HIV Learning Network
The CQUIN Project for Differentiated Service Delivery

World Health Organization

icap Global Health

Optimizing HIV testing through routine use of data: a call for HTS evidence-based decision making

Céline Lastrucci, technical officer, WHO HIV Testing Services (HTS) Team

Leveraging DSD Strategies to Optimize HIV Testing and Linkage Services

March 13-16, 2023 | Nairobi, Kenya

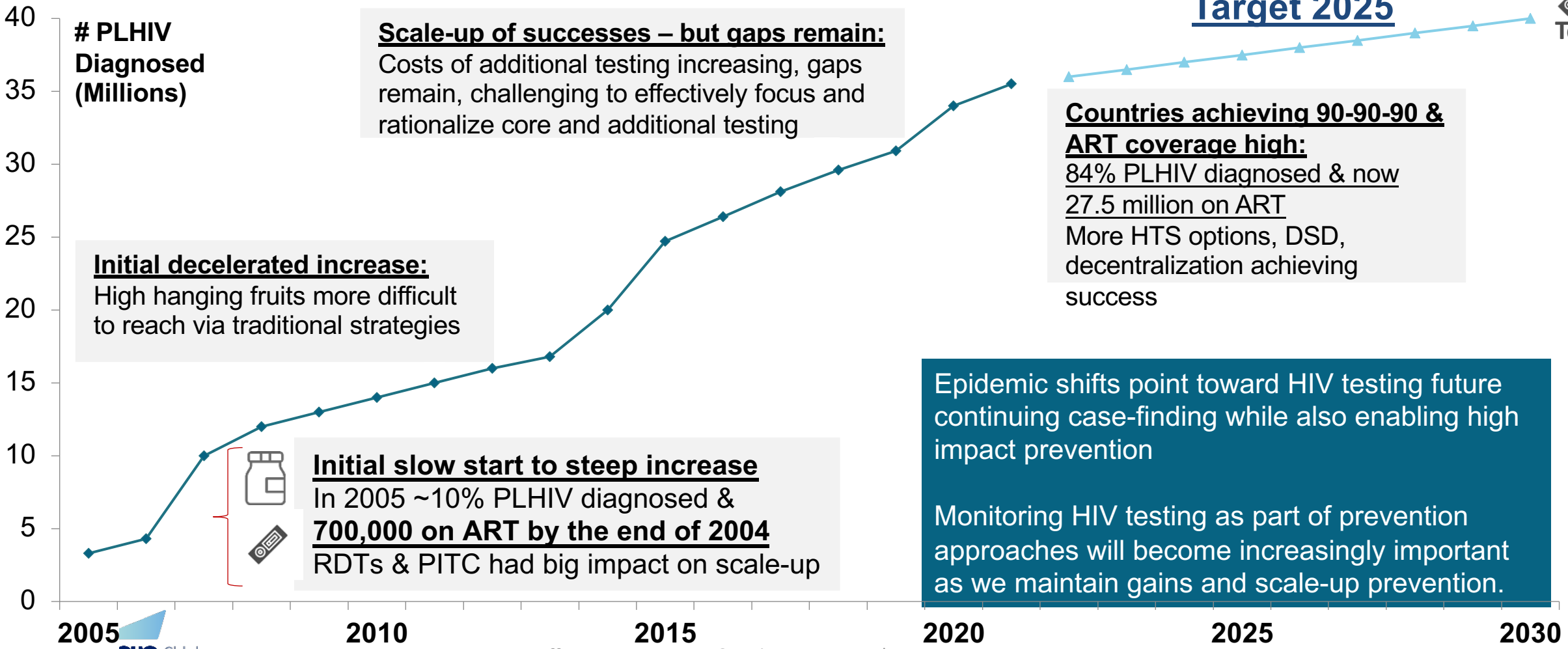
Outline of the presentation

1. Global HTS update
2. Strategic planning, optimizing and monitoring HTS program
   - Guiding principles and core indicators for HTS
   - Know your epidemic: identify who is missing
     - Geographical difference
     - Population difference
   - Regular review your programmatic data: identify efficient models and monitor
     - Set your target
     - Monitor your results
     - Adjust your program
3. Conclusion

Progress toward global HIV testing targets

World Health Organization

We have made progress:



Scale-up of successes – but gaps remain:
Costs of additional testing increasing, gaps remain, challenging to effectively focus and rationalize core and additional testing

Initial decelerated increase:
High hanging fruits more difficult to reach via traditional strategies

Initial slow start to steep increase
In 2005 ~10% PLHIV diagnosed &
700,000 on ART by the end of 2004
RDTs & PITC had big impact on scale-up

Countries achieving 90-90-90 & ART coverage high:
84% PLHIV diagnosed & now 27.5 million on ART
More HTS options, DSD, decentralization achieving success

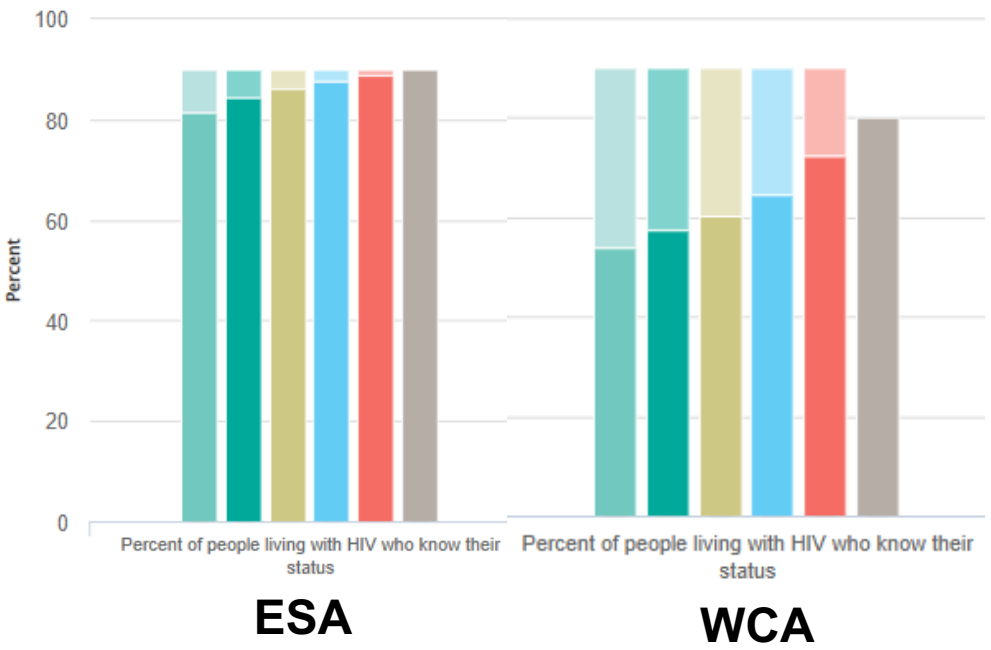
Epidemic shifts point toward HIV testing future continuing case-finding while also enabling high impact prevention

Monitoring HIV testing as part of prevention approaches will become increasingly important as we maintain gains and scale-up prevention.

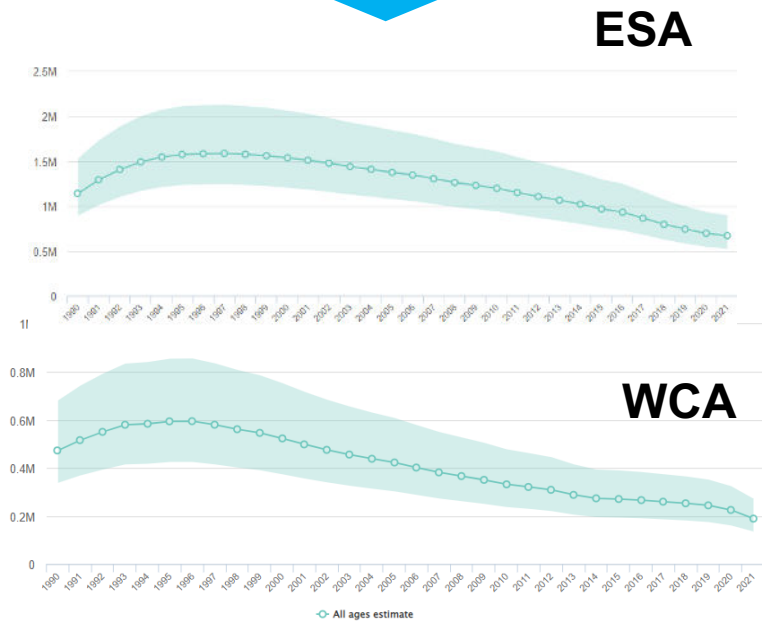
Source: WHO forecast 2020; UNAIDS 2022; WHO 2005; CHAI 2015; WHO, UNICEF, PEPFAR, GFTAM 2018

Large gaps remain and HTS needs to be prioritised to achieve 95-95-95 and prevention goals in SSA

10-20% of all PLHIV remain undiagnosed



HIV infections not declining swiftly, 860,000 new infections annually



Who are HTS programmes missing?

- **Key populations (KP) and their partners/contacts**
- **Adult men**
- **AGYW**
- **Partners of PLHIV**
- **STI patients**
- **LTFU clients needing re-engagement**

***Highest transmission age group: men 25-39 years & 75% of transmitters infected >1 year (Fraser 2022, Popart AIDS 2022)**

UNAIDS 2022; WHO 2019, Maheu-Giroux 2021: https://www.thelancet.com/journals/lanhiv/article/PIIS2352-3018(20)30315-5/fulltext; Eaton AIDS 2022

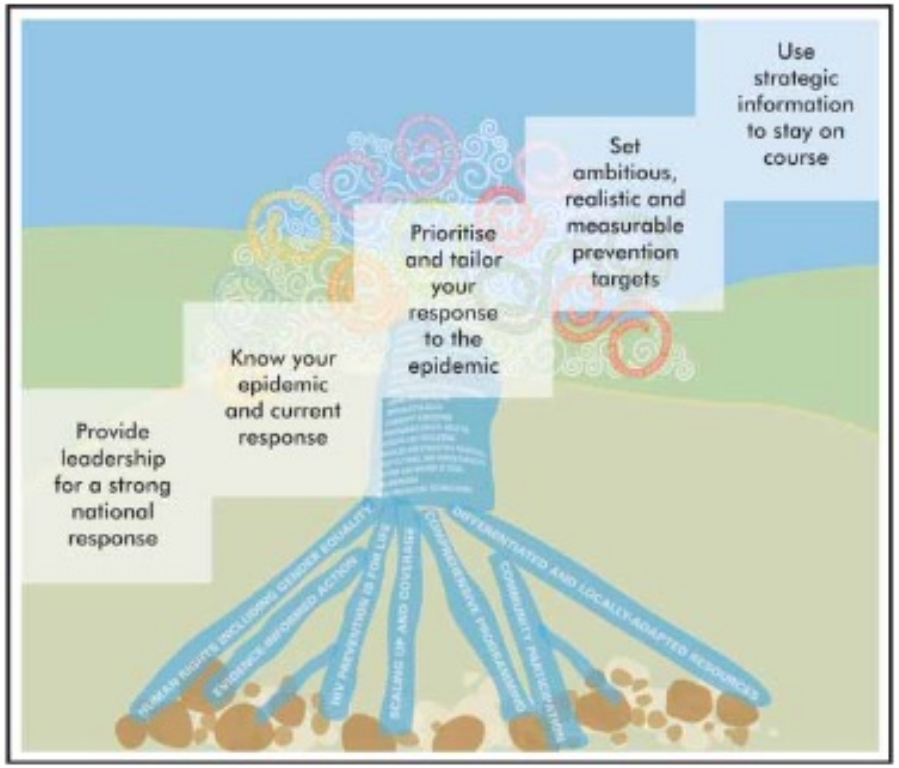
Reaching the ones missing: Optimizing HTS programs

World Health Organization

Precision Public Health: A familiar paradigm to the HIV response

UNAIDS 2007 "Towards Universal Access"

KNOW YOUR EPIDEMIC AND YOUR CURRENT RESPONSE



GLOBAL AIDS STRATEGY 2021-2026
END INEQUALITIES.
END AIDS.

"Recognizing that **'one size does not fit all'**, the Strategy prioritizes tailoring of **differentiated service packages** and service delivery approaches to the **unique needs of people, communities and locations**, using **granular data** to focus programmes most effectively"

Jeffrey W Eaton, AIDS 2022

Strategic planning for effective and efficient HIV Testing Services ½

World Health Organization

STRATEGIC PLANNING FOR EFFECTIVE AND EFFICIENT HIV TESTING SERVICES 7

Box 7.1. Guiding principles for planning HTS

For any HTS, service delivery models and approaches should focus on:

1. reaching the **largest number of people with HIV who remain undiagnosed** and reaching the **population groups with higher HIV risk where the gap in knowledge of HIV status is greatest;**
2. **increasing acceptability, equity and demand** for HTS to reach those left behind, including key populations;
3. **prioritizing approaches** that are most cost-effective and efficient;
4. achieving **national programme targets** (for example, the 90–90–90 targets and the fast-track prevention targets);
5. **facilitating linkage** to treatment for individuals who are diagnosed HIV-positive and providing appropriately tailored prevention for those who test HIV-negative.

Source: WHO, 2018 *(10)*.

An in-depth situational analysis is a critical first step!

Table 7.2. HTS approaches to consider for selected priority populations

Priority population	Facility-based	Community-based	HIV self-testing	Social network-based testing for key populations
Key populations	Routine in all facilities and testing sites serving key populations	Mobile or outreach testing for key populations in all settings	Offer in all settings	Offer to partners and social contacts of HIV-positive, and, if at ongoing risk, HIV-negative, members of key populations
Men	Routine in high HIV burden settings Focused in other settings, for example, indicator condition- or risk-based	Workplace testing in high burden settings	Peer distribution or distribution to male partners by antenatal care (ANC) clients in high burden settings	Offer to social contacts of men who have sex with men
Adolescents and young adults (ages 15–24 years)	Routine in high HIV burden settings Focused in other settings, for example, indicator condition- or risk-based	In high HIV burden offer in settings such as schools, other educational institution or sports festivals	Online distribution via social media in high burden settings; can be considered in facilities where testing may not routinely offered (i.e. family planning clinics) or as part of focused key populations outreach.	Offer to youth from key populations who test HIV-positive or HIV-negative

Table 7.4. HIV testing data and sources relevant to HTS situational analysis

Indicator	Data source(s)	Disaggregation	Use
HIV testing services data			
HIV prevalence (and/or HIV incidence)	Multiple sources can be used; consider triangulation. Possible sources: national population-based surveys; ANC surveillance data; programme data; special studies or projects among key populations; modelling exercises (for example, the UNAIDS Spectrum AIDS Impact Model (AIM))	National and subnational; sex and age group (5-year age groups or at least <15 and >15 years); pregnant women attending ANC; key population; other vulnerable and priority populations such as STI and TB patients	To quantify HIV burden in different geographies, demographics and populations
Number/ proportion of people with HIV who know their HIV status	National population-based surveys; programme data	National and subnational; sex and age group; key population; other vulnerable and priority populations	To understand HIV testing coverage gaps in different geographies, demographics and populations.

Consolidated guidelines on HIV testing services for a changing epidemic (who.int)

Strategic planning for effective and efficient HIV Testing Services 2/2

World Health Organization

STRATEGIC PLANNING FOR EFFECTIVE AND EFFICIENT HIV TESTING SERVICES 7

Core indicators and data for HTS planning

- PLHIV who know their HIV status (GF; GAM; WHO and for KP: GAM; WHO)
- Late HIV diagnosis (GAM)
- HIV testing volume and positivity by age/sex and modality, including self-testing (GF HTS; GAM; WHO)
- Linkage to ART (GF; WHO)
- HTS index testing and partner notification (WHO)
- HIV self-testing - % of people who have tested for HIV using a self-test kit (DHS)
- HIV retest at ART start - % of new ART patients who were retested to verify diagnosis (site-level)
- Treatment adjusted prevalence – (adults with HIV- adults with HIV receiving ART) / total adult population.

Consider community-led monitoring and approaches for quality of care

An in-depth situational analysis is a critical first step!

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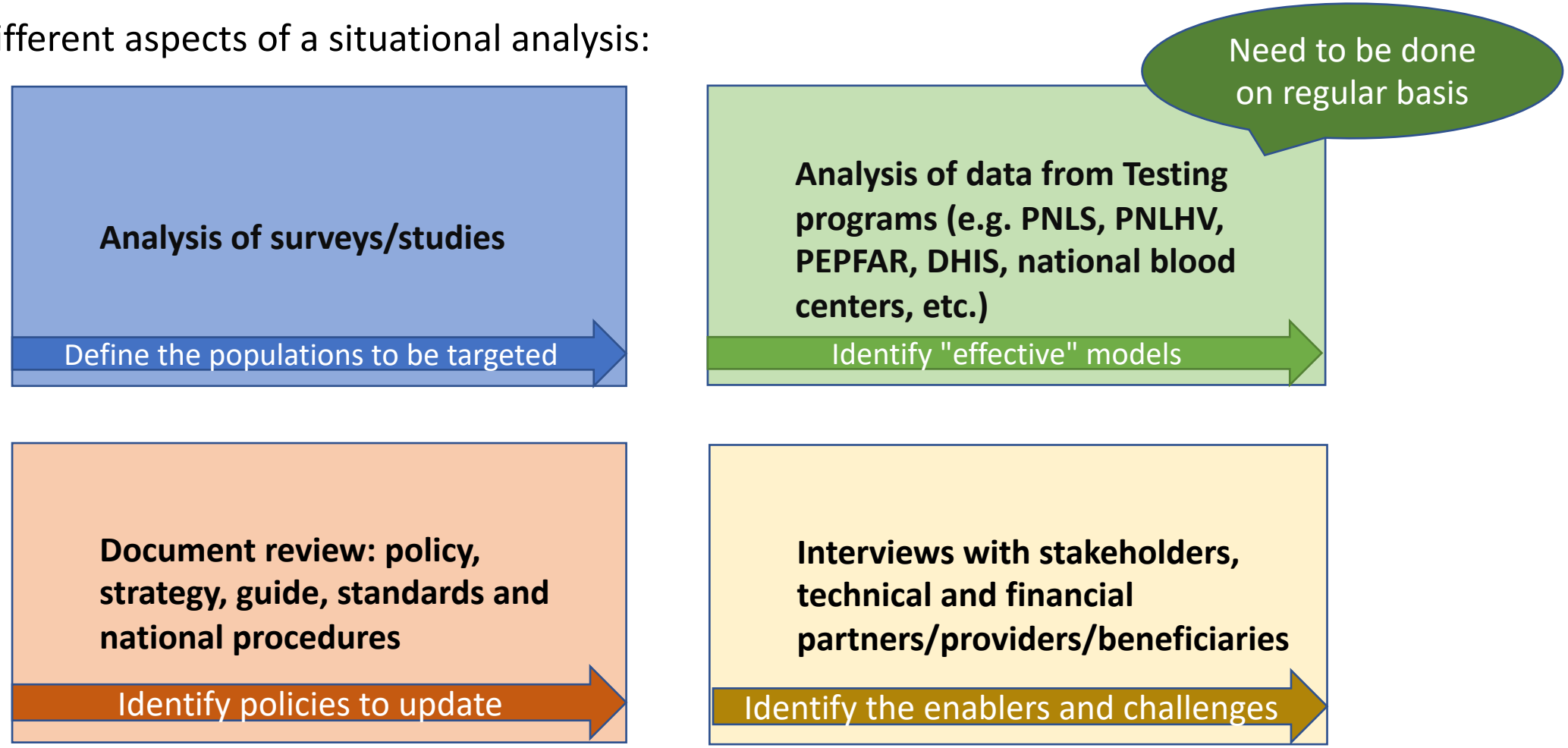
Consolidated guidelines on HIV testing services for a changing epidemic (who.int); Consolidated guidelines on person-centred HIV strategic information: strengthening routine data for impact (who.int)

HTS Situational analysis

The different aspects of a situational analysis:



A closer look at treatment adjusted prevalence: An example from Nyanza, Kenya

As we approach the 1st 95, overall national prevalence is not the best indicator to monitor anymore: Treatment adjusted prevalence is more representative

Policy & practice

Treatment-adjusted prevalence to assess HIV testing programmes

Beth A Tippett Barr,[a] David Lowrance,[b] Cheryl Case Johnson,[b] Rachel Clare Baggaley,[b] John H Rogers,[c] Shirish K Balachandra,[c] Joseph Barker,[a] Thokozani Kalua,[d] Sudhir Bunga,[e] Daniel Low-Beer,[b] Danielle Payne,[f] Marc G Bulterys[a] & Andreas Jahn[g]

Abstract Scale-up of human immunodeficiency virus (HIV) testing and antiretroviral therapy (ART) for people living with HIV has been increasing in sub-Saharan Africa. As a result, areas with high HIV prevalence are finding a declining proportion of people testing positive in their national testing programmes. In eastern and southern Africa, where there are settings with adult HIV prevalence of 12% and above, the positivity from national HIV testing services has dropped to below 5%. Identifying those in need of ART is therefore becoming more costly for national HIV programmes. Annual target-setting assumes that national testing positivity rates approximate that of population prevalence. This assumption has generated an increased focus on testing approaches which achieve higher rates of HIV positivity. This trend is a departure from the provider-initiated testing and counselling strategy used early in the global HIV response. We discuss a new indicator, treatment-adjusted prevalence, that countries can use as a practical benchmark for estimating the expected adult positivity in a testing programme when accounting for both national HIV prevalence and ART coverage. The indicator is calculated by removing those people receiving ART from the numerator and denominator of HIV prevalence. Treatment-adjusted prevalence can be readily estimated from existing programme data and population estimates, and in 2019, was added to the World Health Organization guidelines for HIV testing and strategic information. Using country examples from Kenya, Malawi, South Sudan and Zimbabwe we illustrate how to apply this indicator and we discuss the potential public health implications of its use from the national to facility level.

Abstracts in عربي, 中文, Français, Русский and Español at the end of each article.

Introduction

Globally, there has been substantial scale-up of human immunodeficiency virus (HIV) testing services and antiretroviral therapy (ART), and it is now estimated that 78% (16 million) of the 20.6 million people living with HIV in eastern and southern Africa are receiving treatment.[1] As a result, countries or districts with high HIV prevalence in sub-Saharan Africa are now finding a decline in positivity (that is, the proportion of people tested who are positive) in their national HIV testing programmes.[2–5] For example, an analysis of over 15 million tests conducted primarily in health facilities in Kenya between July 2017 and June 2018 found that only 1.4% were positive.[4] This figure compares with a national HIV prevalence in adults of 4.5% (1 390 000 people in the population of 30 888 880) in 2019.[1] In seven out of 10 African nations with adult HIV prevalence of 10% and above, the positivity from the national HIV testing programme has been reported as 5% or below.[2] In Malawi, for example, the proportion of people found to be HIV positive in national testing services has declined from 13.0% (170 040) of 1 304 707 people tested in 2008 to 3.1% (139 702) of 4 474 393 people in 2018, while the annual number of tests conducted has tripled (Fig. 1; A Jahn, Ministry of Health, Malawi, unpublished data, 2020). Over the same period, the estimated proportion of people living with HIV who were receiving ART increased from 14.3% (143 350 of 1 000 000 people) to 76.9% (769 179 of 1 000 000 people).[6]

This trend is encouraging, as it signals rapid progression towards the global 95–95–95 goals for reducing HIV-associated mortality and achieving and sustaining low HIV incidence.[7] Nevertheless, as more people living with HIV are diagnosed and access treatment, finding people with undiagnosed HIV becomes progressively more difficult and expensive.[2] Provider-initiated testing and counselling approaches were recommended by the World Health Organization (WHO) in 2007.[8] At that time, positivity in national HIV testing programmes either reflected the prevalence in the general population, such as healthy women attending antenatal clinics, or the much higher prevalence in those attending tuberculosis or sexually transmitted disease services.

In this article we discuss the use of a new indicator, which we named treatment-adjusted prevalence. The indicator serves as a practical benchmark for the expected yield of HIV positivity in an adult testing programme when accounting for both national HIV prevalence and ART coverage. We chose the label treatment-adjusted over status awareness-adjusted as it is the aim of HIV programming to achieve virtual elimination of disease, and it is only once ART is initiated that viral load declines and onward transmission decreases.[9] By explaining the application of this indicator with examples from sub-Saharan Africa, we hope to promote its use by national programmes and implementing organizations at subnational level.

[a] US Centers for Disease Control and Prevention, Center for Global Health, PO Box 606, Village Market, 00621 Nairobi, Kenya.
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[c] US Centers for Disease Control and Prevention, Division of Global HIV & Tuberculosis, Zimbabwe.
[d] Ministry of Health, Department of HIV/AIDS, Lilongwe, Malawi.
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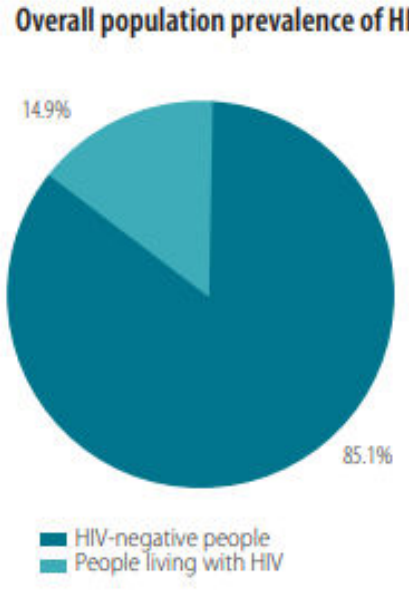
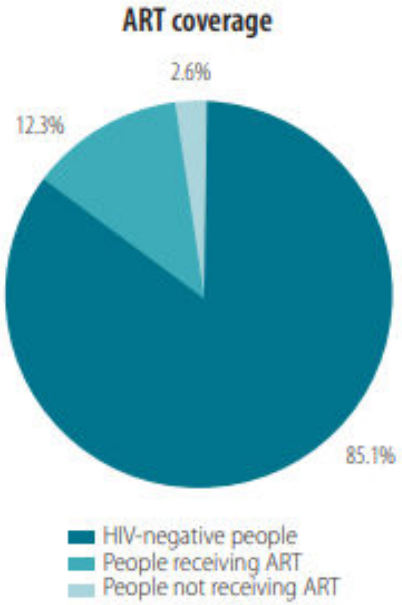
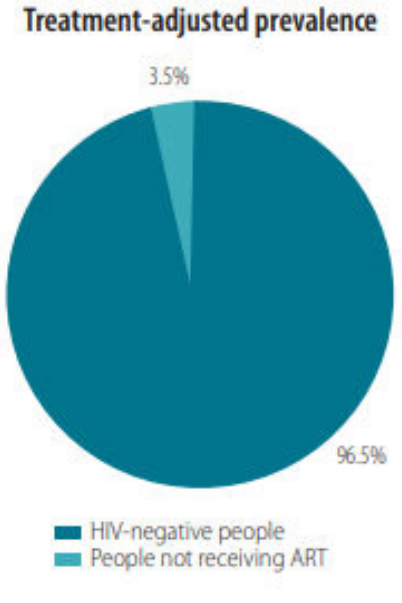
[f] US Centers for Disease Control and Prevention, Division of Global HIV & Tuberculosis, Lilongwe, Malawi.
[g] International Training and Education Center for Health (I-TECH), University of Washington, Seattle, United States of America.
Correspondence to Beth A Tippett Barr (email: hiv3@cdc.gov).
(Submitted: 12 May 2021 – Revised version received: 3 September 2021 – Accepted: 3 September 2021 – Published online: 30 September 2021)



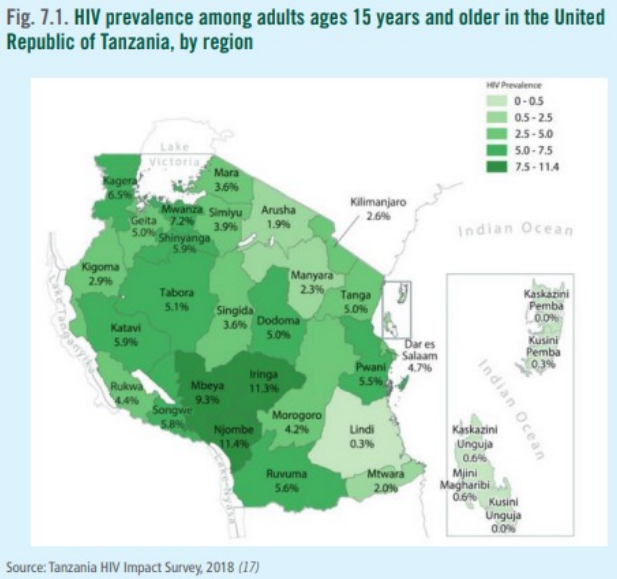




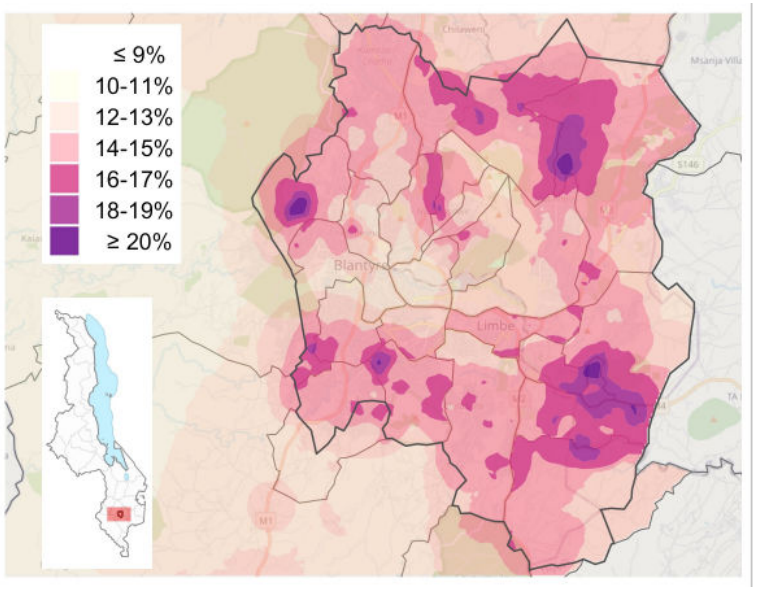
HTS positivity in this same period was 1% in Kenya

Source: Barr 2021,, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8640683/pdf/BLT.21.286388.pdf

Understanding geographic variations within countries

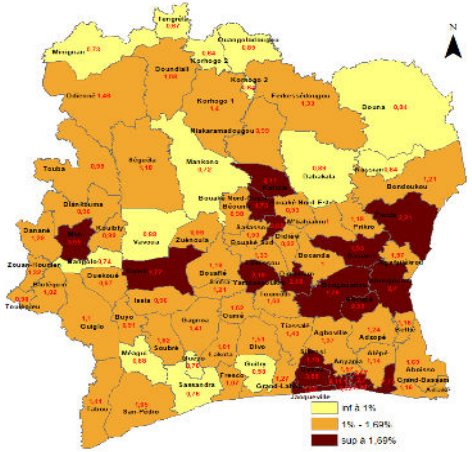


HIV prevalence variation is wide across Tanzania 11.4% in Njombe and 0.3% in Linde

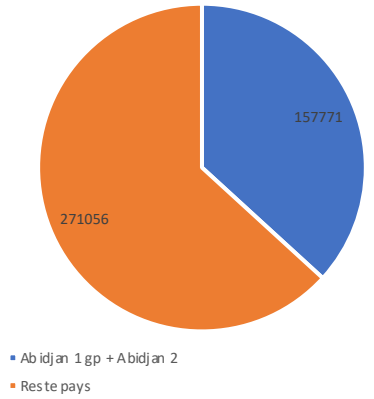


Across wards on Blantyre City (southern Malawi), HIV prevalence ranged between **13%** and **19.5%**

HIV prevalence >15 years old in ivory coast, Spectrum 2020



Location of PVVIH
Source, Spectrum 2020: Naomi



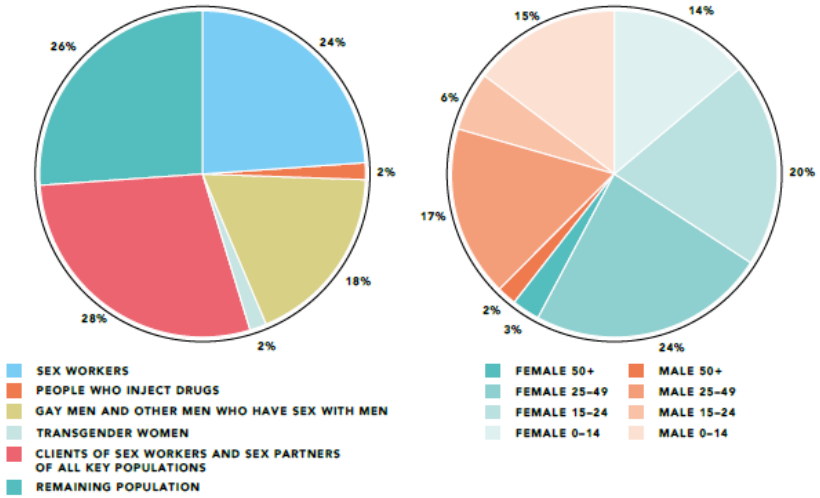
Ivory Coast:
Prevalence varies by regions (<1% to >1.69%)
37% of PLHIV are from 2 regions / 20 : Abidjan 1 gp and Abidjan gp 2

Source: TPHIA 2017; Burke 2022; Eaton 2022; CIV rapid HTS situational analysis, Spectrum 2020

Understanding population differences within countries

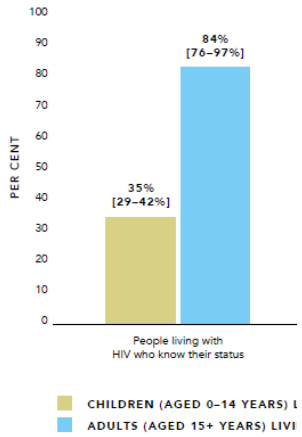
WCA:

- **Distribution of new infection by population:**



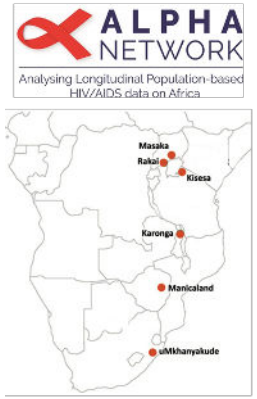
74% of new infections are among KP and their partners

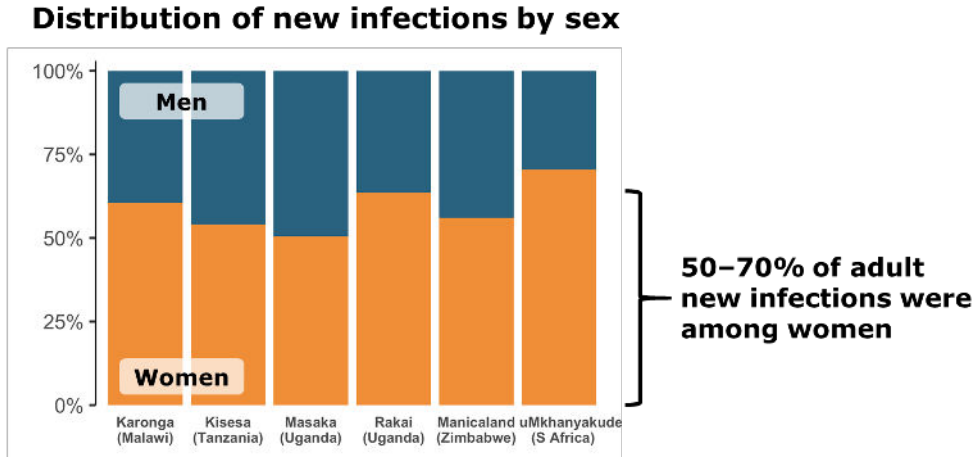
- **Kowledge of status by age:**



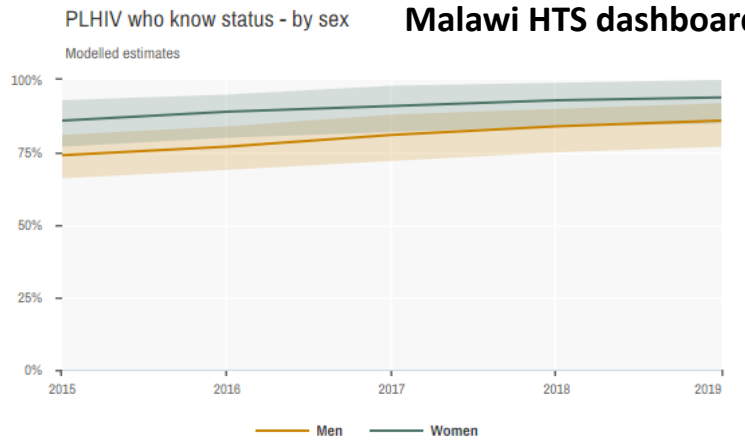
Only 35% of children (0-14 years old) know their status

ESA:





Malawi HTS dashboard

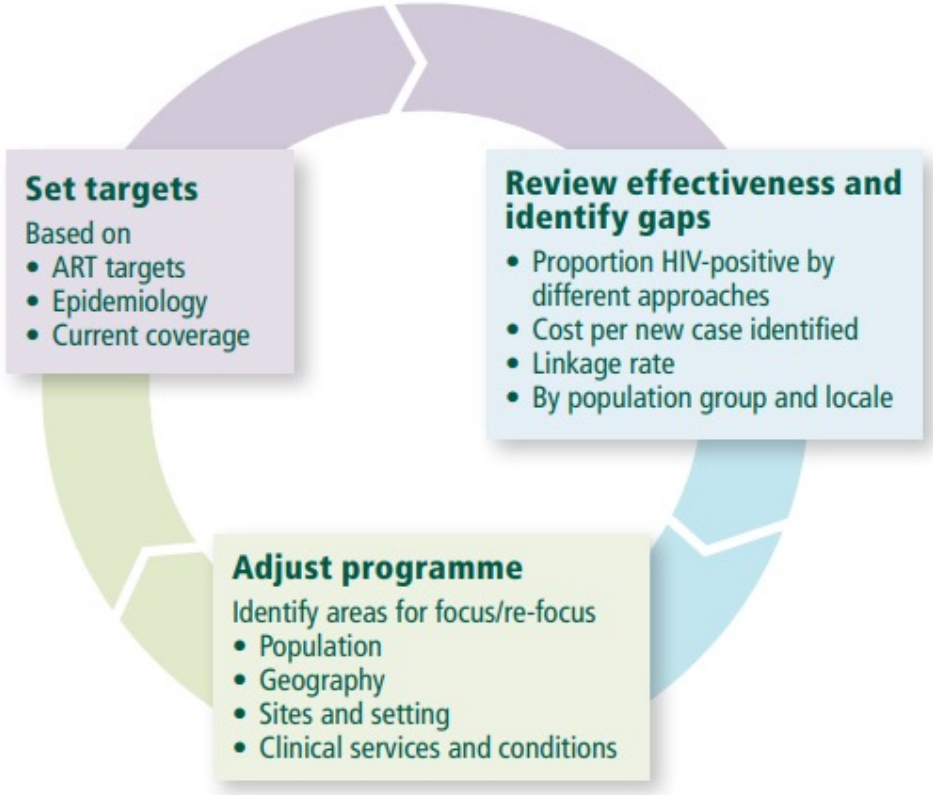


Knowledge of HIV status in women > men

Source: *UNAIDS, special analysis 2022,* Risher *et al. Lancet HIV* 2021. 8:E429-39, WHO HTS Dashboard

Review data routinely to optimize programming

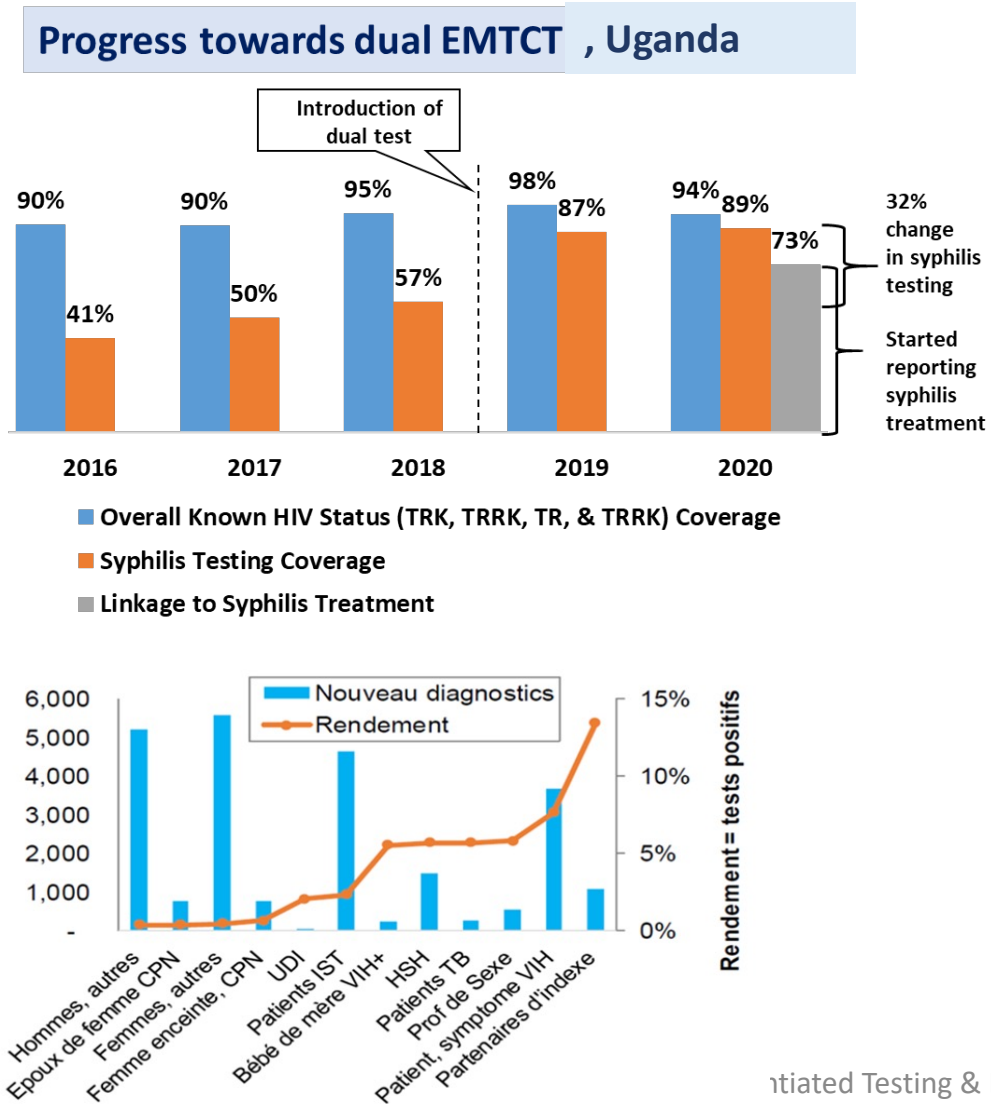
- Set targets: realistic, based on epidemiology and current coverage
- Review data, analyse trends
  - Ideally at least quarterly and to closely monitor new HTS approaches
  - Look at linkage and engagement/reengagement: Considerations for prevention monitoring – uptake of PrEP
  - Use data triangulation to measure impact (HIV-ST)
- Adjust program regularly; identify areas for focus and refocus: where? Whom? identify what to scale up, what to modify and what to stop;



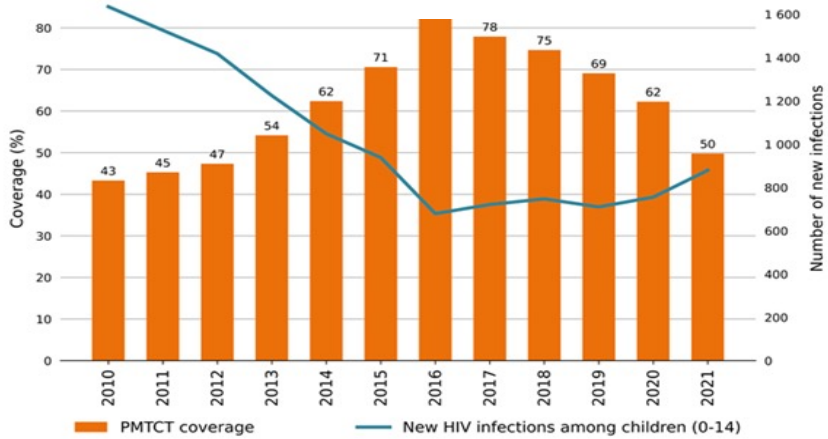
Source: Eaton 2022

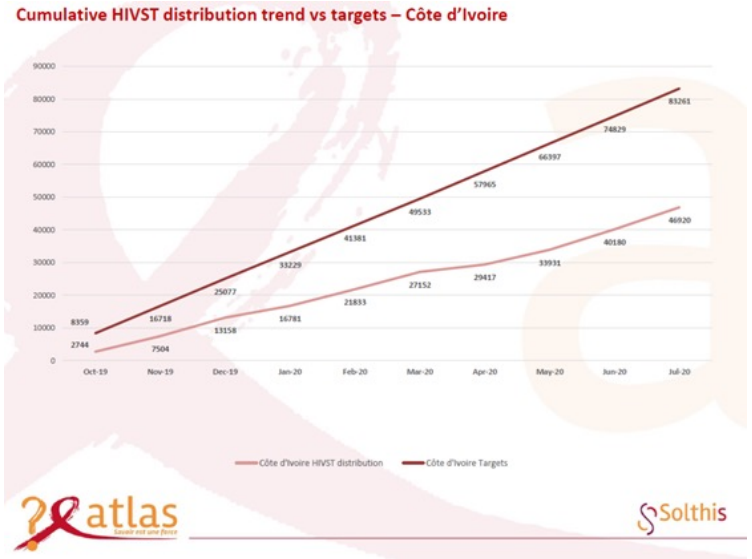
Review data routinely to optimize programming

Examples of country routine data analysis to monitor HTS:



PMTCT coverage and new infections in children, Burundi:





Source: Eaton 2022, HIVST ATLAS data CIV 2021, UNAIDS, special analysis 2022

Data triangulation to measure HIVST impact: Example from Cote d'Ivoire

- The estimated effect of HIVST kit distribution shows a nonsignificant negative signal on conventional testing
- Even if only 20% of distributed kits are used, HIVST **would increase access to testing**
- An increase by 1000 units of the number of HIVST **increases significantly positive diagnosis by 8**
- No association between HIVST kit distribution and ART initiations was observed
- Reference: https://doi.org/10.1097/QAD.0000000000003328

AIDS

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EPIDEMIOLOGY SCIENCE

Routine programmatic data show a positive population-level impact of HIV self-testing: the case of Côte d'Ivoire and implications for implementation

Simo Fotso, Arlette[a,b]; Johnson, Cheryl[c]; Vautier, Anthony[d]; Kouamé, Konan Blaise[e]; Diop, Papa Moussa[d]; Silhol, Romain[f]; Maheu-Giroux, Mathieu[g]; Boily, Marie-Claude[f]; Rouveau, Nicolas[a]; Doumenc-Aïdara, Clémence[d]; Baggaley, Rachel[c]; Ehui, Eboi[e]; Larmarange, Joseph[a]

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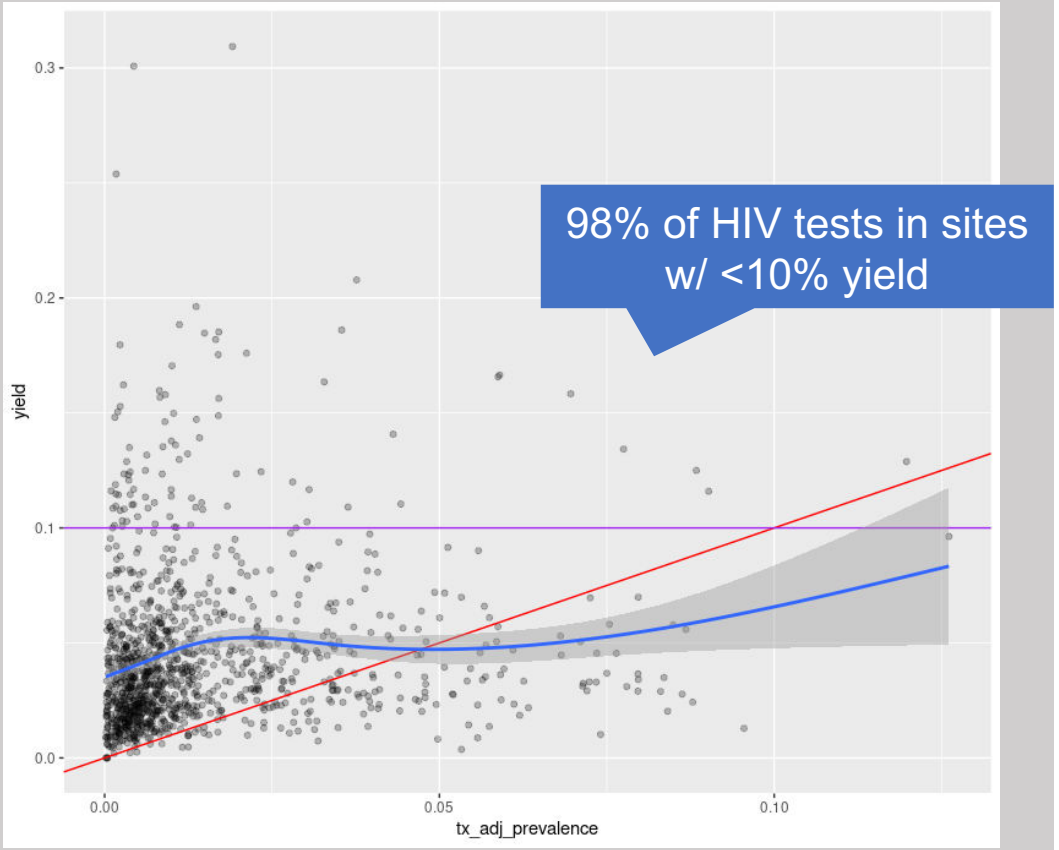
Abstract

Objectives:

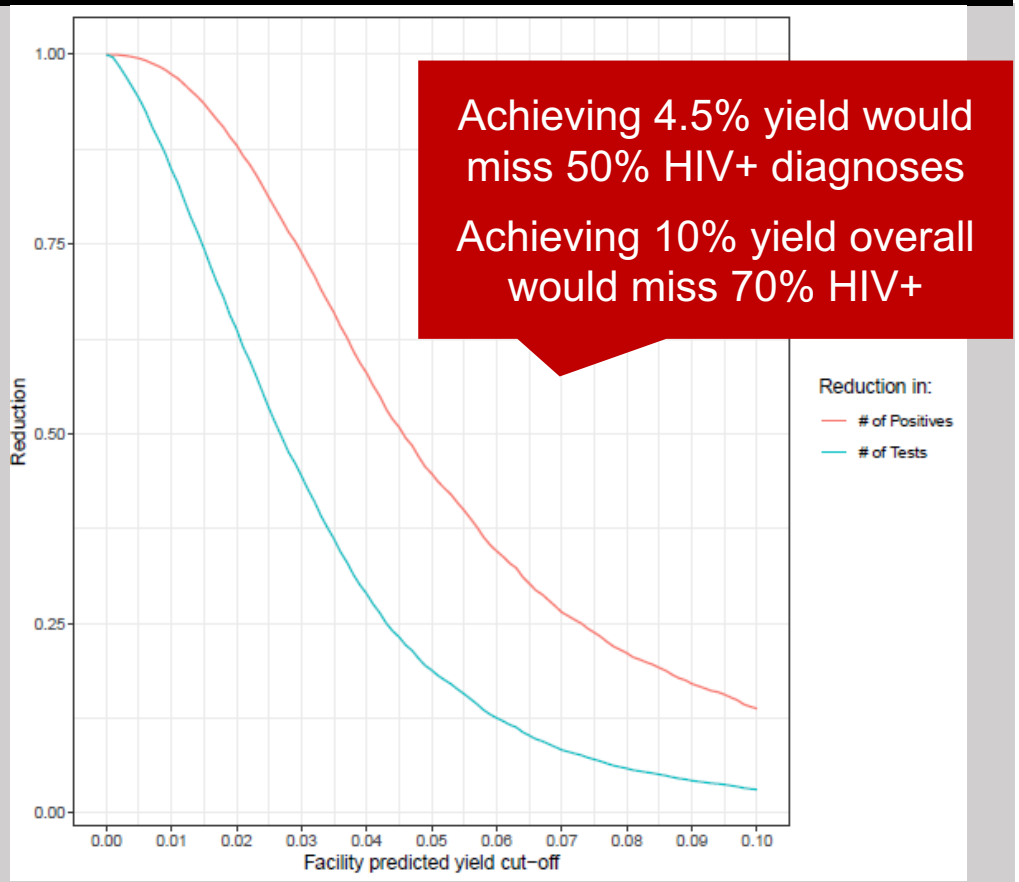
We estimate the effects of ATLAS's HIV self-testing (HIVST) kit distribution on conventional HIV testing, diagnoses, and antiretroviral treatment (ART) initiations in Côte d'Ivoire.

Finding the balance of targeted testing is challenging, and can have significant impact on achieving global goals

Other PITC compared to treatment-adjusted prevalence at sub-national level



Reductions in number of tests and positives based on Other PITC yield targets



Source: Special analysis sub-set of countries, Oct 2021, Other PITC by SNU2 yield and testing, correspondence Ian Fellow, Jeff Eaton, Ray Shirashi, Stephanie Behel, Rachel Golin, Jessica Rose, Mike Grillo, Mary Mahy, Rachel Baggaley, Cheryl Johnson, Vincent Wong

Conclusion

1. **Knowing your epidemic**

   Including variability by population, geography, etc

2. **Review HTS programme data**

   By approach, sex, age, geography

   1st-time testers and key populations

   Linkage (Prevention and ART)

3. **Define what's working and not working**

   By geography, entry point and population

   Define facilitators and barriers to access

4. **Adapt and build strategies that fill gaps**

   Cost-effective (#/% positive)

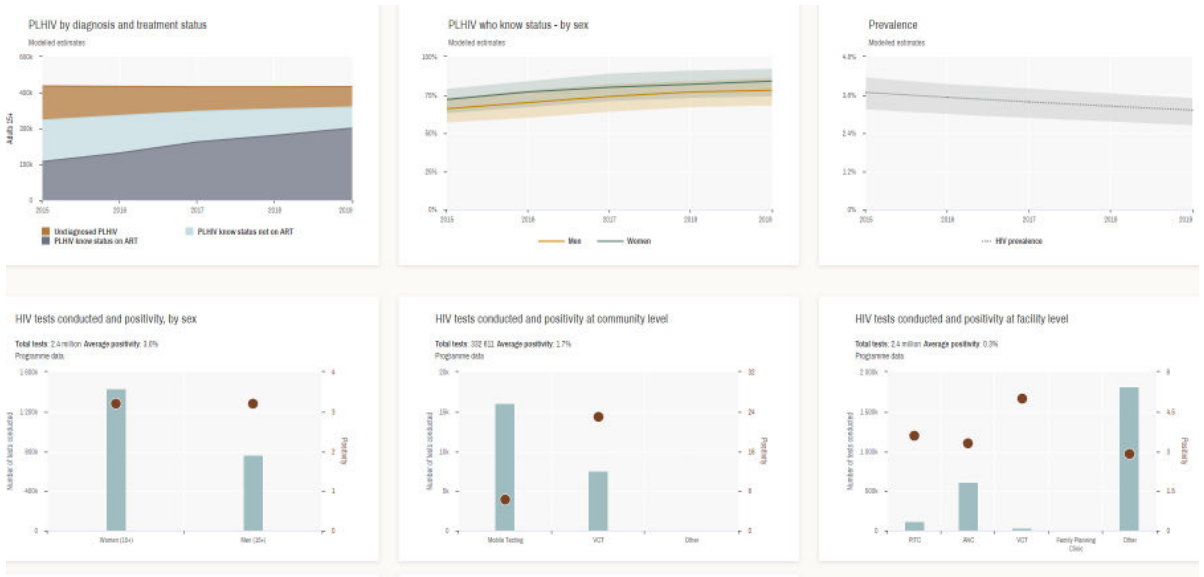
   Addresses barriers and increases reach among highest risk (e.g. key populations)

   Accelerates achieving 95-95-95 targets

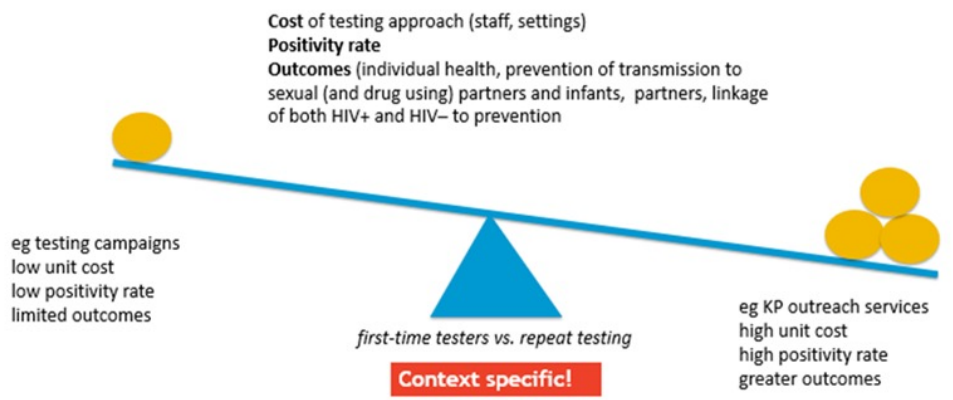
5. **Determine what to stop**

   Including what HTS to refocus and do less

   Update resource allocation and budgeting



Balancing efficiency and impact



Source: WHO, 2019: https://www.who.int/publications/i/item/WHO-CDS-HIV-19.31

WHO HTS Data Dashboards: https://whohts.web.app/

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All other partners for permission to use slides

For more information on HIV testing services

WHO HIV Testing Services Dashboard	WHO HIV Testing Services Info App	WHO HTS GL

Questions?

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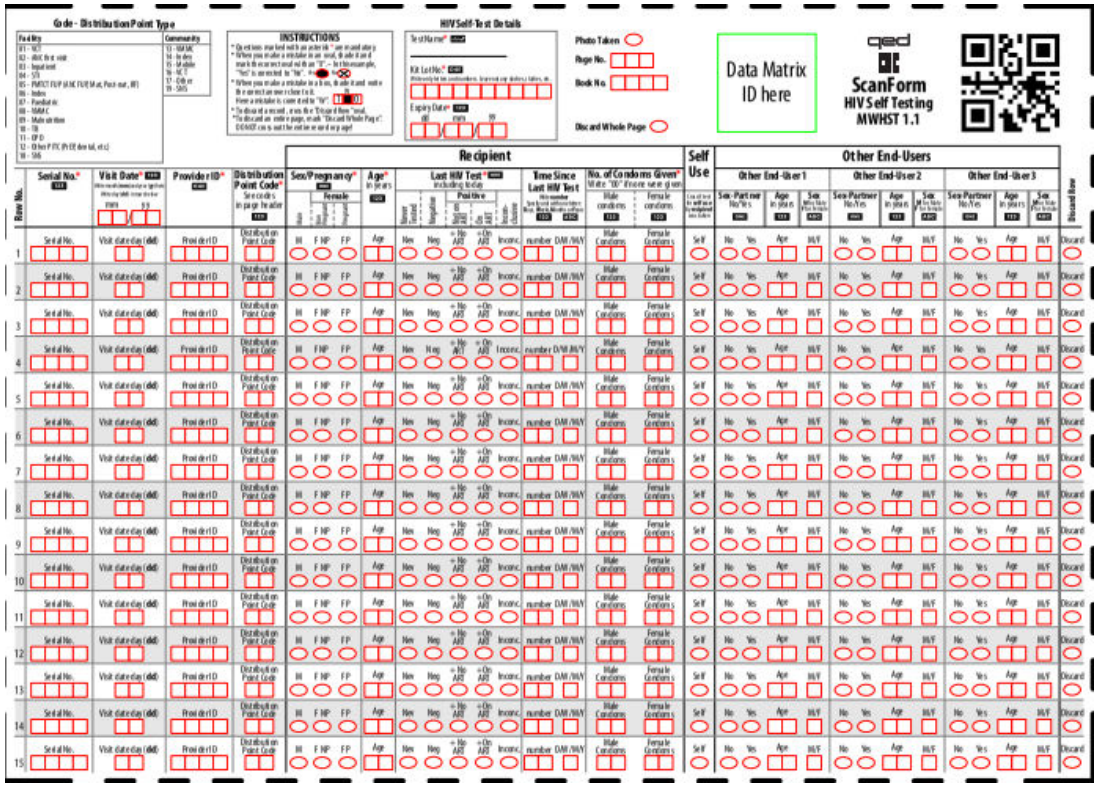
Consolidate guideline HIV Strategic Information

Table 3.1 Priority indictors for HIV testing

Ref. no.	Short name	Indicator definition	Numerator	Denominator
HTS.1 ●	People living with HIV who know their HIV status (first 95)	Number and % of people living with HIV who know their HIV status	Number of people living with HIV who have received their diagnosis and are still alive	Estimated number of people living with HIV
HTS.2	HTS test volume and positivity	Number of HIV tests performed (volume) and the % of HIV-positive results returned to people (positivity)	Number of tests conducted in which a new HIV-positive result or diagnosis was returned to a person during the reporting period (positivity)	Number of tests performed where results were returned to a person during the reporting period (testing volume)
HTS.3 (NEW) ●	People testing positive for HIV	% testing positive among people who received an HIV test in the reporting period[1]	Number of people who test HIV-positive in the reporting period and have results returned to them	Number of people receiving an HIV test in the reporting period
HTS.4 ●	Linkage to ART	% of people newly diagnosed with HIV initiated on ART	Number of people newly diagnosed with HIV and started on ART during the reporting period	Number of people newly diagnosed with HIV during the reporting period
HTS.5	HTS partner services	Number of people who were identified and tested using partner testing services and who received their results	For the general population: Number of elicited partners and other contacts[2] of people diagnosed with HIV who received HTS For key populations: Number of elicited contacts of members of key populations who received HTS	NA
HTS.6	HIVST distribution	Total number of HIV self-test (HIVST) kits distributed during the reporting period	Number of individual HIVST kits distributed	NA

Example of HIVST testing register:



Consolidated guidelines on person-centred HIV strategic information: strengthening routine data for impact (who.int)

Self-testing Framework

World Health Organization

PREPARATION

- Demand generation
- Support package
- Accessible & affordable

Uptake among at-risk groups

DIRECT ACTION

- Link to treatment
- Re-link to Tx
- Disclosure/Shared knowledge of status
- Link & engage with Prevention
- Triaged out of Health System

DIRECTIMPACT

- Health: Reduced Morbidity & Mortality
- Reduced Transmission & Infections Averted
- Cost and Time Savings (Health System & Users)

ADDITIONAL IMPACT

Social & Economic

- Population Productivity & Growth
- Social Benefit Social Harm

Health Systems

- Efficiency
- Expanded Coverage
- Equity of Health

**Adapted framework based on BMGF & UNITAID HIVST Meeting in January 2017*

DIFFERENT POPULATIONS **DIFFERENT CONTEXTS** **DIFFERENT GEOGRAPHIES**