develop tools, forms and materials to track referrals and the outcomes of linkages within HIV services (testing, treatment, condom distribution, VMMC, risk reduction and harm reduction) and between HIV services and other health services (STI services, ANC, family planning services, youth-friendly services and others as appropriate). Measuring the *outcome* of a referral, such as the number and proportion registered in a treatment programme for people testing HIV-positive or the proportion screened for an STI, is a far better measure of linkage than simply calculating the proportion of people who were referred.

Fig. 8. Examples of referrals to and from PrEP services whose outcomes could be tracked



5.5. Disaggregations

It is important to disaggregate data on people who are initiating PrEP for the first time from current PrEP users and those who have been prescribed PrEP in the past and have stopped and re-started. This disaggregation makes it possible to track the growth of demand for PrEP and of cyclical PrEP use among experienced PrEP users who start and stop PrEP during periods of high and low risk. The first core indicator, on uptake, described above, includes this disaggregation.

While it is important for routine monitoring to disaggregate PrEP uptake and usage across sex, age and key population categories, protecting confidentiality of these groups and their data is a critical concern, particularly since PrEP will be offered with a focus on groups that are marginalized and criminalized in many settings. Establishing data systems with in-built protections, particularly for electronic records and reporting forms containing individually-identifiable information, will be important both to ensure data security and to foster trust among PrEP users. There may also be overlap between each of these key populations. For example, men who have sex with other men and transgender people may engage in sex work. Therefore all categories that are relevant for an individual should be included. Further, it is important to reassess relevant risk behaviours for key population disaggregation because people's risk behaviors may change over time.

For adolescents and young people, few programmatic data are available due to a number of factors, including broad age disaggregations that combine children and younger adolescents ("<15 years"), on one hand, and older adolescents with adults ("15–49 years"), on the other. Five-year age bands, as in the suggested core indicators and the UNAIDS Global AIDS Monitoring indicator *(19)*, would enable analysis of age-specific gaps. Challenges for adolescents in need of PrEP include legal issues of consent, social and cultural barriers and infrequent utilization of health services. All these influence where and how services may be provided to young people, including services that meet young PrEP users' special needs for information and for adherence and psycho-social support, and how these services are monitored *(20, 21)*.

6. Monitoring toxicity and other adverse outcomes

Monitoring adverse outcomes such as seroconversions, drug-related toxicities and HIV drug resistance in cases of PrEP failure is important for PrEP programmes to ensure the safety of their clients. Monitoring adverse events in most settings would cover people who test HIV-positive after receiving PrEP, non-HIV seroconversion clinical events such as renal issues, and enhanced monitoring of pregnancy and birth outcomes among women who take PrEP during pregnancy.

6.1. Toxicity monitoring

Routine PrEP toxicity monitoring

Many people experience minor symptoms within 2–4 weeks of starting PrEP. These often disappear with time and usually can be managed by counselling prior to and during the early stages of starting PrEP. Monitoring of these mild adverse events could be useful if a PrEP service so decides for patient monitoring at a site level, but likely would not need to be reported to the sub-national or national level.

Serious toxicity prevalence associated with PrEP is expected to be low. However, experience with large-scale PrEP programmes and longer exposure has been limited. Therefore, as PrEP programmes scale up, it will be important to integrate PrEP monitoring with existing routine HIV patient monitoring systems which should capture serious ARV associated toxicities as part of the national health M&E system. With this approach, a minimum set of data elements for reporting on the magnitude of toxicities and their impact on discontinuation or interruption of PrEP can be defined. Routine monitoring tools such as PrEP registers should be used for reporting PrEP-related toxicities. An example of a PrEP user card for monitoring PrEP-limiting toxicity, as adapted from the HIV care and treatment patient card, appears in Fig. 9. National HIV programmes should ensure ARV toxicity data related to PrEP use is communicated and shared with the national pharmacovigilance authority.

Fig. 9. Example of a PrEP user card for monitoring PrEP-limiting toxicity as adapted from the HIV care and treatment patient card *(22)*

Unique No. ☐☐☐☐☐☐ **Name**_____ **Date of birth**_____

PrEP interruptions -- STOP or missed drug pick-up								
Date	/ /	/ /	/ /	/ /	/ /	/ /	/ /	/ /
Why	1							
Date if restart								

Why STOP codes
1 Toxicity/side effects
2 Serve illness, hospitalization
3 Drug out of stock
4 Patient lacks finances
5 Other (specify)

Codes for PrEP limiting toxicity
GI (nausea, diarrhoea, abdominal pain, vomiting)
Skin (rash, hypersensitivity reaction)
Peripheral neuropathy (burning/numbness/tingling)
CNS (dizzy, anxiety, nightmare, depression, seizures)
Hepatic dysfunction (jaundice)
Haematological (anaemia, neutropenia)
Fatigue
Headache
Bone dysfunction (fractures, osteopenia)
Metabolic (body fat changes, hyperglycaemia, dyslipidaemia)
Kidney dysfunction (nephrolithiasis, renal insufficiency)

Date of visit Check if scheduled. Write in alternate pick-up if ill	**Follow-up date**	**Duration in months since first starting PrEP**	**Wt/Ht** Ht at first visit	**Pregnancy / RH-FP choices**	**TB status**	**Hepatitis** information	**PrEP limiting toxicities**/ adverse reactions	**Comorbidities and coinfections** (including STIs, and major NCDs)	Other meds dispensed (including TB/MDR-TB, traditional medicine, nutritional supplements, opioid substitution therapy)	**PrEP**		**Investigations** (record when test requested and results received in relevant visit date rows) **LAB**
										No. missed doses/ Why stop code	PrEP regimen / No. days dispensed	
							H K			1/1		**CrCL**

Active PrEP toxicity monitoring

In addition, active toxicity surveillance through a variety of approaches is recommended to complement routine toxicity monitoring *(23)*. For active reporting, serious adverse drug reactions could be defined as those that lead to the interruption or discontinuation of oral PrEP, such as impaired kidney function, toxicity and other serious side-effects. Programmes providing PrEP could develop stop codes for discontinuing PrEP in order to monitor both the number of discontinuations and the reasons for it. The appendix presents an example of a generic adverse drug reaction reporting form for tenofovir use in PrEP.

Ideally, sentinel cohorts of PrEP users could be established at sites where large numbers of PrEP users are likely to be enrolled. These cohorts should be followed from the first PrEP prescription for as long as is feasible (for example, 1–2 years), including for a defined period after a person stops taking PrEP. Minimizing loss to follow-up would be critical in order to ensure that data are not biased. This is because, when people are lost to follow-up, it will not be known whether the reason the person was lost was associated with PrEP or not. If large numbers of people are lost to follow-up, and much of the loss was due to an outcome such as PrEP drug toxicity, then critical information may be missed. Maintaining high follow-up rates for cohorts of people is costly and often benefits from multiple types and frequencies of contact (for example, face-to-face, phone, text, e-mail, letters). Sites that intend to enroll PrEP cohorts will need to decide what may be most efficient in a given context with the available human resources and develop systems to track individuals and each contact made or attempted. Data management systems could be enhanced in order to optimize data quality, so that summary indicators as well as more detailed information for each PrEP user and reported drug toxicity are captured.

At the site level, any toxicity-associated event should be followed up with standardized clinical management protocols, and data should be reported through pre-defined mechanisms. The analysis of overall rates of drug-associated toxicities should be analysed at the national level, as the frequencies are likely to be too small to have significance at the individual site level. Ultimately, data on drug-related toxicity should be harmonized and pooled from several countries in order to produce evidence at a larger scale.

6.2. Pregnancy and birth defects surveillance

There is no safety-related rationale for disallowing or discontinuing PrEP during pregnancy and breastfeeding for HIV-negative women who are receiving PrEP.

The 2015 and 2016 *WHO consolidated guidelines on the use of antiretroviral drugs for treating and preventing HIV infection (11, 24)* and a technical brief on *preventing HIV during pregnancy and breastfeeding in the context of PrEP (14)* state that there is no safety-related rationale for disallowing or discontinuing PrEP during pregnancy and breastfeeding for HIV-negative women who are receiving PrEP and remain at risk of HIV acquisition. The guidelines conclude that in such situations, the benefits of preventing HIV acquisition in the mother and the accompanying reduced risk of mother-to-child HIV transmission outweigh any potential risks of PrEP, including any risks of fetal and infant exposure to the drugs in PrEP regimens.

The monitoring of HIV status and pregnancy outcomes is a critically important aspect of safety monitoring, both for women who become pregnant while on PrEP or who initiate PrEP while pregnant or breastfeeding and for their infants. Pregnancies exposed to PrEP in any trimester (first, second or third) should be followed. The first trimester is critical to organ development, and additional drug safety data would provide confidence about the level of risk, if any.

Adverse maternal and birth outcomes among pregnancies exposed to PrEP should be collected through active toxicity monitoring, birth defect surveillance and pregnancy registries extended to include 18-month-old infants and mother–infant pairs during breastfeeding. Birth defects are rare events, so birth defect surveillance for PrEP should take cognizance of background rates of birth defects that occur from other causes. In this way the significance of a rare event is placed in appropriate context, rather than appearing to have greater importance when it occurs in a small site with few pregnant women taking PrEP. Existing pregnancy registries and surveillance programmes for congenital abnormalities could be extended to a selection of antenatal clinics where a high number of pregnancies potentially exposed to PrEP are expected. A pregnancy outcome form could be adapted to include PrEP as an exposure and attached to the maternity case record. As with drug toxicities, harmonizing variables and pooling data from several sites and in a global database enables the collection of data to contribute to the global evidence. To this end WHO and the Special Programme for Research and Training in Tropical Diseases (TDR) have established a central registry for epidemiological surveillance of drug safety in pregnancy, with a global database, protocol, reporting tools and training materials to help countries set up surveillance projects with standardized variables (http://www.who.int/tdr/research/tb_hiv/drug-safety-pregnancy/en/). These could be adapted and used for surveillance of adverse drug reactions and monitoring surveillance of pregnancy and birth outcomes associated with PrEP use at sentinel ANC sites, and their use can facilitate pooling of data across countries.

What is new in the ARV drug pregnancy registry and surveillance of congenital anomalies?

- WHO and TDR recently established a global central database for the surveillance of drug safety during pregnancy at antenatal clinics *(25)*. This database provides a list of variables for the surveillance of drug safety and a data dictionary to match the core variables to help countries in establishing surveillance projects with standardized variables and tools. Countries are encouraged to contribute and pool data collected into this database, which was established for the epidemiological surveillance of drug safety in pregnancy.
- There is a data entry programme that any country may use as a data entry interface, or they may export their data from a local electronic database. A user guide to facilitate its use by countries or projects is also available *(25)*.
- A surface examination video is available for training caregivers to conduct a standardized baby examination at birth, including looking for congenital anomalies and taking weight and length measurements *(26)*.

WHO and TDR provide guidance and technical assistance for planning and implementing these surveillance programmes.

Source: Transition to new antiretroviral drugs in HIV programmes: clinical and programmatic considerations Technical update. http://www.who.int/hiv/pub/toolkits/transition-to-new-arv-technical-update/en/.

6.3. HIV drug resistance surveillance

Resistance to tenofovir or emtricitabine (FTC), the drugs used in PrEP, is infrequently observed if PrEP is initiated before HIV exposure. However, incident HIV infection can occur despite adherence to PrEP when individuals are infected with FTC-resistant virus, tenofovir-resistant virus or both *(6)*. HIV drug resistance is likely to occur when PrEP is inadvertently initiated during undiagnosed acute infection. Available data on seroconverters from clinical trials suggest that FTC resistance (M184V/I) occurs more frequently than tenofovir resistance with K65R *(27)*.

As PrEP programmes expand, surveillance is needed for resistance mutations, which may compromise PrEP efficacy and the effectiveness of first-line ART. For individual patient management, countries may consider HIVDR genotyping of all individuals diagnosed with HIV after use of PrEP to guide first-line ART selection, if the capacity to perform the testing and interpret results is available. In countries performing HIVDR testing on all PrEP users, HIVDR data can be aggregated at the national level, and the prevalence and trends of drug resistant virus can be documented. In countries where individual HIVDR testing is not feasible, an alternative surveillance method is required. In this context all individuals diagnosed with HIV while using PrEP should have a dried blood spot specimen made and shipped to a central laboratory following WHO laboratory guidance *(28, 29)*. HIVDR genotyping of dried blood spot specimens from individuals acquiring HIV while on PrEP can be performed annually at one of the WHO-designated laboratories.

7. Programme evaluation and measuring impact

In generalized epidemics the overall impact of PrEP may be limited in many situations. This is because there are many more people who acquire HIV infection in the general population, where incidence is lower (and where identifying those at higher HIV risk may be difficult, and offering PrEP services not cost-effective) than among sub-populations that are offered PrEP. However, it will likely be cost-effective to offer PrEP to people in most settings who are identified to be at substantial risk of HIV acquisition. Measuring the impact of PrEP on outcomes such as community HIV incidence requires large-scale surveys or cohorts, is costly, time-consuming and may not be a high-priority use of scarce resources.

Despite these challenges, PrEP may be shown to have a measurable effect on related indicators such as the number of new cases of HIV detected among the sub-populations who use PrEP. Although this is not a true measure of incidence, this type of HIV-case surveillance, measured through the PrEP cascade, may provide an estimate of impact. This may be particularly true where the majority of new infections occur in these sub-populations and in concentrated epidemics. Early examples from London, UK *(30, 31)* and New South Wales, Australia *(32)*, show decreasing numbers of new infections reported over time after PrEP became available (Fig. 10). In the UK, although declines in new infections are seen in other populations as well, the decrease in London where PrEP access has been greater is very marked. Although these are ecological data and the decrease cannot be definitively ascribed to PrEP without an appropriate evaluation design and analysis, the trends do point in a positive direction.

To measure programme effectiveness, programme evaluations ideally are designed before a programme is implemented so that changes that occur can be more accurately compared with periods or places without the intervention. Often, this is difficult in practice. PrEP, which is in the early phases of implementation in most places, offers an opportunity to build in evaluation from the beginning, during phased implementation.

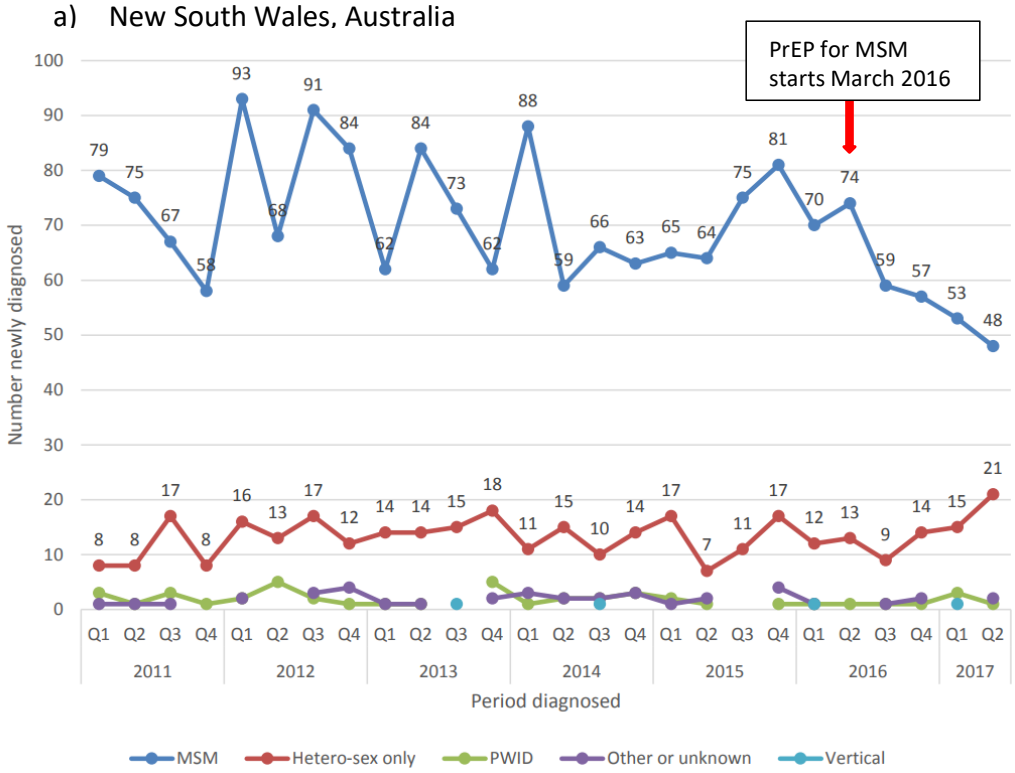
Evaluations can also be conducted for ongoing programmes and should be conducted periodically for all programmes to ensure that their intended purpose continues to be met and to identify strengths and weaknesses. Different types of evaluation include:

- formative work to assess feasibility and acceptability;
- process monitoring through systematic and routine documentation of key aspects of performance;
- outcome evaluations that measure the factor or health condition in the priority population that the programme is expected to change; and
- impact evaluations, which determine the impact of a programme by comparing it with an estimate of what would have occurred in its absence.

Gathering key stakeholders to identify and formulate evaluation questions will focus the evaluation on the areas of programme performance that are important for decision-makers. These may include assessing who is reached, why people choose to continue or stop PrEP, which priority groups may be underrepresented, and changes in risk/protective behaviour of consumers or providers. Fig. 11 provides some examples.

Fig. 10. Number of newly diagnosed HIV cases in a) New South Wales, Australia, and b) London, the United Kingdom, over time

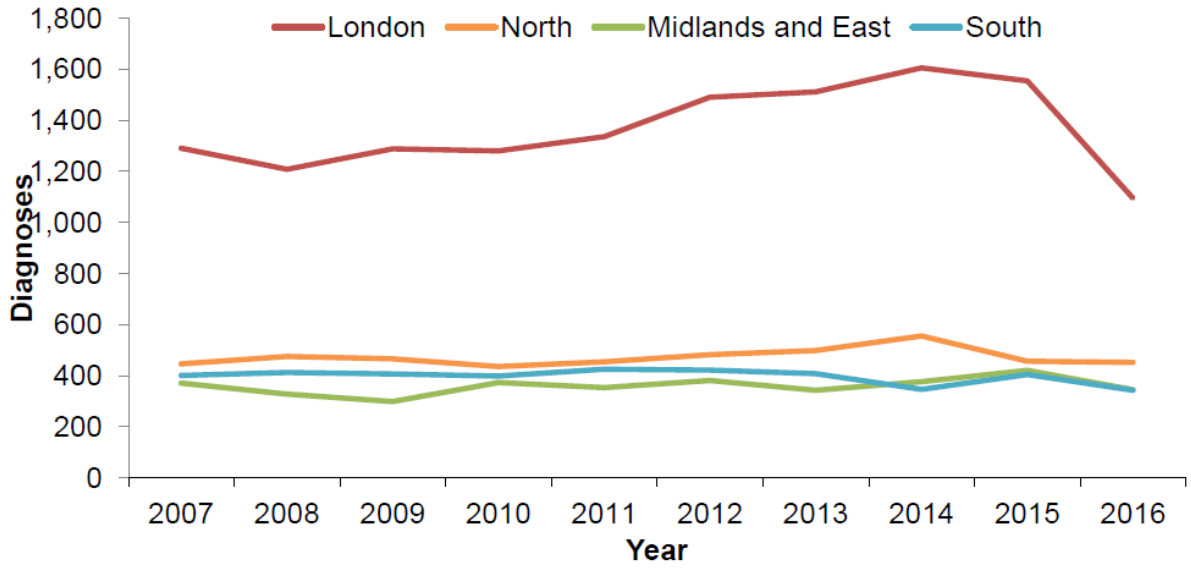
a) New South Wales, Australia



Note: MSM=men who have sex with men; PWID=people who inject drugs

Source: Grulich et al. *(32)*

b) United Kingdom gay and bisexual men by region



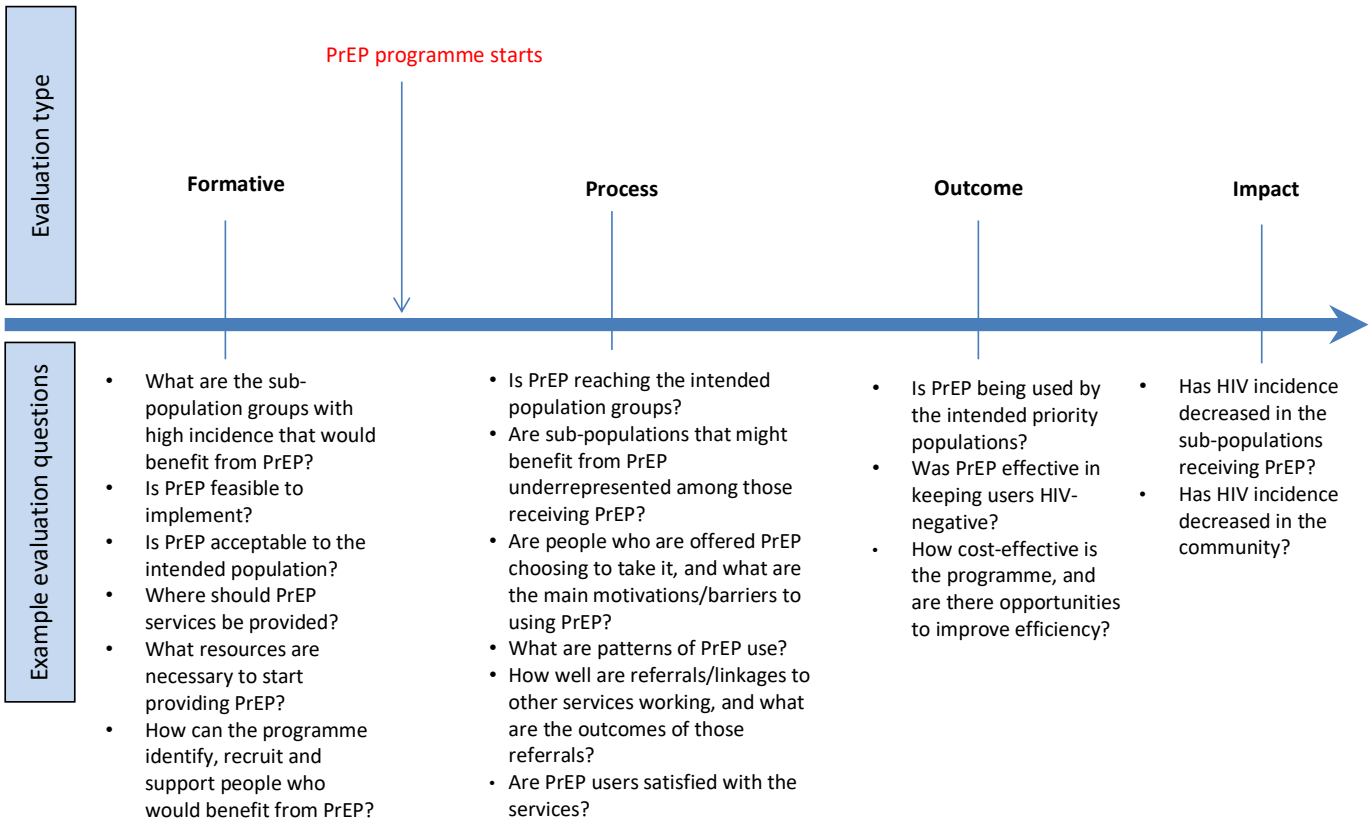
Source: Public Health England *(30)*

Developing M&E procedures is important to ensure that programmes track progress and, using this information, improve performance.

One of the critical components of whether people choose to use PrEP or another HIV prevention tool is their perception of their own risk. People who perceive themselves to be at risk and seek out PrEP are likely to benefit from it. Others who are unaware of, or who think they are not at risk, are unlikely to take action to protect themselves from HIV. Risk assessments, measures of sexual behaviour and open conversations between providers and potential users may help to improve risk perception. Programme evaluations could assess whether chosen approaches successfully alter perceptions and improve enrolment. Other evaluations could follow those who choose not to take PrEP, assessing any changes in their sexual behaviour and whether they subsequently test HIV-positive. Such information could inform programmatic changes to increase appropriate uptake and continuation on PrEP.

In conclusion, as PrEP programmes are implemented and begin to scale up in a phased manner, developing standardized procedures for monitoring, reporting, referral, and linkage with regular analysis is important to ensure that programmes appropriately track and measure their progress, and, using this information, improve their performance. Evaluation components developed at the beginning, if possible, and integrated throughout the cycle of a programme will provide deeper insights into whether intended objectives are being met and will enhance the quality of services in the long run. Providing regular feedback and the results of evaluations to sites, providers and referral facilities will encourage improvement and foster stronger linkages among health services. Ultimately, in regions of high prevalence and in services for key populations, the goal of helping to reduce HIV transmission will be met once potential PrEP users can access services easily, choose to start and stop PrEP as appropriate and remain HIV-negative.

Fig. 11. Example of evaluation questions for PrEP programmes



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Appendix: Example of PrEP adverse drug reaction reporting form

ADVERSE DRUG REACTION REPORTING FORM FOR TENOFOVIR USE IN PrEP

(This form is to be adapted/used within national HIV programme and targeted PrEP toxicity monitoring)

Information will be kept confidential

Name of facility:	**Code of reporting site:** **Code of reporting form designed by ADR centre:**

Patient ID:..... **DOB:**...../...../.....

Gender: ☐ **Male** ☐ **Female** ☐ **TG** **Weight:**.....**(kg)** **Height:**.....**(cm)**

Case ID number:.....

Active TB: ☐ **Yes** (*Date of diagnosis: ..../...../....)* ☐ **No** **Pregnancy:** ☐ **Yes** ☐ **No** ☐ **Don't know**

If pregnant: Date of LMP: ...../...../..... **Gestation week at PrEP initiation: ..... (weeks)**

Indication for TDF use:

☐ **Oral pre-exposure prophylaxis (PrEP)**

PrEP ARVs OR CONCOMITANT DRUGS AT TIME OF ADR ONSET

PrEP ARVs prescribed	Dose	Start date	End date

Other medicines	Dose	Start date	End date

ADVERSE DRUG REACTIONS

Start date ADR:...../...../..... **End date ADR:**...../...../..... ☐ **Ongoing**

RENAL DYSFUNCTION EVENTS:

Test results before using TDR:

Serum Creatinin:.....(mol/L)

Date: ...../...../.....

Urine protein; ☐ **Positive** ☐ **Negative** ☐ **Not test**

Date: ...../...../.....

Test results after using TDR:

Serum Creatinin:.....(mol/L)

Date: ...../...../.....

Urine protein: ☐ **Positive** ☐ **Negative** ☐ **Not test**

Date: ...../...../.....

OTHER EVENTS:

☐ **Skin rash/hypersensitivity reaction**

☐ **GI (nausea, diarrhoea, abdominal pain, vomiting)**

☐ **Elevated ALT/AST (hepatotoxicity)**

☐ **Bone dysfunction (fractures, osteopenia)**

☐ **Other (specify):**.....

.....

Complementary lab test results at the time of ADR (if available):

ALT:.....(µmol/L)

AST:.....(µmol/L)

☐ **Other (specify):**.....

.....

COMORBIDITIES	
Occurrence of any opportunistic disease after the onset of PrEP? ☐ **Yes** ☐ **No** **If YES, check and/or describe:** ☐ **Tuberculosis** (*Date of diagnosis: ...../...../.....)* ☐ **STI syndromes (select all that apply):** **U=Urethral discharge/G=Genital ulcers/** **V=Vaginal discharge/L=Lower abdonominal pain/** **S=Scrotoal swelling/I=Inguinal bubo/O=Other-(specify)** **.....**	☐ **Diabetes** ☐ **Cardiovascular disease** ☐ **Hepatitis B** ☐ **Hepatitis C** ☐ **Renal insuficiency (acute or chronic)** ☐ **Hepatic insufficiency** ☐ **Mental disease (specify):.....** ☐ **Other (specify):.....** **.....**
ADR management: ☐ **Dose adjustment** ☐ **Stop PrEP** ☐ **Other drug used to manage ADR (specify):.....** ☐ **Other (specify).....**	
If PreP discontinued, HIV status at the time of discontinuation: ☐ **Negative** ☐ **Positive** ☐ **Unknown**	

Seriousness of the ADR			
☐ Death	☐ Requires or prolongs hospitalization	☐ Congenital anomaly/birth defect	
☐ Life-threatening	☐ Disability or permanent damage	☐ Not serious	
Results after ADR treatment			
☐ Died due to ADR	☐ Not yet recovering	☐ Recovered with sequelae	☐ Unknown
☐ Died not due to ADR	☐ Recovering	☐ Recovered without sequelae	
Completed by:		**Title:**	
Email:		**Telephone:**	
Signature:.....		**Date of reporting**...../...../.....	

Please report even if:
You are not certain the product caused the event OR you don't have all the details

Person report:
Doctor, pharmacist, nurse

Time to report:
All reporting forms should be completed as soon as possible and sent to XXX by day XX every month. The designated staff will enter the xxxx every month.

Who to send:

Name: Tel: Fax: Email:

For more information contact:

Name: Tel: Fax: Email:

For more information, contact:

World Health Organization
Department of HIV/AIDS
20, avenue Appia
1211 Geneva 27
Switzerland

E-mail: hiv-aids@who.int

www.who.int/hiv