

Charting the Path to Sustainable HIV Epidemic Control and Ending the HIV Epidemic as a Public Health Problem in Uganda by 2030: Innovations and Advances

Wilford Kalungi and Joshua Musinguzi describe the results of an analytical method that involved triangulation and synthesis of HIV surveillance and epidemiological and routine HIV services data reported by health facilities in Uganda.

Introduction

Achieving sustainable HIV epidemic control in the short-term, and ending the HIV epidemic as a public health problem by 2030 is a strategic objective of Uganda's current epidemic response in line with the targets under Sustainable Development Goal (SDG) 3.3.¹ So far, Uganda has made considerable progress towards the national and global targets of reducing new HIV infections and AIDS-related deaths. This in turn has led to hundreds of thousands of HIV infections averted and hundreds of thousands of people with HIV infection (PLHIV) living healthy and productive lives. However, by 2023, new HIV infections in Uganda still exceeded AIDS-related and all cause mortality among people living with HIV, and as such, HIV epidemic control has not yet been attained.

It is imperative for Uganda to continue to reduce new infections at an ambitious but attainable pace in order to attain and sustain HIV epidemic control and eventually low HIV incidence as envisaged in the UNAIDS Lancet Commission report for high HIV incidence countries.² Sustaining epidemic control requires active programmes to maintain low infections and AIDS-related morbidity. In the context of HIV, this means sustaining extremely high treatment coverage and viral suppression among PLHIV, monitoring timely HIV diagnosis, providing HIV prevention services adapted to changing individual risk and preferences, and comprehensive HIV services for key populations, including men who have sex with men, people who inject drugs, and sex workers.

Now with six years left to 2030, it is necessary to take stock of progress in containing the evolving HIV epidemic, the coverage of measures to control it, and what it will take to attain epidemic control in the short term and eventually end the epidemic as a public health problem. This analysis aimed to document the advances made to date, and define the innovations and optimised package of HIV services required to attain HIV epidemic control during the remaining period.

Analytic Methods:

The analysis involved triangulation and synthesis of HIV surveillance and epidemiological and routine HIV services data reported by health facilities in Uganda. We also conducted mathematical modelling to project the future course of the epidemic taking into account services and targets for ending the HIV epidemic by 2030. Simulations on the future course of the epidemic considered optimised targets for various services to be scaled up during the remaining period to 2030. We defined a priority package of services for optimisation, and estimated its resource requirements based on the published unit costs for delivery of the services in the country. A 3% annual discount rate on future costs was applied. The cost effectiveness of the package and the estimated return on investment were also assessed.

For this analysis, surveillance and programme data from the national programme and the official Spectrum files for Uganda were used. We explored various scenarios in line with current national strategic plans for the periods up to 2025, and ambitious but attainable targets for critical services for the period 2025 - 30.

Advances Towards HIV Epidemic Control and Ending the Epidemic as a Public Health Problem:

Uganda has made considerable progress towards the national and global targets of reducing new HIV infections and AIDS-related deaths. The targets comprise of a 75% drop in AIDS-related mortality and new infections during 2010 - 20, and a 90% drop during 2010 - 30. Although HIV incidence, new HIV infections and estimated AIDS-related mortality consistently dropped in Uganda during 2010-2022, Figure 1, the drop fell short of the SDG 3.3 target of 75% by 2020. Uganda achieved 52% and 60% drop in new infections and AIDS-related mortality respectively during this first decade.

Wilford L Kirungi is a clinical research who has expertise in the area of HIV. Joshua Musinguzi is the Assistant Commissioner -AIDS Control Division, Ministry of Health, Uganda.

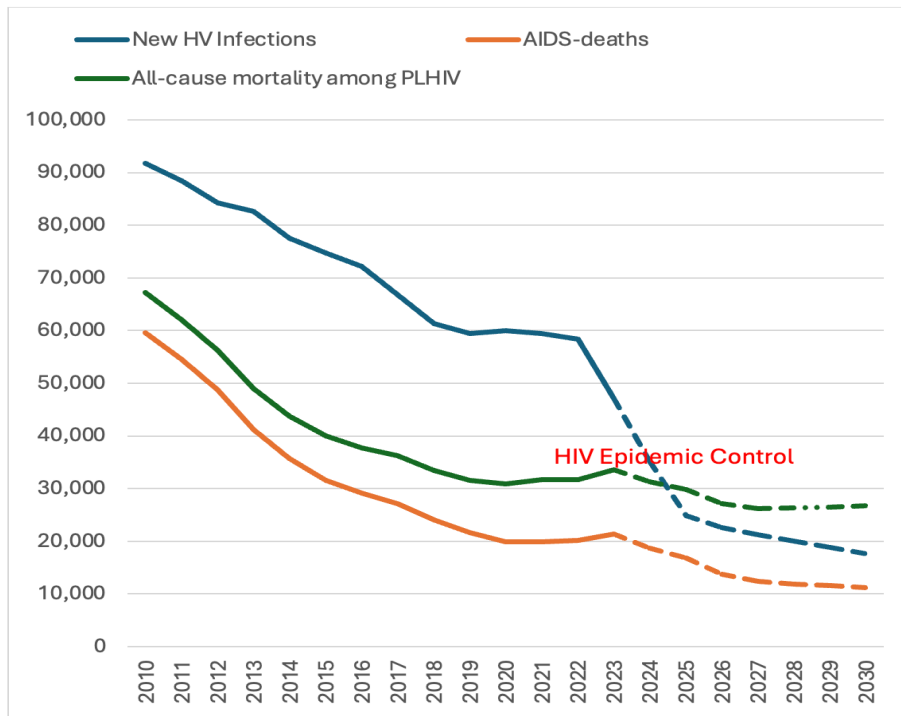


Figure 1: Trends in Estimated New HIV Infections, AIDS-Related and All-Cause Mortality 2010 – 22 in Uganda, with Projections 2023 - 30 under the priority package of Services scale up Scenario

The HIV epidemic remains severe, generalised and heterogeneous across geographical, socio-demographic and economic subgroups in the country. Young women and adolescent girls, along with key and priority populations (KPs/PPs) still bear disproportionately high HIV incidence, which in the case of key and priority population groups, is of the order of 10 – 15 fold that of the general population. The estimated vertical infections also dropped during this period, but remain high, at 5,930 in 20223, and virtual elimination is yet to be attained. About 1.45 million adults are living with HIV in the country, with approximately 81% diagnosed, 78% enrolled on HIV treatment, and 75% achieved viral load suppression (VLS) by 2020.⁴ However, adult men and children, adolescents and key and priority populations were still lagging behind in the HIV testing and treatment cascade. These figures have since improved over the past 2 – 3 years although the disruption of HIV services by the COVID-19 pandemic and its mitigation measures might have affected the rate of progress. Nonetheless, achievement of the triple 95-95-95 targets by 2025 appears to be within reach.

In addition to the above, Uganda has also registered advances in recent years with coverage of HIV testing, treatment, and PMTCT services. The coverage of safe male circumcision (SMC), condom use, behavioural interventions, interventions for adolescent girls and young women (AGYW), pre-exposure prophylaxis (PrEP), and services for KP/PPs remain sub-optimal⁵, yet these services were found in this analysis as the interventions for impact, necessary for sustainable HIV epidemic control and ending the HIV epidemic as a public health problem by 2030. In addition, modest gains have also been made with services for the “critical enablers” comprised of Social Behaviour Change Communications, stigma and discrimination,

and sexual and gender-based violence (SGBV). Scaling up these services and sustaining the gains made in the others will be critical to attainment of HIV epidemic control, and ultimately meeting national and international impact targets for ending the HIV epidemic as a public health problem as was envisaged in the UNAIDS-Lancet Commission report.²

The Optimised Package of Services for Achieving HIV Epidemic Control Targets:

Based on this epidemic and programme context, various scenarios (comprised of a mix of various services) were considered for scale up during the remaining six years and their potential impact estimated through mathematical modelling projections using Spectrum Goals model.⁶ An optimised cost-effective priority package of services that has the potential to significantly “bend” the curves of new HIV infections and AIDS-related mortality, and lead to attainment of national and international targets by 2030 was derived (Figure 1).

This optimised scenario envisages that by 2025 scale up of: HIV testing and treatment to ensure over 95% of PLHIV are diagnosed; 95% of PLHIV are enrolled on efficacious antiretroviral therapy; consistent condoms use increased to at least 90% among high risk groups; male circumcision coverage of adult males increased to over 80%; PMTCT services provided to over 95% of HIV-infected pregnant and breast-feeding women; PrEP services offered to at least 80% of high-risk population groups; at least 20% of AGYW in high HIV incidence districts provided comprehensive services; and reaching at least 90% of KP/PP with effective interventions, (Table 1). These high coverage levels attained by 2025, should be sustained or gradually increased during 2025 – 2030 in order to sustain HIV incidence and AIDS-related mortality

Table 1: Priority Package of Services and Targets For Impact Necessary to Meet the 2030 HIV Epidemic Reduction Targets

Service	Baseline 2022 Coverage	2025 target	2030 Target
<i>HIV Testing: Percent of PLHIV aware of their HIV serostatus</i>	92	>95	>95
<i>Antiretroviral Therapy: Percent of PLHIV enrolled on ART</i>	84	95	95
<i>Viral Suppression: Percent on ART that are virally suppressed</i>	92	95	> 95
<i>PMTCT: Percent of HIV-infected Pregnant and Breast Feeding Women enrolled on ART</i>	92	>95	>95
<i>SMC: Percent of adult males 15 – 49 yrs circumcised</i>	60	80	80
<i>Condoms: Percent of males using condoms with casual partners</i>	35	50	80
<i>AGYW: Percent of AGYWs provided a comprehensive package of services in all high HIV incidence districts</i>	3	10	20
<i>PrEP: Percent of high risk groups taking PrEP</i>	20	95	95
<i>KP: Percent of KPs offered HIV prevention services</i>	40	95	95

declines. Closing viral suppression disparities, especially among sexually active populations has the potential to further drive down infections also constitutes a priority.

Sustainably implementing these priorities must recognize that success combating HIV will involve more than health system interventions. Effective management systems, addressing societal enablers such as a supportive legal environments, gender equality, ending stigma and discrimination, and coordinated multisectoral response to promote HIV awareness and deliver services, and community leadership, will be key to the success of the HIV response. As with every stage of the HIV response thus far, empowered communities will ensure success through increasingly delivering HIV services, guiding needs and quality improvement, and monitoring and holding governments accountable for delivery of the services.

The analysis found little scope for geographical targeting of HIV services to achieve national targets. HIV treatment services are required wherever there are PLHIV. For HIV prevention, if resources are constrained, there might be limited scope of targeting some HIV prevention services to geographical areas with high HIV incidence.

This package and targets therein are projected to avert approximately 190,000 new HIV infections and 20,000 AIDS related deaths compared to a scenario where the coverage of services is kept constant at 2022 coverage-levels (Figure 2).

Cost Estimates:

Scaling up the optimised priority package of services to achieve the targets was estimated to cost US\$ 8.2 billion during 2021 - 30, of which US\$ 1.7 million is incremental funding (approximately 20% increase in annual spending). The incremental funding will largely finance interventions for AGYW, condoms, and social enablers especially violence prevention and stigma and discrimination.

The optimised priority scale up package of services and targets in this analysis makes a compelling case for investment. The cost per infection averted was estimated at \$15,000, with favourable return on investments of approximately 5.6 taking into account the discounted costs of treatment averted, and increased productivity

arising from morbidity and mortality averted, and a more healthy and productive population of PLHIV. We anticipate progressively reduced spending on HIV treatment in the future since the numbers in need of treatment will begin to fall mid-way and will be 6% less by end of the decade than if coverage of the services is kept constant. In other words, this prioritised package will result in significant savings for the future. However, in order to harness the savings, there is need to front load the investment now.

Innovative Financing of the Expanded HIV Response:

Meeting the targets in this priority package will require substantial funding. Although Uganda's HIV response attracted substantial resources from domestic and external partners, the total resource envelope fell short, and funding gaps remained. The funding landscape for the national response has remained level over recent years, and there are no realistic prospects of increased external financing overall. Domestic funding for HIV treatment in the government budget has had annual increment of approximately US dollars 10 – 15 million during recent years.

It is envisaged that it will be possible to scale up HIV treatment and testing services within the current resource envelope in view of the cost saving measures and innovations such as targeted HIV testing and differentiated HIV services delivery models (DSDM). Cost savings could also arise when HIV testing and treatment, and male circumcision attain the saturation targets after 2025, and spending thereafter will be on maintenance of coverage levels. Such cost savings should be used to fund other under-resourced services.

This analysis has highlighted the advances in the national HIV response towards HIV epidemic control, the gaps that remain, and what it will take to achieve the national strategic objective in the short-term, and end the HIV epidemic as a public health problem by 2030. This makes it imperative for Government of Uganda and its partners to consider innovative strategies for implementing and funding the HIV response to meet these national and global targets. The first strategy is to maintain current funding from domestic and external sources - now is not yet the time for any of the current

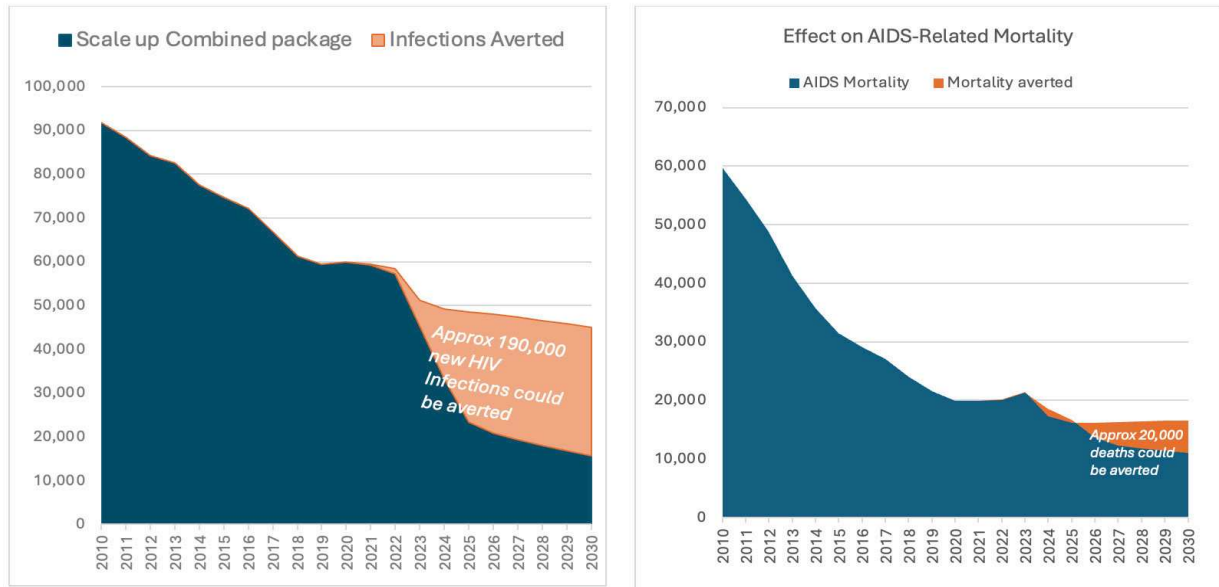


Figure 2: Trends in New HIV Infections (Left) and AIDS Related Mortality (Right) 2010 – 2022; with Projections 2023 - 30 under the Priority package scale up (dark blue) and Infections and Mortality that would be averted during 2023 – 24 (Maroon Colour)

funding streams to contemplate reduction in funding. Secondly, additional resources should be mobilised from domestic and external sources. As part of this, it is imperative for the Government to consider significant increases in its own budget allocation to health and HIV services in real terms, to at least meet the targets in the Abuja Declaration.⁷ This realisation is more compelling now as Uganda approaches attainment of lower middle-income status that comes with limited external donor financing. For this reason, it is worthwhile for Uganda to actualise innovative domestic funding avenues, such as operationalisation of the National Health Insurance Scheme (NHIS), the National AIDS Trust Fund (NATF), the one-Dollar Initiative, and other innovative domestic financing schemes. Although the Government has prioritised the revenues expected from the recently discovered petroleum resources to infrastructure development, funding of HIV services also makes a compelling case.

The national response should also continue to mobilise additional resources from its bilateral and multilateral external partners especially the US Government, the Global Fund, and others. This could be reinforced with soliciting funds from other partners including the World Bank, African Development Bank, and other lending institutions. This analysis should support such initiatives by highlighting the case that spending now represents a saving for the future.

Given that most of the incremental funding is required to support programmes for AGYW, and social enablers that are critical for increased uptake of other HIV prevention and treatment services, financing such interventions need not entirely come from the HIV budget. Such services could in part be financed by leveraging resources for social development initiatives in the country, but this requires high level coordination.

Lastly, unabated innovation underscores reasons for optimism to sustain long-term epidemic control. The HIV

response has been at the forefront of ensuring access to affordable medicines and commodities for those who need them. Savings will continue to be found in the response from data-driven and timely adoption of emergent technologies that are community and client centred for optimal prevention of new infections and viral suppression.

The findings of this analysis should support HIV programme managers and decision makers to prioritise HIV interventions and investment decisions during the remaining period of this decade and beyond. Policy makers in government, national treasury, national planning and health services, and bilateral and multilateral funding partners, local governments authorities, and civil society advocates should make use of these findings in their planning, development assistance, resource mobilisation and allocation decisions.

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