

Prevention of vertical transmission and improving infant diagnosis – What do we need to do now?

Problem

Access to HIV testing for infants and young children has expanded considerably over the past decade with nearly 2 million tests performed per year across low- and middle-income countries (1). However, UNAIDS' 95-95-95 targets have stagnated for children.

In 2024, approximately 66% of the estimated 1.4 million children living with HIV know their status, 86% of those are on antiretroviral therapy (ART), and 84% of those are virally suppressed (2-4). These targets unfortunately have been consistently lower than those for all ages and adults (86-89-93) (Figure 1).

The consequences of missing children or delayed treatment can be devastating. HIV-related mortality of infants infected with HIV peaks at 2-3 months of age (5), highlighting the importance of identifying all women living with HIV and linking them to optimized ART. Without treatment, 50% of perinatally infected children living with HIV die by their second birthday (6,7).

The first 95 (children living with HIV knowing their status) and therefore access to infant diagnosis is a significant and persistent challenge preventing countries from achieving elimination of vertical transmission and ending AIDS in infants and children.

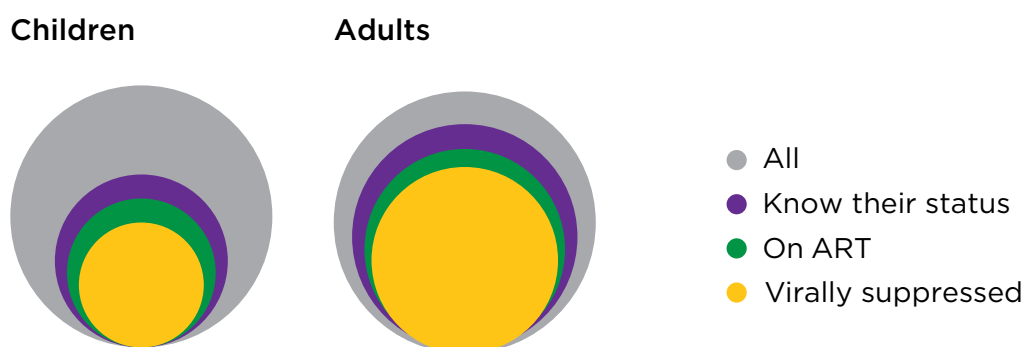


Figure 1

In 2024, UNAIDS reported that 120,000 children acquired HIV and 75,000 children died from HIV that year (2). Decisions in 2025 by several national governments to reduce international funding for low- and middle-income countries have significantly impacted people living with HIV and the health care systems supporting their care and treatment (8,9). Since January 2025, it was estimated that over 7,000 children will lose access to ART every day and nearly five times more infants will acquire HIV daily (10).

In 2023, ASLM conducted a policy review focused on vertical transmission across 24 countries in the region. All countries reviewed have vertical transmission policies that address testing of pregnant mothers as well as testing after delivery and during breastfeeding. However, implementation of these policies remains incomplete.

An assessment by WHO-AFRO found that infant testing coverage is <80% in over 70% of countries,

while turnaround times of tests within the laboratory are consistently longer than 15 days in nearly 80% of countries.

The turnaround time of test results from sample collection to the caregivers is critical to ensure rapid clinical decision-making; however, over 70% of countries report that less than 75% of results are received by the caregiver within 30 days. Unfortunately, stock outs of reagents and commodities over six-month time periods were consistent in nearly all countries.

Solutions

Elimination of vertical transmission and ending AIDS starts before a woman becomes pregnant. We now have a set of tools available that should be prioritized within national strategies and implemented to their fullest along the entire cascade (Figure 2).

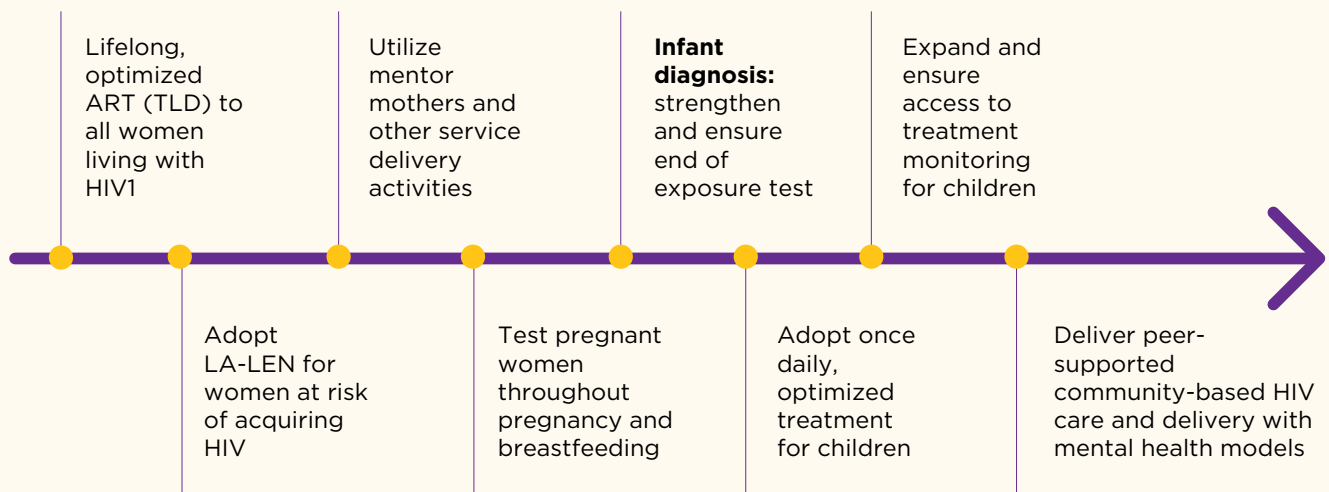


Figure 2

Implementing these tools will require strong political will, commitment, and resources, robust procurement practices, streamlined supply chains, trained, compassionate medical personnel free from stigma, and adaptable, person-centred delivery models.

Political will and policies

National and international efforts to eliminate vertical transmission exist. In 2022, the Global Alliance to End AIDS in Children was launched with ambitious commitments across countries to end AIDS in children by 2030 (11,12). According to UNAIDS' data, twelve countries account for about two-thirds of all new infections in children (12): Angola, Cameroon, Cote d'Ivoire, Democratic Republic of the Congo, Kenya, Mozambique, Nigeria, South Africa, Uganda, United Republic of Tanzania, Zambia, Zimbabwe – all of which are ASLM LabCoP countries.

WHO's Triple Elimination Initiative further reinforces political commitment by setting integrated targets for HIV, syphilis, and hepatitis B, including achieving 95–95–95, maintaining ANC

and HIV testing coverage $\geq 95\%$, and reducing pediatric infections to < 50 per 100,000 live births with $< 5\%$ transmission among breastfeeding populations (13,14).

To date, at least 12 countries in sub-Saharan Africa have reached the target of 95% ART coverage in pregnant women (15); however, few countries have reached infant testing coverage rates of 90% and 5% vertical transmission rates (15). No sub-Saharan African country, besides Eswatini, has yet achieved 90% of children living with HIV receiving ART (15).

Botswana has successfully eliminated the vertical transmission of HIV – the first high HIV burden country to do so by reaching WHO's Gold Tier (16,17).

Key milestones leading to country VTP successes: case study from Botswana



Political will, government support and international partners' support

- Strong political leadership, including support from presidential levels
- Sustained government and international funding ensured long-term sustainability



VTP focal persons, community health workers, and counsellors: resourced and supported

- Dedicated vertical transmission personnel ensured effective program oversight
- Strong engagement of focal persons across health facilities
- Follow-ups by counsellors



Capacity building and rapid adaptation to new protocols

- Continuous training of healthcare workers
- Quick adoption of new treatment protocols
- Free ARVs to all, non-citizens included

Viral load decentralized

- Sample collection done in every health care facility
- Transportation innovations for rapid sample transportation
- Outreach done monthly to mobile stops and communities



Engagement of district health management teams and CSO's

- Sensitization on new changes
- CSOs working with WLHIV were engaged as part of TWG
- Capacity building of HCV on human rights and gender equality

Recommendations

Infant and child case-finding and testing
A variety of evidence-based solutions have arisen that can support both improved infant and child case-finding and testing (18). However, these strategies require innovation and expansion to ensure comprehensive testing. As vertical

transmission rates decrease and programs strengthen, it will become more challenging to achieve national and global targets. As elimination targets are reached, it will be critical to add case-finding strategies outside traditional vertical transmission program settings (Figure 3).

It should be:

“”, with the # being superscript



Case-finding[#]

- Known HIV-exposed infants
- Healthy*: EPI, outreach
- Sick*: malnutrition, TB, inpatient wards
- Outreach*: community, family testing.



Timing

- At birth*
- 6-10 weeks after birth
- End of cessation of breastfeeding
- Consistent confirmatory testing



Technological innovations

- Same-day point-of care testing
- Diagnostic integration (ie. device and service sharing)
- Disposable molecular testing**

Routine maternal HIV testing and access to optimized ART

#Testing or determining exposure status

*Contextually-dependent: requires consideration of national prevalence rates and gaps

**Once developed and commercially available for LMICs

Recent innovations in technology have resulted in molecular testing being available outside of the laboratory. Several existing and upcoming “point-of-care” assays could be considered to provide same-day testing and result delivery, allowing for rapid clinical decision-making and treatment initiation. Same-day point-of-care infant testing has been shown to significantly decrease turnaround times and increase the proportion of infants and children living with HIV started on ART within 60 days of testing (19,20). Infants and children should receive the same timely diagnosis as adults.

End of exposure testing: implementing birth testing and a subsequent infant test within the first two months of life will not be enough to identify all new HIV acquisitions, particularly with ongoing breastfeeding practices. Breastfeeding, especially in low- and middle-income settings where food security can be limited, provides optimal nutrition and development as well as protection from other infections (21,22). However, vertical transmission is possible during the breastfeeding period, particularly if the mother has no or limited access to ART (23).

Therefore, it is critical for national programs to prioritize, implement, and regularly track HIV testing at the end of the exposure period (i.e. complete cessation of breastfeeding) for all infants at risk of vertical transmission. Infants should be tested three months after the complete cessation of breastfeeding: either using a nucleic acid-based testing if that timepoint occurs when the infant or child is less than 18 months of age or a traditional rapid diagnostic antibody test if that timepoint occurs when the infant or child is more than 18 months of age (18).

Important note: all infants and children who test positive for HIV should receive confirmatory

testing as ART is initiated (18). ART should not be delayed. As vertical transmission and positivity rates decrease, positive predictive values of one-test algorithms decrease considerably, even for tests with very high specificity rates. Therefore, it is critical to confirm all HIV diagnoses, ideally with a separate, new sample.

Service delivery considerations

In recent years, several additional ideas and considerations have been tested and implemented based on country experiences to ensure case-finding, identification, and retention of children living with HIV. A variety of those are highlighted below:



“One-stop shop” model of services for pediatric clients by integrating infant diagnosis into maternal-child health, child welfare clinics, and other testing points.



Scale-up electronic medical records in vertical transmission service delivery points (e.g. sexual and reproductive health, maternity, child welfare clinics) to track women and infants from pregnancy to postpartum and cessation of breastfeeding.



Strengthen facility-community interface to support strengthened vertical transmission programs, case-finding, and retention in treatment and care.



Peer-supported community-based HIV care delivery can support the child and/or caregiver as they navigate the health care system and provide helpful community resources and psychosocial support.



HIV-exposed infant birth cohort monitoring registers at child welfare clinics to track and test children less than two years of age.



Capacity building for health care workers to create efficient yet comprehensive care services and understand optimal case-finding and screening services.



Regular mentorship and support visits to improve case-finding, implementation of best practices, and strong service delivery activities (e.g. stigma-free counseling, retention outreach, etc.).



Use of infant diagnosis champions and mentor mothers to support improved entry and retention in vertical transmission programs and related service.

Call to Action

Countries are facing the need to re-prioritize or re-structure their national health priorities and plans, ensuring key interventions are funded and can be seamlessly maintained. Additional investments through domestic funding will be required to fill some of the gaps remaining following international funding cuts.

Infants and children affected by and living with HIV must remain a top priority by national governments and programs. They are at risk of rapid and devastating mortality, without the proper care and treatment.

Over the years, several best practices and next steps have emerged from successful country vertical transmission programs. These include:

- **Engage the community** in addressing existing gaps, executing awareness campaigns, providing home-based ART and related care, supporting improved retention of families and their children in care and treatment programs, and educating the general population and those affected of the risks of HIV for infants and children and benefits of rapid and continued treatment and care.
 - Improve evidence-based follow-up and **retention mechanisms**, including mHealth solutions like SMS and phone calls.
 - Persistent **equipment maintenance**, procurement, supply chain challenges must be addressed.
 - Execute **diagnostic integration systems** and diagnostic network optimization activities to create efficiencies, especially for HIV infant testing and monitoring and tuberculosis diagnosis.
 - Implement key innovations to improve case-finding, such as **family engagement and testing**, integration of vertical transmission services with maternal and child health programs (e.g. EPI, child welfare clinics, etc.), and routine testing of children presenting to sick wards (e.g. malnutrition, tuberculosis clinics, and inpatient wards).
 - Consider **task-sharing models** to decentralize and ensure the presence of testing, treatment, and care activities and programs for vulnerable and at-risk infants and children and their families.
 - **Utilize same-day point-of-care testing** to reduce morbidity and mortality through rapid result provision and linkage to treatment.
 - Ensure HIV-exposed infants and children are **tested multiple times throughout the period of exposure and especially after cessation of breastfeeding**.
 - Implement **data-driven systems** using routine laboratory data, such as including consolidated patient-level line lists for tracking/tracing, de-identified data with ready disaggregation for monitoring and surveillance, and unique identifiers to improve health monitoring and retention in care.
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