



The Republic Of Uganda

THE HIV INVESTMENT CASE FRAMEWORK FOR UGANDA 2021-30

INVESTING NOW TO SAVE FOR THE FUTURE



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KAMPALA

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Acronyms

ACP	AIDS Control Programme
ADPs	AIDS Development Partners
AGYW	Adolescent Girls and Young Women
ANC	Antenatal Care
AOR	Adjusted Odds ratio
APN	Assisted Partner Notification
APN	Assisted Partner Notification
ART	Antiretroviral Treatment
ARVs	Antiretroviral Drugs
AZT	Zidovudine (Azidothymidine)
BSS	Behavioural Surveillance Surveys
CE	Cost-effectiveness
CER	Cost-effectiveness Ratio
CI	Confidence Interval
CITC	Client-initiated Testing and Counseling
CLHIV	Children Living with HIV
CPHL	Central Public Health Laboratories
CQI	Continuous Quality improvement
CSOs	Civil Society Organizations
DAI	Drug Access Initiative
DALYs	Disability Adjusted Live Years
DHIS-2	District health Information System 2
DHS	Demographic and Health Survey
DNA	Deo-oxyribonucleic Acid
DREAMS	Determined, Resilient, Empowered, AIDS Free, Mentored Safe
DSDM	Differentiated Service Delivery Model
DTG	Dolutegravir
EID	Early Infant Diagnosis of HIV
eMTCT	Elimination of Mother to Child HIV Transmission
ETPR	Epidemiological Tipping Point Ratio
EWI	Early Warning Indicators
FSW	Female Sex Workers
GHWP	Good Health for Women Project
HAART	Highly Active Antiretroviral Treatment
HBV	Hepatitis B Virus
HC	Health Centre
HEI	HIV Exposed Infant
HIA	HIV Infections Averted
HICA	HIV Investment Case Analysis
HIV	Human Immunodeficiency Virus
HIVDR	HIV Drug Resistance
HMIS	Health Management Information System
HRL	HIV Reference Laboratories
HSDP	Health Sector Development Plan
HSHASP	Health Sector HIV/AIDS Strategic Plan
HST	HIV Self Testing
HTC	HIV Testing and Counselling
HTS	HIV Testing Services
IAC	Intensive Adherence Counselling
ICWEA	International Community of Women Living with HIV East Africa
IE	Impact Evaluation
IP	Implementing partner

IPT	Isoniazid Preventive Therapy
JAR	Joint AIDS Review
JARS	Joint AIDS Reviews
JCRC	Joint Clinical Research Centre
JUPSA	Joint UN Programme of Support on HIV/AIDS
KIIs	Key informant interviews
KP	Key Populations
Lag	Limiting Antigen
M&E	Monitoring and Evaluation
MC	Male circumcision
MDAs	Ministries, Departments and Agencies
MDR-TB	Multi Drug Resistant Tuberculosis
MIP	Mother Infant Pairs
MOAAIF	Ministry of Agriculture Animal Industries and Fisheries
MOES	Ministry of Education and Sports
MOFED	Ministry of Finance, Planning and Economic Development
MoH	Ministry of Health
MRC	Medical Research Council
MSM	Men who have sex with men
MSM	Men Who Have Sex With Men
MTCT	Mother-to-Child Transmission of HIV
MTR	Mid Term Review
MUSPH	Makerere University School of Public Health
NCDs	Non Communicable Diseases
NDP	National Development Plan
NNRTI	Non-nucleoside reverse transcriptase inhibitors
NRTI	Nucleoside reverse transcriptase inhibitors
NSP	National HIV/AIDS Strategic Plan
NTLP	National TB and Leprosy Programme
OPD	Outpatient Department
PCR	Polymerase Chain Reaction
PEP	Post Exposure Prophylaxis
PEPFAR	President's Emergency Plan for AIDS Relief
PITC	Provider Initiated Testing and Counselling
PLHIV	People Living with HIV
PMTCT	Prevention of Mother to Child Transmission
POC	Pont of care
PP	Priority Populations
PPE	Personal Protective Equipment
PrEP	Pre-Exposure Prophylaxis
PWID	People who inject Drugs
PWID	People Who Inject Drugs
PYs	Person Years
QALYs	Quality-adjusted Life Years
RHSP	Rakai Health Sciences Programme
RMNCAH	Reproductive, Maternal, Child and Adolescent Health
SARCoV2	Severe acute respiratory infection Coronavirus type 2
SBCC	Social Behavioral Change Communication
SDG	Sustainable Development Goals
SDGs	Sustainable Development Goals
SI	Strategic Information
SMC	Safe Male Circumcision
SOPs	Standard Operating Procedures
STDs	Sexually Transmitted Diseases
STIs	Sexually Transmitted Infections

TB	Tuberculosis
TDF	Tenofovir
TMA	Total Market Approach
TPT	Tuberculosis Preventive Treatment
TWG	Technical Working Group
UAC	Uganda AIDS Commission
UBOS	Uganda Bureau of Statistics
UDHS	Uganda Demographic and Health Survey
UHC	Universal Health Coverage
UNAIDS	Joint United Nations Programme on HIV
UNCST	Uganda National Council for Science & Technology
UNFPA	United Nations Population Fund
UPHIA	Uganda Population-based HIV Impact Assessment
UPS	Uganda Prisons Service
UVRI	Uganda Virus Research Institute
VCT	Voluntary Counselling and Testing
VL	Viral Load
VLS	Viral Load Suppression
VMMC	Voluntary Medical Male Circumcision

Foreword

The nearly thirty five year old HIV epidemic in Uganda is currently at the cross roads. The past decade has seen significant drop in new HIV infections as well as AIDS-related deaths in the country, partly due to the extensive roll out of HIV treatment services. At the same time, HIV epidemic control has not yet been attained, with new HIV infections and AIDS burden still very high. Uganda missed narrowly the HIV-related Sustainable Development Goals targets for 2020. Similarly, some groups like AGYW, key and priority populations, continue to have high HIV incidence, and sub optimal uptake of HIV treatment and prevention services especially among men, children, and adolescents.

During the same period, the uptake of many HIV prevention services such as safe male circumcision, safer sexual behaviour, post-exposure prophylaxis, and targeted programmes for key and priority populations remains sub-optimal and with significant gaps. We have concerns that the funding for HIV services from domestic and external sources appears to have levelled off in recent years and prospects for the future are uncertain, yet HIV epidemic control is not yet attained. This war is yet to be won. We are also concerned at the extent to which the global and national COVID-19 pandemic, and its mitigation measures have affected HIV epidemic control efforts.

This HIV investment case framework has come in timely. It has clarified three key priorities to inform the way forward in these circumstances: it has;

- Identified an optimal package of services to be scaled up, with ambitious targets to enable us not only end AIDS as a Public Health Threat in Uganda, but also to attain epidemic control, and other important national and global targets for the next decade
- Clarified on the estimated costs, including the incremental costs for implementing the optimal package and attaining the national targets
- Clarified the favourable returns on investments on this package that include potentially averting up to 130,000 new HIV infections, and 51,000 AIDS-related deaths, with favourable returns on investment of approximately 5.6

As the analysis has clearly shown, to attain these targets will not come cheap, but plausible, and the returns on investments are high. Uganda has previously shown the world what can be achieved in fighting HIV/AIDS with high-level political commitment and leadership right from the highest level. The projections made under the HIV investment case analysis point towards the way we should take.

Therefore, to implement the HIV Investment Case Framework, I appeal to all stakeholders in the country, right from the Cabinet, Parliament, local governments, civil society, our development partners, the private sector, communities and all stakeholders to play your viorus role based on our multi-sectoral landscape. That way, we will all work to end this horrible epidemic and hand over *an AIDS-free generation to posterity*.

I'm grateful to the stakeholders who under Uganda AIDS Commission's coordination developed this HIV investment Case Framework. I the development partners especially UNAIDS that provided technical support, and all the stakeholders that contributed ideas in the various fora.

I'm delighted to commend the HIV investment Case Framework to all stakeholders in the country.



Hon. Esther Mbayo, MP
Minister for the Presidency, Office of the President

Preface:

The Uganda HIV Investment Case Framework aims to guide strategic investments to meet national and global targets for the next decade. It has been developed through stakeholder consultation and extensive analysis of the epidemiology of HIV in the country; HIV prevention, care and treatment services and their service delivery models; modelling and projections of the future course of the epidemic that considered various scenarios; and the associated costs and financing of the national HIV response.

The investment case framework demonstrates what we need to do in the country in order to end AIDS as Public Health threat by 2030. It does not recommend new things or dramatic ways of doing them but emphasises the need to do more of what we know works well in order to make our previous investments to bear fruit. Doing so presents us a unique opportunity of ending this HIV epidemic during our lifetime.

First, we need to focus on a set of critical priority proven interventions that create maximum impact. This includes programmatic interventions as well as Social and Behavioural Change Communication, focus on Adolescent Girls and Young Women (AGYW), stigma, violence prevention, which are critical enablers that influence uptake of key services but may also have non-HIV programme benefits.

Secondly, we must scale up and sustain high levels of coverage of these critical services. Knowledge of HIV status among PLHIV must increase and be maintained to 95%, achieve and sustain the triple 95% by 2025, male circumcision should reach at least 80% of our young adult males by 2025. Others include scaling up condom use in risky sex to at least 80%, and PMTCT and EID services should be scaled up and maintained at over 95%.

Thirdly, services should be scaled up for the general population since Uganda's HIV epidemic remains severe and generalised. This should be augmented with services for population groups with high HIV incidence and disease burden such as AGYW, key and priority populations. Care and treatment services should address diagnosis, linkage, adherence and retention gaps among men, children and adolescents.

Fourth, if these services are scaled up, targets achieved and sustained, new HIV infections will drop substantially, and fall below all-cause mortality among PLHIV, hence achieving HIV epidemic control within 3 – 4 years. After that time, the number of PLHIV will begin to fall, and along with it, the number of individuals in need of ART, and expenditure on HIV will begin to fall as well. But we need this high initial investment to harness this *“saving for the future”*.

The analysis leading up to the investment case framework has also shown that we have achieved a lot during the past decade. We *“turned the curve”* of new HIV infections, vertical infections, and AIDS-related deaths. However, we need to do even more in the next decade to reach the global and national goals. Since Uganda narrowly missed the targets for 2020, we have some catch up to do. I therefore urge all stakeholders to work to ensure investment and implementation of the recommendations of this HIV Investment Case Framework.



Dr Eddy Mukooyo Sefuliya,
Chairman, Uganda AIDS Commission

Acknowledgements:

This HIV Investment Case Framework was developed through a participatory process involving a wide range of stakeholders in Uganda's multisectoral HIV/AIDS response. The process was led by four UNAIDS supported consultants who worked with the national steering committee and thematic working groups. The national steering committee provided oversight of the activity and cleared the final report. Technical consultations were conducted through the various thematic working groups that included the National HIV Prevention Committee, the National Care and Treatment Committee, the National HIV Estimates and Modelling team, the National M&E Committee, the Key Population Technical working groups, and Health Systems / Financing Technical Working Group. All consultative meetings during the latter part of the activity were conducted virtually in conformity with the mitigation measures for the prevailing COVID-19 pandemic.

Uganda AIDS Commission is grateful to all stakeholders for their input, especially those who participated in consultations through the national steering committee and the various standing thematic technical working groups. We are also grateful to individuals and institutions that provided useful data to support the analysis of the various components of the HIV investment case. Special thanks go out to development partners and implementing partners, Ministry of Health Planning Department, the Ministry of Finance, Planning, and Economic Development and other entities that provided data on financing of the national response.

We are grateful to the team that led the analysis and development of the HIV Investment Case Framework. The consultants' team comprised of four seasoned consultants; John Stover from Avenir Health, who led the modelling analysis in January – February 2020; Dr Wilford Kirungi was the lead consultant and also led the HIV epidemic analysis; Dr Alex Opio conducted the HIV programmes and implementation analysis; and Mr Julius Mukobe conducted the costing and implementation analysis.

In the same vein, I would like to thank Dr Vincent Bagambe, Director Planning and Strategic Information at Uganda AIDS Commission, who together with Tseday Alemsegad, UNAIDS Country Advisor on Global Fund / PEPFAR, coordinated the activity at country level and were on the core advisory team for the task. The Acting UNAIDS Country Director, Jotham Mubangizi, and the previous UNAIDS Country Director Karusa Kiragu, provided quality assurance and support for the drafts during the various phases. We are also grateful to the technical staff of Uganda AIDS Commission including Dr Peter Wakoba, Ms Sarah Kanakwa, and Mr Eugene Oola and Ms Christine Karugonjo, who ably coordinated the various consultative meetings, ensuring that all consultations took place in safe space during this difficult time of COVID-19 pandemic mitigation measures.

The Government of Uganda appreciates the generous financial and technical support from UNAIDS that supported this task. Technical support was made available by UNAIDS Regional Office for Eastern and Southern Africa through the UNAIDS Technical Support Mechanism managed by Oxford Policy Management and Genesis Analytics.



Dr Nelson Musoba
Director General, Uganda AIDS Commission Secretariat

Executive Summary

The Government of Uganda (GoU) through the Uganda AIDS Commission (UAC) with its national and international HIV/AIDS partners conducted a HIV investment case analysis during 2020 – 21 to build on progress made during the past decade, in order to inform optimised resource allocation for optimum HIV epidemic control during the next decade. The participatory process involved rounds of stakeholder consultations, analysis of HIV epidemiological data, costs and cost effectiveness of existing HIV prevention and treatment services, and mathematical model projections of the future course of the epidemic taking into account requirements for meeting national and international epidemic control targets for the decade.

This HIV Investment Case Framework summarises data on the magnitude and dynamics of the HIV epidemic in Uganda, especially for the general population and among high risk groups including key and priority populations. Although HIV incidence and new HIV infections dropped significantly during the past decade, it fell short of the Sustainable Development Goal (SDG) 3.3 target of 75% drop by 2020¹. Uganda achieved 52% and 60% drop in new infections and AIDS-related mortality respectively². 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 have very 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. Vertical infections also dropped, but remain high, at 5,600 in 2019, with virtual elimination yet to be attained. About 1.4 million adults are living with HIV in the country, with approximately 93% diagnosed, 92% enrolled on HIV treatment, and 84% achieved viral load suppression (VLS) by end of 2020. However, adult men and children, adolescents and key and priority populations are still lagging behind in the HIV testing and treatment cascade.

In the second part, the report summarises the achievements, efficiencies and evidence around eight critical interventions i.e. HIV testing, treatment, safe male circumcision (SMC), condom use, PMTCT, services for adolescent girls and young women (AGYW), services for KP/PP, and PrEP. In addition, data on critical enablers comprised of Social Behaviour Change Communications (SBCC), stigma and discrimination, and sexual and gender-based violence is also presented. The analysis noted that while progress has been made in recent years with HIV testing, treatment, and PMTCT, the roll out and uptake of safe male circumcision, condom use, behavioural interventions, interventions for AGYW, and services for KP/PPs remain sub-optimal. Scaling up these services and sustaining the gains made in the other services is critical to attainment of HIV epidemic control, and ultimately meeting national and international impact targets for the next decade.

Although the national response attracted significant resources from domestic and external partners during the decade, the total resource envelope fell short of requirements and funding gaps remained. This may have hindered attainment of programme targets.

Based on this epidemic context and coverage of HIV prevention and treatment services, various scenarios were considered for scale up during the next decade and their potential impact projected through Spectrum mathematical modelling. A prioritised and cost-effective scale up package was eventually selected that has the potential for significant impact on the course of the HIV epidemic and lead to attainment of national and international targets for the decade. This scenario envisages scale up of HIV testing and treatment, condoms during high risk, male circumcision, PMTCT and PrEP services. At the same time, there should be investment in social enablers including SBCC, AGYW, stigma and discrimination and violence prevention. This scenario and targets therein are projected to avert up to 130,000 new HIV infections and 51,000 AIDS related mortality compared to a scenario where the current coverage of services is kept constant at 2019 coverage.

¹ SDG

² MoH: The 2019 HIV Epidemiological Surveillance Report, March 2020, Kampala, Uganda

This prioritised package is estimated to cost US\$ 8.2 billion over the decade, 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. Some social enablers can be funded from other non-HIV resources. This scenario projects that it will be possible to scale HIV treatment and testing services within the current resource envelope in view of the cost saving measures such as targeted HIV testing and differentiated HIV services delivery models (DSDM).

The prioritised scale up scenario in this HIV investment case makes a compelling case for investment. The cost per infection averted will be \$ 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. This scenario stands to see reduced spending on HIV treatment in the future since the numbers in need of treatment will begin to fall mid-decade 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.

The investment case analysis makes it imperative for GoU and its partners to consider strategies for funding the HIV response to meet the targets for the decade. The first strategy is to maintain current funding levels from domestic and external sources. Now is not yet the time for any of the current funding sources to contemplate reduction in funding. Secondly, additional resources should be mobilised. In line with this, it is imperative for GoU to consider significant increase in its on budget allocation to health and HIV services in real terms, to at least meet the targets in the Abuja Declaration³. This is more compelling now as Uganda approaches attainment of lower middle income status that comes with limited external donor financing. The GoU should also 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, etc. Although GoU has prioritised the expected oil revenues to infrastructure development, funding of HIV services also makes a compelling case. The GoU should also mobilise additional resources from its current bilateral and multilateral external funding partners especially the US Government, the Global Fund, Irish AID, etc. This could be reinforced with soliciting funds from other multilateral and bilateral partners including the World Bank, African Development Bank, etc. This HIV investment case framework should support such initiatives.

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

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 HIV investment framework is intended to aide decision makers to prioritise HIV investment decisions during the decade. Potential users include the GoU including the Cabinet and Parliament, the national treasury and national planning authorities. It should also form the basis for national and sector HIV strategic and operational plans and funding decisions. Uganda's external and multilateral HIV and health funding partners should also find this framework an important basis for funding decisions. District local governments and other local government authorities should also base their priorities for HIV control on this framework. But the value of the framework should extend beyond Government, civil society advocates should also find a lot of value in this framework.

³ Abuja Declaration

Chapter 1: Strategic Context

This HIV investment case framework has been developed to inform a more strategic and targeted approach to investment in the HIV/AIDS response that will yield long term dividends. The framework will support planning towards ending AIDS as a public health threat by 2030 in line with global Sustainable Development Goal (SDG) 3.3⁴ target that Uganda has committed to under the new National HIV/AIDS Strategic Plan 2020/21 – 2024/25 (NSP)⁵ and the Presidential Fast-track Initiative on Ending AIDS in Uganda by 2030⁶.

It is recognised that as Uganda works towards sustainable HIV epidemic control, resources for the HIV response have continued to shrink as a result of the growing need amidst limited resources from domestic and external sources. This is also the case in many low and middle-income countries whose HIV resources have been inadequate and level in recent times. Uganda’s HIV epidemic response is largely funded by external donors, with domestic funding accounting for less than 40%. The Government support to the health sector has on average been 7-9% of the total government national expenditure budget in recent years, which falls below the Abuja Declaration commitment of at least 15%. This leaves significant funding gaps. This investment case framework will guide the allocative efficiency of these scarce resources and should help in mobilisation of additional resources by clarifying the returns on the investment.

HIV Investment Case Analysis

A National HIV Investment Case Analysis is a framework that provides guidance on the package of high priority, evidence-based, impactful and cost-effective HIV and AIDS interventions and their most efficient delivery mechanisms; which a country should invest in and implement to achieve the national goals for HIV epidemic control. HIV epidemic control is attained when the number of new HIV infections has decreased and fallen below the total number of deaths among HIV-infected individuals.

In resource-limited settings, countries have to look into efficiency savings to address some of the financing constraints. Although a key opportunity to finance the scale of the HIV response, efficiency savings are often complex to achieve, and take long to filter through to the budgeting process. The dilemma that is faced is how more sustainable funding towards HIV/AIDS response is to be achieved in light of competing public priorities, substantial investments already made in HIV response but against declining external funding. The HIV Investments framework, aims among others, to support this process.

1.1 Background and Strategic Context

The context of the current HIV Investment Case Framework is that the last one for Uganda was developed in 2014⁷; and since then, a lot of changes have taken place in form of new programme strategies and interventions that were introduced and implemented. Amongst these are the HIV “test and treat” strategy, differentiated HIV service delivery, targeted HIV testing, and HIV surge initiatives. Furthermore, more ambitious targets for HIV epidemic control were adopted than had been envisaged in the original investment case framework. An example of this is the change from the triple 90s by 2020 strategy to triple 95 by 2020. These initiatives render an updated HIV investment case analysis necessary for Uganda to guide strategic

⁴ SDG 3.3

⁵ Uganda AIDS Commission: The National HIV and AIDS Strategic Plan 2020/21 – 2024/25: April 2020, Kampala, Uganda

⁶ Presidential Fast-Track Initiative on Ending HIV & AIDS in Uganda: A Presidential Handbook, June 2017

⁷ Uganda AIDS Commission and Avenir Health: The Uganda HIV Investment case Analysis 2015 – 2020, February 2014, Kampala, Uganda

choices for HIV programme planning, resource mobilisation and investment during the next decade.

Over the last three decades, the national response to the HIV/AIDS epidemic has been guided by multisectoral and sectoral strategic plans. The Uganda AIDS Commission (UAC) leads in developing and guiding the multisectoral plans, while sectoral plans have been developed by the Ministry of Health (MoH) and some line Ministries. The current National HIV/AIDS Strategic Plan 2020/2021 - 2024/2025, the blueprint for implementation over the next five years was developed with participation of stakeholders. The overall goal of the plan is to increase productivity, inclusiveness and wellbeing of the population through ending HIV/AIDS by 2030. The plan underscores that the attainment of the overall goal is contingent on achieving the following outcomes by 2025: i) New HIV infections among adults and adolescents and young people reduced by 65%; ii) Mother to child HIV transmission (MTCT) reduced to less than 5%; iii) High quality services optimized to achieve 95% linkage to treatment; iv) Viral load suppression (VLS) in at least 95% of persons living with HIV/AIDS (PLHIV) enrolled on ART, v) Capacity of health and other service delivery systems optimized with maximum efficiencies for HIV services delivery.

In line with this, the NSP has defined a package of high-impact HIV prevention services that have to be rapidly implemented to scale in order for the country to attain the goal of ending the HIV/AIDS epidemic. The financial environment at the time of developing the plan led to prioritization and making pragmatic choices of the strategies and interventions based on estimated impact and cost effectiveness, informed in part by the modelling analysis that was conducted for this HIV investment case framework⁸. Furthermore, the understanding at the time was that the prioritization would continue during the period of the plan. This prioritization will be aided by completing this investment case analysis 2021 – 30.

1.2 Rationale for the HIV Investment Case Framework:

The current magnitude and dynamics of the HIV epidemic make a compelling case for prioritisation and intensified scale up of critical HIV prevention and treatment services taking into account the financing landscape. Programmes must be more strategic and focus on priority population groups, geographic areas and on cost-effective biomedical, behavioural, and structural interventions while drawing on synergies with broader health sector and development initiatives. As Uganda embarks on the next decade of intensified HIV epidemic control, systematic analysis of the evolving HIV epidemic, interventions and service delivery modalities in the national response, and the financing and economic landscape that was conducted for this investment case framework will guide the strategic choices and priorities required for sustainable HIV epidemic control.

Already, the modelling analysis⁹ for this framework already informed the development of the new NSP¹⁰, the concept note for the Global Fund grant application for 2021 – 23¹¹, and the PEPFAR Country Operation Plan 2020¹² (COP20). The analysis examined various investment scenarios and return on investments for the period 2020 – 2030 that goes beyond the timeframe of the new NSP. It constituted an important component of updating Uganda’s HIV investment case. The components of a comprehensive investment case that remained outstanding at the

⁸ Avenir Health: Modelling Analysis for the Uganda National HIV Strategic Plan: Draft Report, March 2020, Kampala, Uganda

⁹ Avenir Health: Modelling Analysis for the Uganda National HIV Strategic Plan: Draft Report, March 2020, Kampala, Uganda

¹⁰ Uganda AIDS Commission: Draft National HIV and AIDS Strategic Plan 2020/21 – 2024/25 (NSP): February 2020, Kampala, Uganda.

¹¹ Uganda Country Coordination Mechanism (CCM) for the global fund: priorities for the Global Fund Concept Note for the New Funding Mechanism 2021 – 23: Presentations to Stakeholders Meeting, March 2023, Kampala, Uganda

¹² PEPFAR Uganda Coordination Office: Overview Presentation of the Uganda Country Operation Plan (COP20) Priorities, Presentation to Stakeholders Meeting, February, Kampala, Uganda

time have since then been completed, namely: the epidemic analysis, the programmes and implementation analysis; and the costing and financing analysis.

1.3 Macro-Economic Outlook

Uganda has over the recent past posted an impressive economic growth rate averaging 6% except for last year which posted 2.9%. The COVID-19 pandemic has partly accounted for the slowed economic growth. While the country had projected 7.3% growth, the real gross domestic product (GDP) grew at 2.9% in fiscal year 2019/20 as compared to 6.8% in 2018/19. The GDP for the next two years are projected to remain depressed and grow at a similar levels. The COVID-19 related lock down in the country and within the region resulted in drop in the public investment and individual house hold consumption that affected manufacturing, and the service sectors. The medium-term outlook for Uganda shows a slow recovery of the economy, the country export sector, tourism and other foreign direct investment (FDI) remittances, and further depressed productivity will affect the speed of recovery for the domestic economic.

Ugandan oil sector, is expected to start production and exporting by 2024/25. The anticipated Oil revenues have been earmarked for the infrastructural development and the human capital development which are some of the cornerstones to a vibrant and sustained economic growth to lead the country to the middle-income status.

The attainment of the middle-income status will come with potential reduction in the global grants and AID receivables. The GoU will proactively reprioritise funds to sustain gains in the health sector, and the HIV response in particular. Before then, financing of this investment case framework requires support from GoU through the line and sector ministries, development partners and non-state actors including the private sector, civil society and local communities. There is need for a complementary principles of shared responsibility and global solidarity to ensure resources ate directed to address the resources gap and ensure sustainability of the programmes. The HIV investment case framework will be funded through the following funding mechanism, namely: i) GoU funding from both domestic revenues; ii) Donor support through the budget support; iii) a proactive engagement of the private sector and the out-of-pocket contributions from households. GoU will within the health sector ensure budget ring-fenced funds are gradually increased to match the needs.

Uganda needs to grow its HIV budget in tandem with GDP expansion as the country transits from a low-income developing country to a middle-income country with the possibility of having a gross national income in excess of US\$1,100. The GoU allocation to the sector should improve to at least 15% by the 2025 (in line with the Abuja Declaration of 2005). Increasing allocations to the health sector will be a key step, among others, toward improving health infrastructure and human resource gaps which are vital for improved service delivery.

1.4 Intended Users of the HIV Investment Case Framework

The main goal of this investment case framework is to aide decision makers to prioritise HIV investment decisions during the decade. The users will include the GoU especially the Cabinet, Parliament, the National Treasury, and national planning authorities. The Ministry of Health and Uganda AIDS Commission as well as other line ministries are expected to base their strategic and blue print HIV/AIDS plans and funding decisions on this framework. Uganda's external and multilateral funding partners for health and HIV response should also find the priorities in this framework an important basis for funding decisions. District local governments and other local government authorities should also base their priorities for HIV control on this framework. But the value of the framework should extend beyond governments, civil society advocates should also find a lot of value in this framework.

Chapter 2: Development of the Uganda HIV Investment Case Framework

The HIV investment case framework was developed through a consultative and data driven process, underpinned by emphasis on stakeholder involvement. It involve consultant led components comprised i) HIV epidemic analysis; ii) HIV programmes and implementation analysis; iii) the HIV modelling analysis; and iv) HIV programme costs and financing analysis. The activity was coordinated by Uganda AIDS Commission with technical and financial assistance of UNAIDS. The national steering provided oversight, while technical input was obtained viral thematic working groups.

The modelling component was conducted in January – February 2020 and the results were used in formulation of the NSP, PEPFAR Country Operational Plan, and the Global Fund Concept Note. The other three components were analysed in December 2020 – March 2021. All components involved extensive review of documents, technical consultations with thematic working groups, data collection and analysis. The ongoing COVID-19 pandemic limited involvement of sub-national level stakeholders especially district health teams, and dictated that all meetings were virtual, held over zoom. The methods for each of the four components were as follows:

2.1 Epidemic Analysis:

The epidemic analysis reviewed the current magnitude and dynamics of the HIV epidemic at national and subnational level, and the factors driving it in the various population and geographical subgroups. The participatory process involved working with the Technical Working Groups on M&E, surveillance and HIV/AIDS Estimates and technical officers of MoH/ACP, ADPs and Implementing Partner (IPs).

It involved analysis and triangulation of secondary data comprising of biological, behaviour, programme performance, demographic and population statistics. Secondary data on HIV prevalence, HIV incidence, sexual behaviour, estimates of other HIV indices such as mortality, risk factors, complications of HIV, viral load suppression, antiretroviral drug resistance, etc were obtained from published and grey literature including survey and programme and project reports, operational and strategic plans etc. The data was obtained from MoH, UAC, stakeholders, and online sources. In addition, raw data obtained from reporting and surveillance databases including the MoH online health management information (HMIS) platform – DHIS-2, reporting platforms and dashboards of projects and initiatives including PEPFAR’s HIBRID and DATIM, the HIV surveillance system etc, were also analysed to characterise the epidemic. Furthermore, recent population-based and facility-based surveys that incorporated biological and behavioural variables include UPHIA, DHS, longitudinal data from population cohorts in Masaka and Rakai, antiretroviral drug resistance surveys, surveys of key / priority populations, PMTCT Impact Assessment, etc. were obtained and analysed. These epidemiological data were generated by a wide range of stakeholders and also includes data on HIV testing, viral load suppression etc. The quality, and generalisability of the data was analysed and limitations taken into account. Limited key informant interviews were held with stakeholders.

Besides HIV incidence and prevalence estimates, non-HIV incidence / prevalence parameters such as numbers of adults and children living with HIV, new HIV infections, estimates of AIDS-related mortality, the triple 90 cascade, infections and AIDS mortality averted and other aspects of impact of HIV prevention and treatment efforts, and other similar parameters were also analysed using mathematical models in Spectrum¹³. Trend observation with previous

¹³ Spectrum modelling

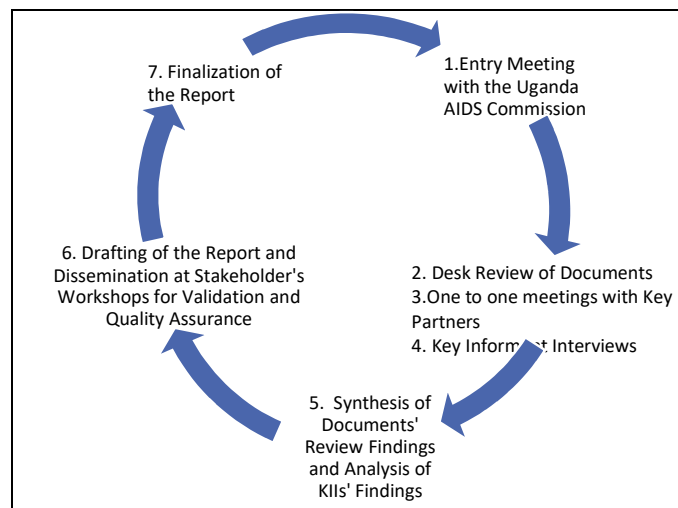
periods was undertaken. The estimates were obtained from a national spectrum file and presented with appropriate disaggregation by gender, demographic sub-groups and geographical areas. Small areas estimation methods within Spectrum such as Naomi¹⁴ and the District Estimates tool¹⁵ were used to obtain the estimates for sub-national level. Mathematical modelling involved working with the National HIV estimates team for Uganda that draws representation from MoH, WHO, UNAIDS, UNICEF, CDC, and UBOS. The estimates are presented with appropriate plausibility ranges.

Data on VLS represents which represents the third 90 in the HIV testing and treatment cascade was obtained from the VL dashboard of the VL testing programme and from UPHAI2016/17. Secondary analysis included trend analysis and comparative analysis of VLS among various population groups. Data to characterise the magnitude and dynamics of HIVDR was obtained from various sources including the HMIS, laboratory reports, 2015/16-UPHIA, PMTCT impact assessment, etc. Data on advanced HIV disease, HIV/TB and other concurrent morbidities were obtained from the reporting system. All these data were analysed and results included in the epi-review.

2.2 Programme Analysis

The HIV programme and implementation analysis assessed the evidence base for the various HIV prevention, care and treatment services in the national response, implementation strategies, current technical policies and guidelines for the services, evidence of their effectiveness and cost effectiveness, coverage and targets, as well as gaps in programme implementation. It was based on a combination of methodological approaches that included stakeholders’ meetings, desk review of documents, KIIs and consultation workshops, as presented below and a graphic presentation shown in Figure 2.1.

Figure 2.1: The process of the HIV Programme and Implementation Analysis



Stakeholders’ meetings: A series of meetings were held, commencing with an entry in brief in December 2020, and the out briefing meeting in March 2021. Subsequently, combined consultation meetings were held attended by the HIV Prevention, the HIV Care and Treatment; and the Social Support and Gender TWG. The meetings provided stakeholders with opportunities to give guidance, inputs and offer their buy-in.

Desk review of documents:

Documents related to HIV programme implementation were reviewed guided by a document review template. The documents were sourced from the client and partner organization, and online web-based sources. The review was conducted systematically following a thematic approach with the themes drawn in line with the existing key HIV prevention and control strategic areas.

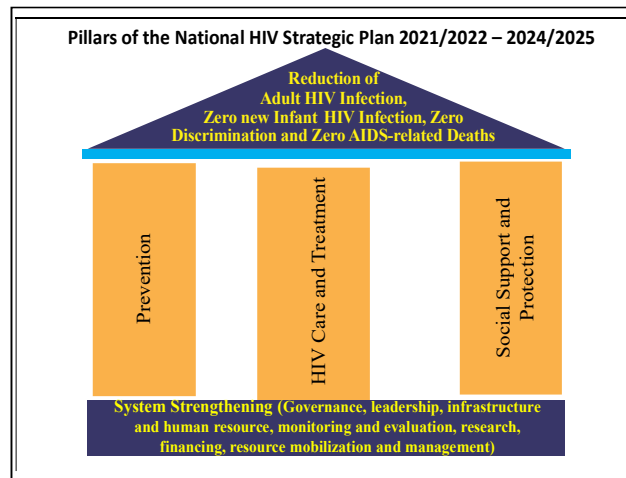
¹⁴ Naomi

¹⁵ District Estimates Tool

Key informant interviews: Where data was not readily available or was inadequate, key informant interviews were conducted to collect supplemental information. Gaps in data were especially identified in the area of disruption of HIV services by Covid-19 pandemic. In addition, KIIs enabled independent inputs from stakeholders and subject matter experts on priorities for the next decade. Participants of the KIIs were purposively selected and drawn from a wide range of organizations and institutions that included UAC, MoH, DHOs, HDPs and IP Organizations implementing HIV programmes. Data collected was analysed to highlight the level of disruption of HIV prevention and treatment services by the Covid-19. Mitigation measures that were taken to address the disruption of HIV services were also documented.

Consultation workshops: Consultation workshops were conducted to allow input and validation of the findings as a quality assurance, as well get recommendations from the stakeholders. The workshops were conducted online using Zoom.

The Analysis Frame: The main of the analysis was forward looking involving examination of the interventions specified under the three pillars of the NSP i.e. prevention, HIV care and treatment, and social support and protection. Gender issues apply to all the three pillars. The interventions were analysed for appropriateness, the evidence base that backed their choice, cost-effectiveness, adequacy of their targets, implementation approaches and their related technical efficiencies. The box below presents the critical interventions under the Prioritized Scale-Up Scenario of the NSP. Apart from the timeframe, the “Super Fast Track” interventions of the HSHASP 2017/2018 – 2022/2023 to align to this.



Additionally, the analysis looked at the HIV programme performance and their impacts, as well as bottlenecks in implementation. The Mid Term Review (MTR) of the NSP and the Joint AIDS Reviews (JARs) provided data for the analysis of the NSP HIV programme performance, impacts and challenges in implementation. In terms of HIV programme coverage and output/impact indicators, where possible, the most up to date information on the programme indicators were used to objectively assess the extent to which the HIV programme targets for the various services were met and their effectiveness.

- Strategic Direction of NSP 2020/2021—2024/2025**
- The NSP adopted the Prioritized Scale-Up Scenario with the following critical interventions for rapid scale up as roadmap to HIV control:
- HIV testing services (HTS)
 - Antiretroviral treatment
 - Condom distribution
 - Safe male circumcision (SMC)
 - Elimination of Mother-to-Child HIV Transmission (EMTCT)
 - Early Infant Diagnosis (EID)
 - Programs for key populations (KPs)
 - Socio-Behavioural Change Communication (SBCC)
 - Programs for stigma and violence prevention
 - Interventions targeting adolescent girls and young women (AGYW)

Also, cognizant that the public health HIV response led by the Ministry of Health (MoH) is a leading component of the multi-sectoral response, analysis of the core indicators specified in the Health Sector HIV and AIDS Strategic Plan (HSHASP) 2018/19 – 2022/23¹⁶. The plan has

¹⁶ Health Sector HIV and AIDS Strategic Plan (HSHASP) 2018/19 – 2022/23

46 core indicators for measuring programme impact, progress in programme monitoring and health system strengthening. Of these, 38 are programme indicators for monitoring the progress in implementation of prioritised interventions in four thematic areas.

Finally, information generated using the above different methodological approaches were triangulated. Synthesized information from the review formed the basis for recommending the packages of interventions to be considered for investment in the next 10 years.

2.3: The modelling Analysis:

The Goals model in Spectrum was used to estimate the cost, impact and cost-effectiveness of alternative HIV investment strategies in Uganda. The methods, data, and assumptions are described below. The scenarios analysed were defined through discussions with stakeholders.

The Goals model, a module implemented in the Spectrum modelling system that estimates the impact of future prevention and treatment interventions. The model divides the adult population 15-49 by sex and risk group. It was set up for Uganda using all available data sources to specify the distribution of the population by age and risk group and behaviours by age and risk group.

The Goals model also has an impact matrix that summarizes the impact literature to describe changes in behaviour by risk group as a result of exposure to behaviour change interventions¹⁷. The model calculates new HIV infections by sex and risk group as a function of behaviours and epidemiological factors such as prevalence among partners and stage of infection. The risk of transmission is determined by behaviours (number of partners, contacts per partners, condom use) and biomedical factors (ART use, male circumcision, prevalence of other STIs). Interventions can change any of these factors and, thus, affect the future course of the epidemic.

The Goals model is linked to the AIM module in Spectrum that calculates the effects on children (0-14) and those above the age of 49. The AIM module also includes the effects of programs to prevent mother-to-child transmission on paediatric infections. Additional details on the Goals and AIM models are available from several publications^{18,19}.

Data and assumptions:

Epidemiological data are from the AIDS Indicator Surveys (2004 and 2011), UPHIA 2016-17, and the 2020 Spectrum/AIM file. The AIM estimates are based on surveillance, survey and routine ANC testing data on HIV prevalence as well as program data on coverage of PMTCT and ART. Behavioural data are drawn primarily from the Uganda DHS 2016 and UPHIA. Size estimates for key populations are based on the recent size estimates report²⁰.

International studies are used to set values of the epidemiological parameters such as the risk of HIV transmission per act and the variation in the risk of transmission by stage of infection, type of sex act, presence of other STIs, use of condoms, etc²¹.

¹⁷ Bollinger LA, How can we calculate the “E” in “CEA” *AIDS* 2008, 22(suppl 1): S51-S57.

¹⁸ Stover J, Hallett TB, Wu Z, Warren M, Gopalappa C, Pretorius, et al. How Can We Get Close to Zero? The Potential Contribution of Biomedical Prevention and the Investment Framework towards an Effective Response to HIV *PLoS One* 9(11):e111956. doi:10.1371/journal.pone.0111956.

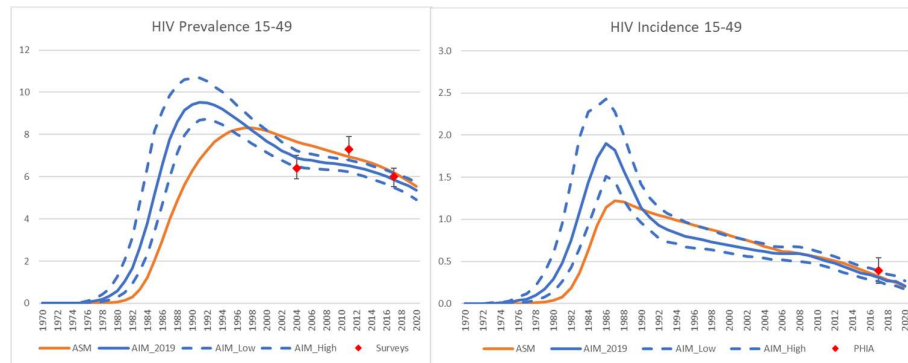
¹⁹ Stover J, Andreev K, Slaymaker E, Gopalappa C, Sabin K, Velasquez C et al. Updates to the Spectrum model to estimate key HIV indicators for adults and children *AIDS* 2014 28 (Suppl 4):S427-S434.

²⁰ UAC, Synthesis, Consolidation and Building Consensus on Key and Priority Population Size Estimation Numbers in Uganda, Final Report, December 2019.

²¹ Marie-Claude Boily, Rebecca F Baggaley, Lei Wang, Benoit Masse, Richard G White, Richard J Hayes, Michel Alary Heterosexual risk of HIV-1 infection per sexual act: *Lancet Infect Dis* 2009; 9: 118–29.

Estimates of the current coverage of interventions are based on a variety of sources, relying mainly on the PEPFAR Country Operational Plan, 2019 as shown in Annex 1. The model is fit to the historical pattern of prevalence in order to replicate the epidemic dynamics, Fig. 2.3.

Figure 2.3. Model fit to survey data and AIM trends



Unit costs for key interventions are from national sources (PEPFAR Expenditure Analysis, special studies, National AIDS Spending Assessments) and rely on regional estimates when national figures are not available. We assume that unit costs remain constant for most interventions except treatment. Since treatment accounts for the largest share of expenditures, it is important to consider the costs of the treatment program in detail. Our current assumptions for unit costs are:

Component	Cost per patient per year
First line ARVs: TDF+3TC+EFV	\$68
Second line ARVs	\$300
Service delivery	\$82
Laboratory	\$68
Percent of patients on second line	3.5%

Transition to TLD: The global negotiated price for TLD is \$75 per patient per year. The current price for TLE is actually lower, at just \$68. So, there is likely to

be only small changes in the cost of ARVs due to the transition to TLD. Of course, ARV costs may decline in the future if the prices for current regimens decline further or new, less expensive ARVs, such as TAF, become available.

Differentiated service delivery: In 2017, the EQUIP study²² examined the potential cost savings from implementing differentiated service delivery. They estimated the cost of ART delivery for seven categories of patients: stable adult facility-based, stable adult community-based, key and priority populations, children and adolescents, complex cases (new patient, those with symptoms and those with unsuppressed viral load), HIV+ pregnancy women with known infection, and HIV+ women with unknown infection. They assumed that stable patients would need fewer annual visits (2 per year), and fewer adherence counselling sessions (4 per year) than the current guidelines (6 per year for both) and that visits for key populations and children/adolescent could be reduced from 6 to 4 times per year. These assumptions suggest that the average cost for all patients could be about 11% less (\$258 versus \$290) with the DSD model. About 36% of ART clients were already on DSD by 2019. Expansion to all remaining patients would represent annual savings of about \$15 million.

Table 2.2. Costs per patient per year

²² Guthrie T, Zikusooka C, Musinguzi J, Kirungi W, Nabukalu B, Kanoowe S, Lagony S, Balyejjusa S, Stover J, Long L and Rosen S for the Ugandan EQUIP Test and Treat Modelling Group. Cost and outcomes of ART scale-up in Uganda. Johannesburg: USAID EQUIP Policy Brief, 2016.

Patient Type	Cost per patient per year	Proportion of all patients
Stable adult, facility-based	\$198	84%
Stable adult, community-based	\$215	
Key/priority populations	\$290	5%
Children and adolescents	\$337	5%
Complex patients (adults)	\$709	6%
Complex patients (children)	\$981	
Average for all patients (DSD)	\$258	
Average for all patients (current approach)	\$290	

2.4 Financing / Economic Analysis

The Financial and economic analysis were conducted to provide highlights of the funding, the operational and contextual circumstances for the response including the sources of funding, distribution of resources across the broad programs, key achievements, challenges and emerging issues that were identified in the course of the assessment. The Financing and economic analysis was conducted using a combination of methodological approaches. The approaches included review of documents, stakeholders' engagements, consultations, key informant interviews as described below.

Desk review of documents: A review of literature and documents was conducted with a focus on the resource's management. The key documents reviewed included; NSP 2015/16-2019/20, National Priority Action Plan (2017/18 – 2019/2020), The HIV Investments case 2015-2025; the Annual JAR reports for 2015/16-2019/20; NSP MTR reports; (2015/16-2019/20), The Country Progress Reports (2017-2019), NASA Reports (2014-2020). Others included the USG CoPs (2016-2020, Developments and Agency annual country plans, the annual GoU Budget framework papers by MoFPED and funding reports, among others. On line documents and reports provided vital information for this report.

Stakeholders' meetings: The stakeholder engagement included an entry meeting with the Coordination entity, the committee members who provided a comments and inputs to the IR and overall road map for the assignment. The key informants interview includes engagements with officials from the MoH, MGLSD, MFED, UAC, and the development partners. Others include the Civil society organizations and key affection persons.

Consultation workshops: Consultative workshops were conducted with a wide spectrum of participation who provided critique and suggestion on the direction for the new investments.

Data collection Analysis and reports: A mix of data collection of methods was used to obtain primary financial data. The methods desk review of existing resource documents and other secondary data, technical briefings form UAC, MoH and other stakeholders.

Data Analysis and Reporting: Data sets were compiled and re-analysed to generate a funding analysis that centred on the resources for the response, resource utilisations and as well as the funding trends for the response. The draft report was reviewed by stakeholders and partners at various levels to validate the findings and recommendations of the report.

2.5 Synthesis:

The findings were harmonised and reconciled between components. The final reports were presented and discussed by the core task team involving representatives of UCA, UNAIDS and the consultants to pave way for synthesis. Following presentation of the thematic reports, consultants synthesised the four component reports and prepared a joint report that was presented and validated by the Steering Committee.

Chapter 3: The HIV Epidemic Context:

Uganda made tremendous progress in achieving sustained reduction in new HIV infections and HIV incidence, as well as HIV/AIDS related morbidity and mortality in most population groups during the past decade. However, current levels are still high and the SDG targets for 2020 that envisioned reduction of new HIV infections and AIDS-related by 75% by 2020 were not met. In addition, there are some population groups and geographical hotspots where new HIV infections and HIV prevalence remain high - almost ten-fold that of the general population.

3.1 New HIV Infections and HIV Incidence Remain High but Dropping

The epidemiological data on HIV incidence that was available is based on indirect methods, principally mathematical modelling and HIV incidence assays of cross sectional samples, with direct estimation available only for some population groups. Based on the 2020 Spectrum estimates, new HIV infections in the country dropped by 58% during 2010 - 20, falling short of the target of a 75% reduction, Figure 3.1. The drop in new HIV infection was most marked

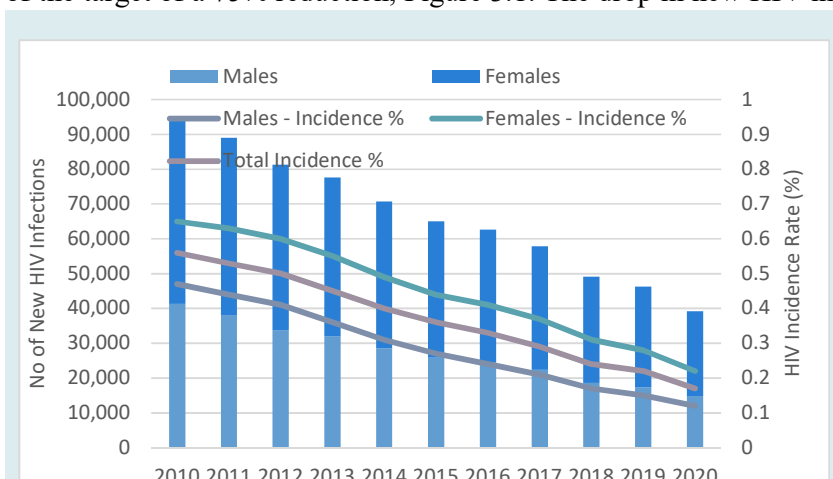


Fig 3.1: Trend in the Number of New HIV Infections of all ages and HIV Incidence Rate Among Males and Females Aged 15 – 49 years 2010 – 2020
[Source: Spectrum file]

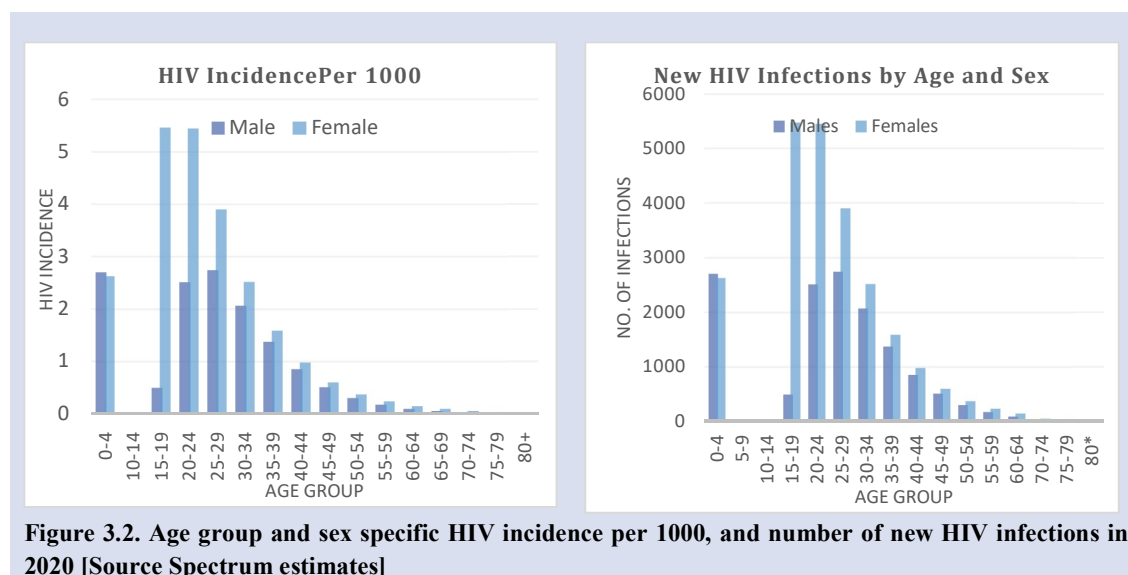
among women who in the first instance had a higher levels. The corresponding HIV incidence trends among men and women of reproductive age (15 – 49 years) are shown on the secondary axis. Since the 2020 targets were not met, intensified efforts will be required to significantly reduce HIV incidence to meet the targets for the next decade.

Young people aged 15 – 24 years accounted for more than one-third of new HIV infections (36%) in 2020, although this along with HIV incidence also declined during decade. Among young people, new HIV infections fell from 30,200 in 2010 to 14,000 in 2020, while HIV incidence dropped from 0.54% in 2010 to 0.16% in 2020. Among young women and their male counterparts, new HIV infections dropped from 22,000 to 10,900 during 2010 – 2020, and from 8,135 to 3,100 respectively. Within this age group, young women accounted for a nearly four in one (78%) of the new HIV infections. This age group currently constitute the focus of HIV programmes for adolescent girls and young women (AGYW) especially under the Determined, Resilient, Empowered, AIDS-Free and Mentored and Safe (DREAMS) projects supported mainly by the Global Fund, PEPFAR and Government of Uganda (GoU). These efforts should continue to expand during the next decade. Mathematical modelling as part of this investment case analysis has shown that up to 43,000 new HIV infections may be averted in this age group alone if ambitious targets for DREAMS interventions are attained during the decade – see Figure 5.4 later in this document.

Table 3.1: Estimated Number of New HIV Infections in Uganda in 2020

Population group	Estimated New Infections	95% Plausibility Range		Percent of Total	Percent within Category
All Age Groups	39,194	29,383	- 54,946		
Males	14,771	11,128	- 21,137	37.7%	
Females	24,423	18,160	- 34,114	62.3%	
15 – 49 years	30,262	21,481	- 43,252	77.2%	
Males	10,386	7,349	- 14,896		34.3%
Females	19,877	14,304	- 28,002		65.7%
50+ years	1,445	530	- 3,246	3.7%	
Males	589	204	- 1,986		40.8%
Females	856	314	- 1,690		59.2%
14 – 24 years	14,006	8,843	- 20,044	35.7%	
Males	3,097	694	- 4,931		22.1%
Females	10,909	6,769	- 15,938		77.9%
10 – 19 years	6,119	1,762	- 11,431	15.6%	
Males	496	37	- 1,184		8.1%
Females	5,623	917	- 10,161		91.9%
0 – 14 years	7,487	6,080	- 11,329	19.1%	
Males	3,796	3,083	- 5,745		50.7%
Females	3,690	2,997	- 5,584		49.3%

The age group specific HIV incidence estimates are summarised in Figure 3.2 below, which again highlights the disproportionate HIV incidence born by adolescent girls and young women aged 15-24 years compared to any other age group. In this age-group, HIV incidence exceeds by far that of their male counterparts, further justifying the relevance of focus on this age group if sustainable HIV epidemic control is to be attained.



Based on these estimates, and applying small area estimation methods in Naomi model, the distribution of the number of districts by level of HIV incidence among adults of reproductive age is summarised in Figures 3.3 below. The five districts with the highest HIV incidence among adults based on these estimates are Kalangala, Gulu, Kabarole, Mbarara and Masaka while the five districts with the lowest HIV incidence are Terego, Yumbe, Maracha, Kotido and Nabilatuk. The Five districts with the highest number of new HIV infections are Kampala, Wakiso, Mukono, Kabarole and Mbarara, and those with the lowest number of new HIV

infections are Nabilatuk, Karenga, Obongi, Butebo and Nepak. This geographical distribution may have important considerations for geographical prioritisation of HIV epidemic control in view of resource constraints.

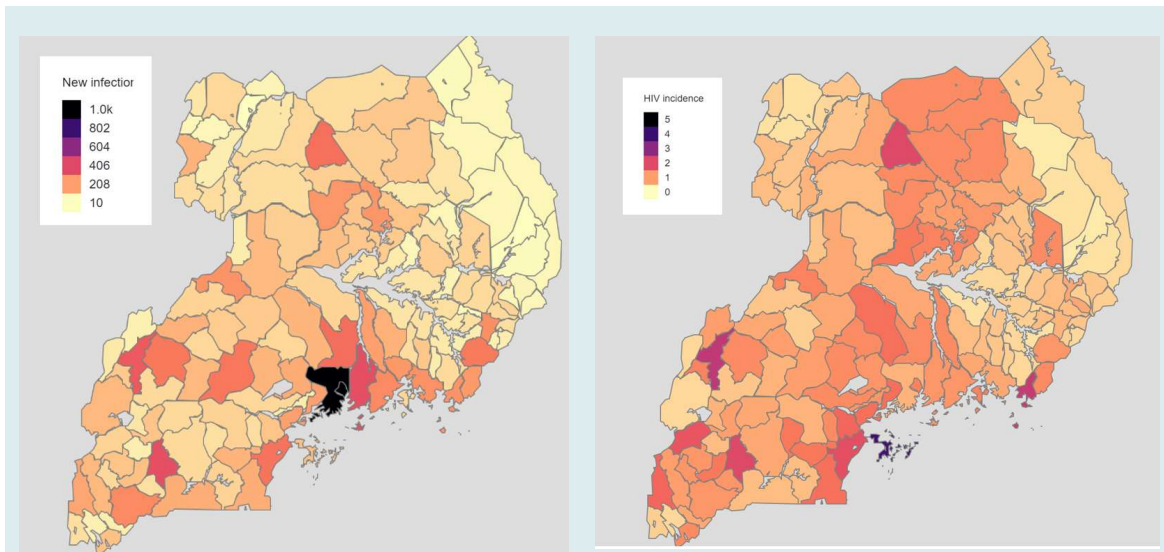


Figure 3.3. Distribution of new HIV infections [Left] and HIV incidence [Right] by District in Uganda 2020

3.1.2: HIV Incidence Estimates from Population-based Surveys

The HIV incidence estimates obtained from the 2016/17 UPHIA survey were consistent with Spectrum estimates. In these surveys, HIV incidence was based on the LAg avidity assay, VL and ARV algorithm. The estimated HIV incidence among adults aged 15-64 years was 0.40% (95% CI: 0.25%-0.56%); (0.35% among men, and 0.46% among women). Annual HIV incidence peaked among men aged 35-49 years (0.47%), and among women aged 25-34 years (0.63%), Figure 3.5 below. HIV incidence among adults aged 15-49 years was 0.39% (95% CI: 0.24%-0.54%); 0.31% among men, and 0.47% among women, Figure 3.4. Another survey is currently underway and will provide updated statistics later in the year.

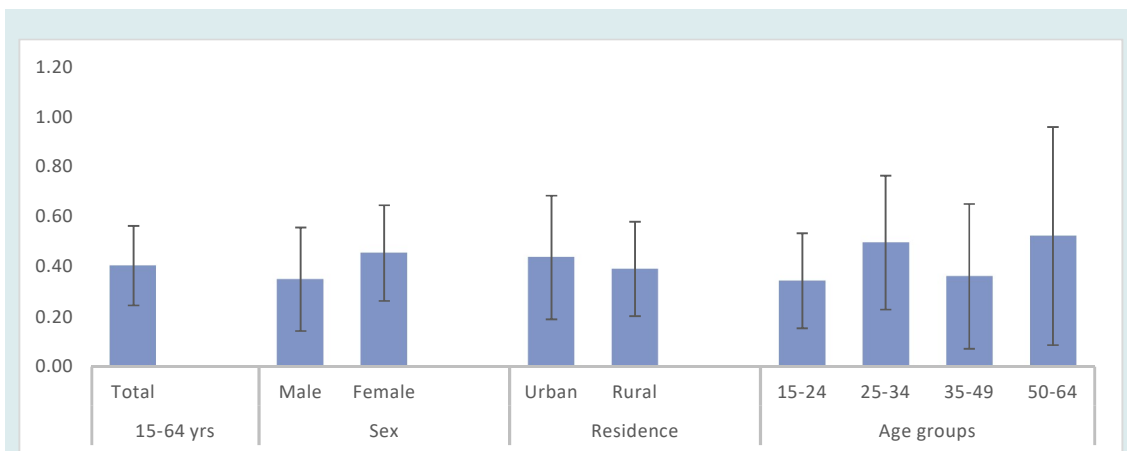


Figure 3.4: HIV Incidence Estimates Among Adults in Uganda 2016/17 based on the LAg Avidity Assay [2016/17 UPHIA]

Urban Residents had a marginally higher incidence of HIV, 0.44% (CI 0.20% - 0.68%), compared to 0.39 (CI: 0.21% - 0.58%) in rural areas. Urban women had almost two fold the HIV incidence of their rural counterparts 0.69% versus 0.36%. The converse was true with rural men having almost two fold the HIV incidence of urban men (0.43% versus 0.15%), Table 3.2 below. Based on these data, it appears that urban women should constitute a focus of targeted high impact HIV prevention services.

Table 3.2: Annual HIV Incidence among Men and Women in Rural and Urban Areas in Uganda in 2016/17 [Source UPHIA 2016/17]

Area	Age	Male		Female		Total	
		% Annual Incidence	95% CI	% Annual Incidence	95% CI	% Annual Incidence	95% CI
Urban	15 – 49	0.16	0.00-0.39	0.72	0.29 – 1.14	0.46	0.20–0.70
	15 – 64	0.15	0.00-0.36	0.69	0.29 – 1.09	0.44	0.20-0.68
Rural	15 – 49	0.37	0.13-0.61	0.36	0.15 – 0.58	0.37	0.19-0.55
	15 – 64	0.43	0.16-0.69	0.36	0.16 – 0.56	0.39	0.21-0.58

3.1.3: HIV Incidence among Key and Priority Population:

Available epidemiological data shows that HIV incidence among some populations groups in the country such as sex workers, fishing communities, people in prison incarceration, etc, still exceeds that in the general population by 3 – 20 fold. For instance, a baseline study by MRC among HIV-negative high-risk individuals in a fishing community on the shores of Lake Victoria that aims to establish a high-incidence cohort for future HIV vaccine trials reported HIV incidence rate in this group that was almost 10 fold that of the general population, i.e. 3.3 / 100 person-years (PYs)²³ in 2019. The HIV incidence rate among sex workers was 4.8 / 100 PYs; bar / lodge / saloon workers, 6.4/100 PYs; and the female population in this community 5.2/100PYs, Figure 3.6. This study highlights the disproportionate burden of HIV among the often invisible or unrecognized group of women and that work in entertainment / recreation

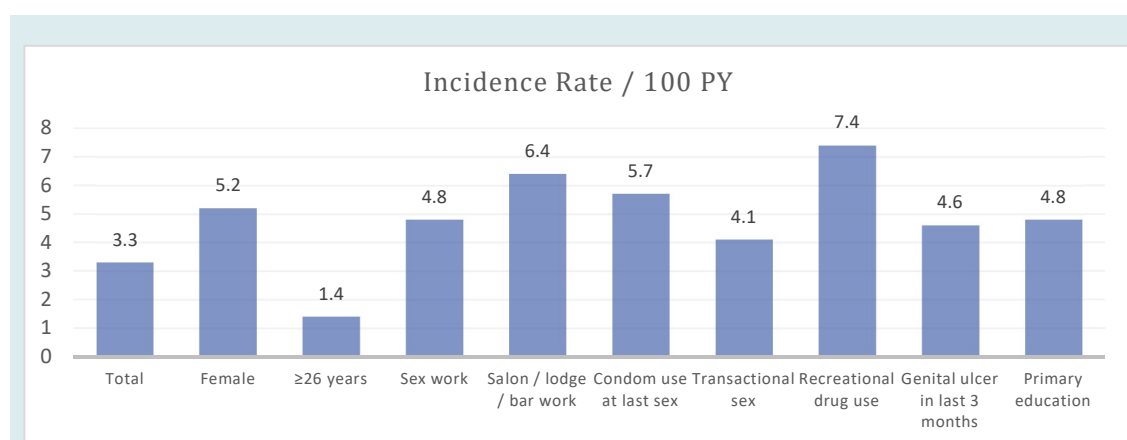


Figure 3.5: HIV Incidence among high risk populations on the shores of Lake Victoria in Masaka District [Source MRC]

²³ MRC: Baseline Assessment among High-risk Populations in Preparation for HIV Vaccine Trials

industry (6.4%). This group is not the current the focus of HIV prevention programmes for the general population nor for key and priority populations.

Another study, the Medical Research Council (MRC) Good Health for Women Project (GHWP) enrolled 4,817 female sex workers aged 15 – 49 during 2013 – 19 from slum areas of Kampala, and found HIV prevalence of 36%²⁴. HIV Incidence among the women owing to HIV prevention interventions declined from 4.0 /100 PYs during 2013 – 14 to 2.7 /100 PYs during 2016 – 17.

Another study – a bio-behavioural survey by the Uganda Prisons Service (UPS) of prison inmates and prisons service workers in 2015 also determined HIV incidence using cross-sectional samples based the

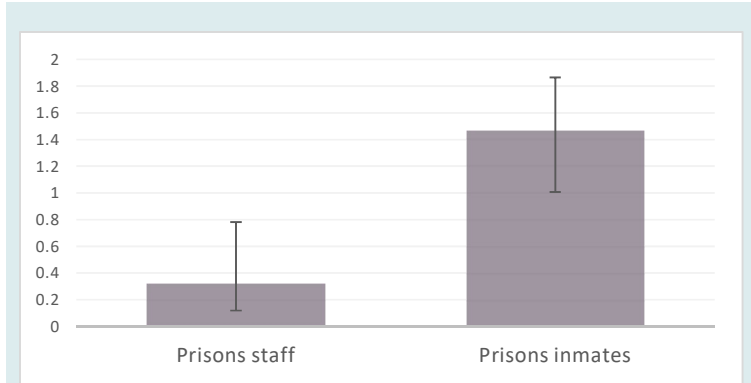


Figure 3.6 HIV Incidence among prisons staff and prisons inmates 2013-14 [Source Uganda Prisons Service Survey Report, May 2019]

LAG avidity assay. In this study HIV incidence among prison inmates was high, i.e. 1.462% (CI: 1.462% – 1.465%) almost 3 – 4 fold that of the general population²⁵, Figure 3.7. Among prisons staff, the HIV incidence was similar to the general population, 0.320% (CI 0.319 – 0.322). The high incidence and prevalence of HIV in prisons setting, calls for special tailored HIV prevention services suited to the unique settings of incarceration and for specific HIV

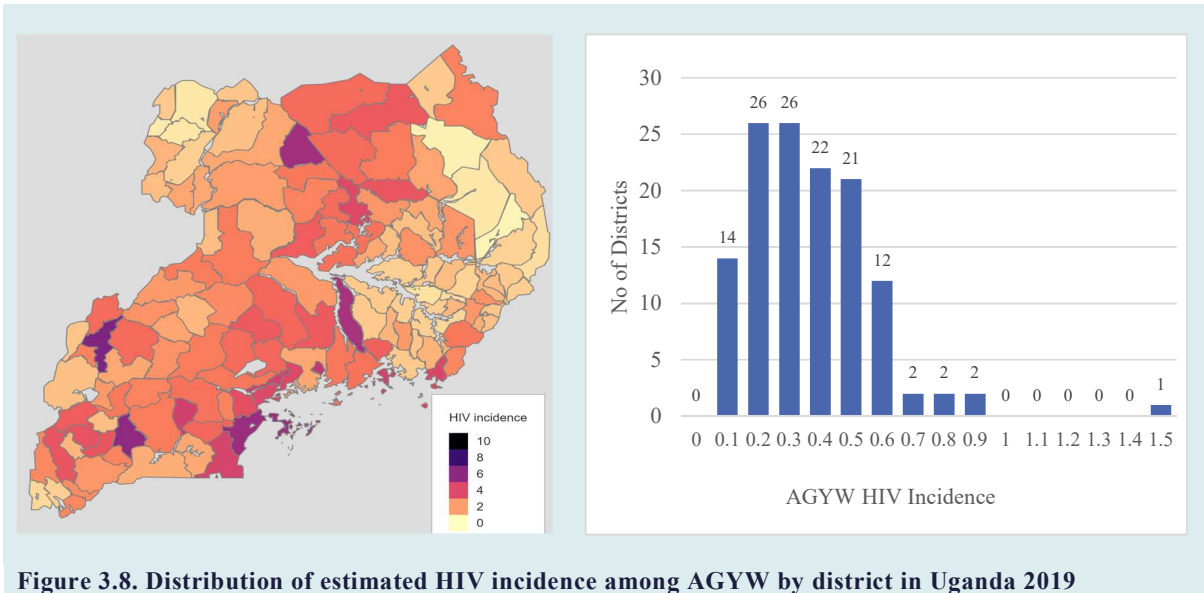


Figure 3.8. Distribution of estimated HIV incidence among AGYW by district in Uganda 2019

²⁴ MRC: Good Health for Women Project

²⁵ UPS Study

measures upon subsequent discharge of the inmates before reintegration in the general population.

As already pointed out in this section, adolescent girls and young women bear disproportionate HIV incidence on account of the high levels of vulnerability to risky sexual behaviour. Based on the Naomi Model small area estimation methods in Spectrum, district HIV incidence among AGYW was determined for the 135 districts. The distribution of the districts by level of the HIV incidence in 2019 among AGYW is summarized in Figure 3.10. Based on these estimates, 60 districts had HIV incidence among AGYW of at least 0.4%. Kalangala district stands out as having the highest HIV incidence among AGYW as shown in the figure. Based on these estimates, the geospatial distribution of HIV incidence among AGYW in 2020 is also shown in the same figure. These statistics may be used to determine prioritisation of districts for tailored DREAMS-like interventions for AGYW.

3.1.4 HIV Incidence among Lactating Women

The PMTCT Impact Assessment study conducted by Uganda Ministry of Health and RHSP in 2018-19 determined HIV sero-conversion among postpartum women enrolled at 4 – 6 weeks postpartum in a nationally representative sample of health facilities. Postpartum sero conversion was based on serial HIV serological testing every 3 months from the 6th month following enrolment. The high rates of sero conversion established as shown in Figure 3.9.

The high level of sero-conversion among post-partum women was hitherto only estimated in Spectrum mathematical models, and is one of the factors contributing to persisting high vertical transmission during breast feeding (section 3.4.2). The factors accounting for the high HIV incidence among pregnant and lactating mothers need further exploration. Tailored interventions including repeat testing of pregnant and postpartum mothers, PrEP among pregnant and breast feeding women²⁶, appear to be necessary, among other measures in the PMTCT 4-pronged strategy.

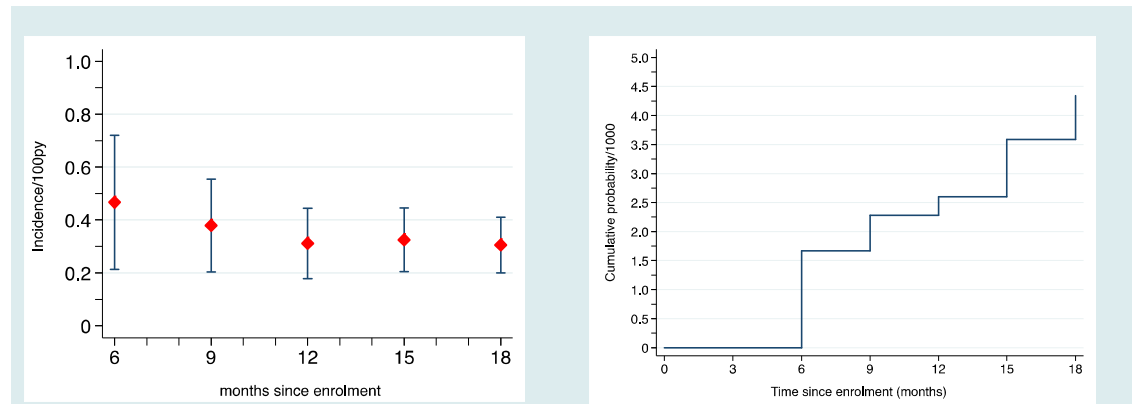


Figure 3.9: Probability and Cumulative Probability of Post-partum HIV Sero-conversion among post partum women in Uganda's HIV Impact Assessment Survey

3.2 HIV Prevalence and HIV Burden

HIV prevalence in the general population of Uganda remained largely level during the past decade, ranging from 6 – 7% although the total HIV burden continued to grow in part due to

²⁶ COP guidance

population growth. Uganda has not yet attained HIV epidemic control where new HIV infections would fall below all-cause mortality among HIV-infected individuals for the number of PLHIV to cease to increase year on year. HIV prevalence in Uganda remains generalised, but heterogeneous across socio-demographic, economic and geographic subgroups, with some geographical hotspots of elevated HIV prevalence. In this synthesis, HIV prevalence data based on representative population samples was used to describe HIV burden.

3.2.1 HIV Prevalence in the General Population:

The 2016/17 UPHIA provides the most recent empirical data on HIV prevalence in the general population, since data from the ongoing UPHIA2020 will not be available till end of this year. Based on this survey, HIV

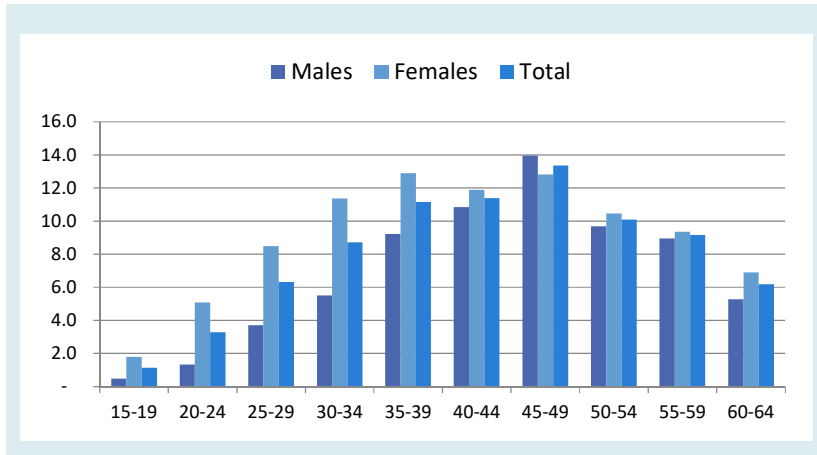


Figure 3.10: HIV Prevalence by age group among adults in 2016/17 UPHIA

prevalence among adults aged 15 – 49 years countrywide was 6.0%, and 6.2% among those aged 15 – 64 years but may have fallen below this in recent years. Among children aged 0 – 14 years, HIV prevalence was 0.5 percent. HIV prevalence among women exceeded that in men (4.7% vs 6.7%) and this was the case in all geographical regions of the country. Urban

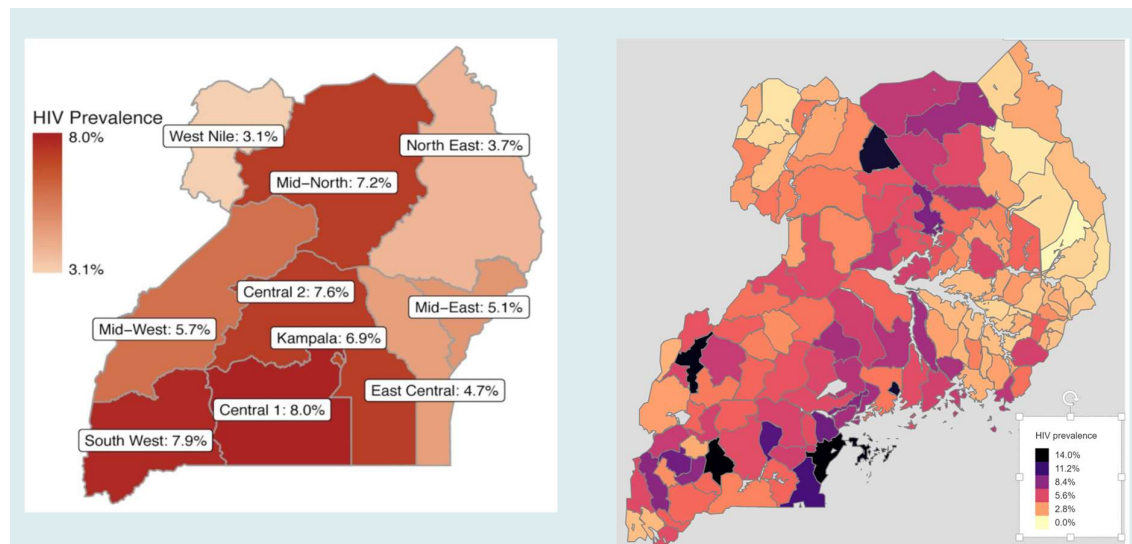


Figure 3.11 HIV Sero-prevalence among adults 15 – 64 years in the various regions of Uganda and at district level: [Source UPHIA 2016/17 and Naomi Model Estimates 2020]

residents were more disproportionately affected than their rural counterparts (7.7% vs 5.8%). HIV prevalence among young people 15 – 24 years was 2.1 percent, and consistent with

previous statistics, HIV sero-prevalence among young women exceeded that of their male counterparts by four fold (0.8 versus 3.3 percent) in this age group.

The prevalence of HIV increased with age among adults, with peak prevalence among women attained in the age group 35 – 45 years, while the peak among men was attained at 45 – 49 years, Figure 3.11. The prevalence of HIV among women exceeds than among men in all age groups except for the age-group 45 – 49 years.

The geographical heterogeneity of HIV prevalence in Uganda demonstrated in 2016/17 UPHIA and the recent Naomi model small area estimates Figure 3.12. HIV sero-prevalence among adults aged 15 – 64 years ranged from the highest of 8 percent in South Buganda (Central 1) and South West Uganda, to a lowest of 3.1% in West Nile region. The high prevalence belt cut across from the mid-north through central regions to the south western region. However, small area estimation methods show that even among regions, there is heterogeneity among districts with some districts within relatively low prevalence regions having high prevalence. At the same time, some districts within high HIV prevalence regions having relatively low prevalence.

HIV sero-prevalence also varied by other socio-economic and demographic and, behavioural covariates. These variations are described in the main survey report²⁷. For instance, HIV sero-prevalence among pregnant women at the time of the survey was 5.7% versus 7.8% among women that were not. This is important from the antenatal HIV surveillance point of view.

3.2.2 Trends in HIV Prevalence in the General Population

Trends in national HIV prevalence among adults, may have remained level at 6 – 7% during the past decade following a decline in 1990s as HIV treatment has rolled out across the country.

The level trends in HIV prevalence among adults in the country during the past one and half decades is also reflected in the three previous population-based surveys Figure 3.12. However,

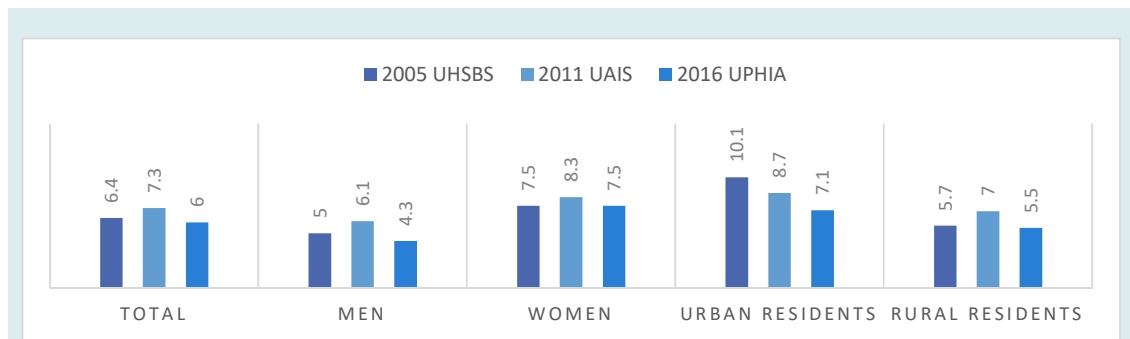


Figure 3.12: Comparison of HIV seroprevalence among adults in 3 previous HIV population surveys

trends differ among population sub-groups, for instance, it appears that among urban residents, there has been a consistent decline in HIV sero-prevalence.

3.2.3 HIV Burden:

The HIV burden in Uganda estimated at approximately 1.46 million [plausibility limits 1.41 – 1.61] in 2020 has grown throughout the decade and is expected to level off and start declining

²⁷ MOH: Uganda Population-based HIV Impact Assessment (UPHIA) 2016-17, Final Report. Kampala: Ministry of Health; July 2019

after Uganda has attained HIV epidemic control. Annual estimates of HIV burden for 2020²⁸ are summarized in Table 3.3.

Table 3.3: Estimates of HIV Burden, New HIV Infections and AIDS-related Mortality in Uganda:

Parameter	Number	Plausibility Range		Percent	Percent within Sub Group
People living with HIV					
		Lower		Upper	
Total	1,461,370	1,367,859	-	1,610,130	
Men	579,318	532,661	-	646,938	40%
Women	882,052	769,780	-	958,117	60%
15 – 49 years	1,109,232	1,007,582	-	1,147,919	76%
15 Years +	1,359,074	1,224,229		1,457,232	93%
50 years +	245,684	145,584		428,215	17%
15 – 24 years	176,524	232,765	-	232,765	12%
10 – 19 years	103,857	76,467		124,451	7%
0 – 14 yrs	102,296	88,893	-	110,148	7%
HIV-Related Deaths					
Total	21,267	14,791	-	27,924	
Men	12,435	7,767	-	16,554	58%
Women	8,832	5,682	-	12,253	42%
15 – 49 years	12,942	9,536	-	16,180	61%
15 years +	16,440	12,007		21,779	77%
50 years +	3,238	1,873		7,426	17%
15 – 24 years	2,400	1,590	-	3,107	12%
0 – 14 years	4,828	3,494	-	6,087	23%

Of the approximately 1.46 million people living with HIV in Uganda in 2019, 93% were adults aged 15 years+. Young people 15 – 24 years constituted 12 percent, and approximately 17% of PLHIV were aged over 50 years. Among all age groups, women bear disproportionate burden relative to their male counterparts. The geographical burden of HIV at district and regional level based on the Naomi model and Spectrum estimate is shown in Figure 3.13. The five districts with the highest burden, and those with lowest burden are also shown.

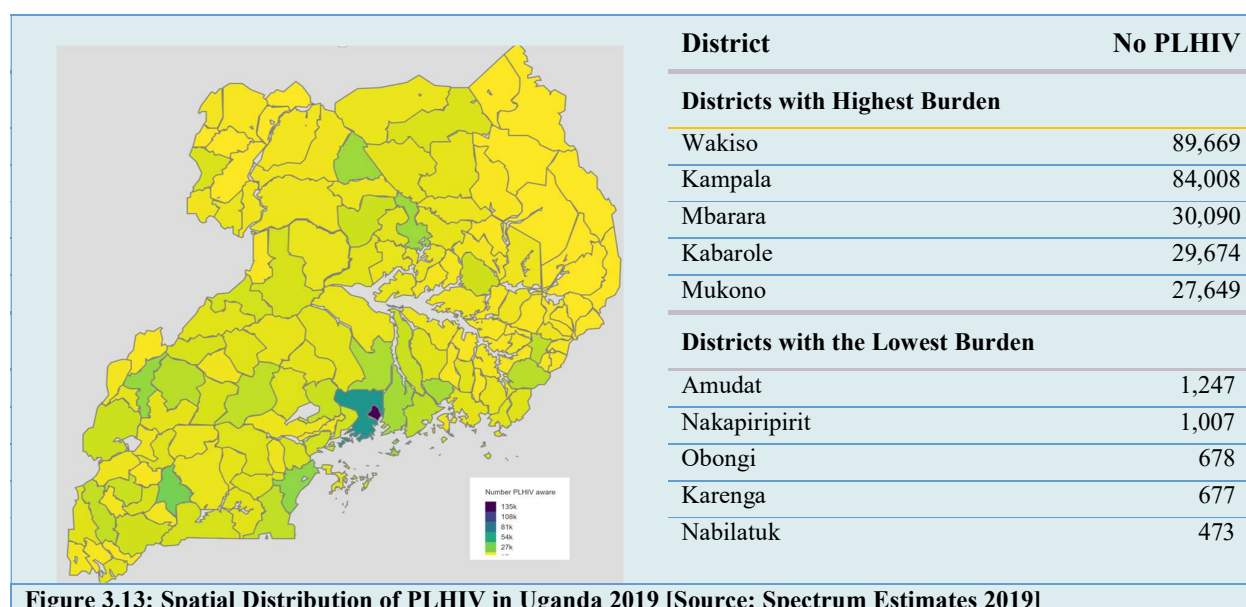


Figure 3.13: Spatial Distribution of PLHIV in Uganda 2019 [Source: Spectrum Estimates 2019]

²⁸ National Estimates are made by the Uganda HIV Estimates working group comprised of representatives from MoH, CDC,UNAIDS, WHO and UNICEF with technical assistance from Avenir Health, UNAIDS, and Imperial College London

The estimated number of PLHIV in the country has continued to grow over the past decade. However the rate of growth has slowed down in recent years as Uganda approaches realistic prospects of HIV epidemic control in the short run. Figure 3.14

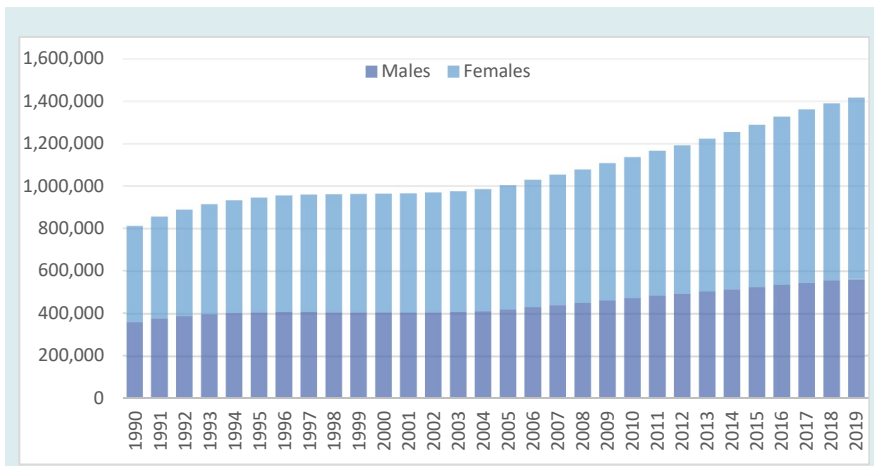


Figure 3.14: Trends in the number of PLHIV in Uganda 1990-2019 [Source: Spectrum estimates)

The trends of PLHIV varies among age group. As shown in Figure 3.15 below, while the number of PLHIV aged 15 – 24 years has declined in recent years, that among older people aged over 50 years has increased from 9.6 percent of PLHIV in 2010 to 17% in 2019. It is projected that older PLHIV aged over 50 years

will constitute 25% of all PLHIV by 2025 and 41% by 2030. For most of the past three decades, PLHIV aged 15 – 24 years exceeded that of those aged 50 years + by two fold. However, this has progressively dropped and may have reversed in the past three years with PLHIV over 50 years exceeding that among young people aged 15 – 24 years.

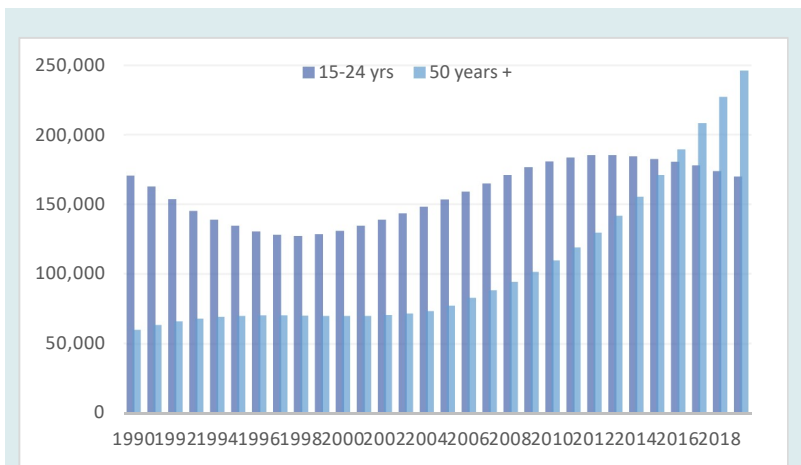


Figure 3.15: Trends in number PLHIV aged 15 – 24 years versus those aged over 50 years 1990-2019 [Source: Spectrum estimates]

The trends of children living with HIV (CLHIV) is different but also varies by age group. CLHIV have also declined especially among children under one year of age.

3.3 AIDS Related Mortality:

Due to paucity of empirical data on AIDS mortality in Uganda’s health Information and vital statistics, we used Spectrum estimates. Based on these estimates, AIDS-related mortality in Uganda also declined in recent years by 60% to approximately 21,500 AIDS-related deaths in 2019, close to the SDG target of 75%. Figure 3.16 below shows the trend in estimated AIDS related deaths during the past three decades, which again highlights that men were more disproportionate in these statistics than women in recent years.

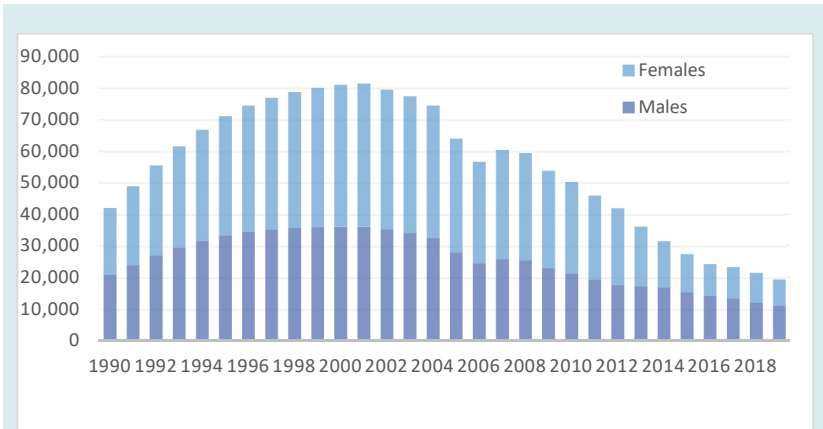


Figure 3.16: Trends in estimated AIDS-related deaths among males and females in Uganda 1990 – 2019 [Source: Spectrum estimates]

The patterns in AIDS-related mortality appear to vary by age-group. For instance, the recent declines in AIDS-related mortality is not replicated among adults aged over 50 years, and among young people 15 – 24 years as shown in Figure 3.17 below.

The estimated AIDS-related mortality rate sharply declined to 47/1000 (55/1000 among males, and 37/1000 among females) in 2019 from 166/1000 in 2010, and 364/1000 respectively in 2000. The peak age-group specific mortality may have shifted to 45 – 55 years in 2019 from 35 – 44 years in 2020.

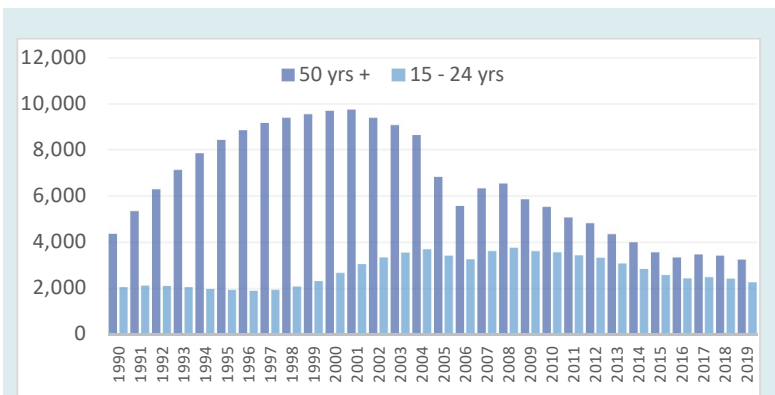


Figure 3.17: Trends in Estimated AIDS-related deaths among 15 – 24 year- and over 50 years olds [Source: Spectrum estimates]

3.4 Vertical Infections

Although Uganda has achieved significant reduction in mother-to-child transmission of HIV (MTCT), vertical infections remain high estimated at approximately 5,690 [plausibility limits: 4,420 – 8,390] in 2019. It is estimated that approximately 195,000 vertical infections were averted during the decade

by PMTCT services, with approximately 16,100 such infections averted in 2019 alone. The trajectory of the estimated annual number of vertical infections and infections averted over the past 2 decades is shown in Figure 3.18 below.

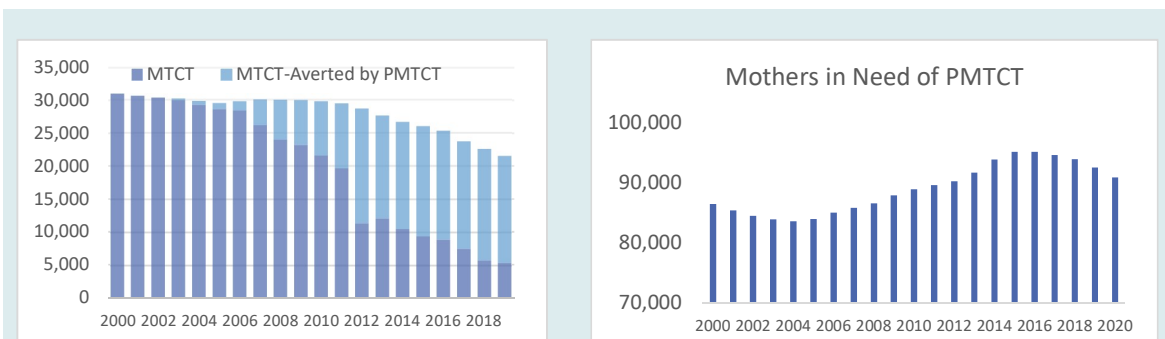


Figure 3.18: Trends in estimated annual vertical infections and vertical infections averted by PMTCT services in Uganda during the past two decades [Right] and women in need of PMTCT services [Right]

The four-pronged PMTCT strategy in Uganda that includes HIV prevention among young women appears to be decreasing the number of women in need of PMTCT, Figure 3.18.

3.4.1: MTCT Rates:

The drop in vertical HIV infections are mainly due to the falling MTCT rate during the decade largely attributable to scale up of efficacious PMTCT services based on Option B+. Although various estimates of MTCT rates abound, based on the 2019 Spectrum file, the estimated MTCT rate at six weeks of delivery and that after breast feeding for the past two decades are summarized in Figure 3.19. The MTCT rate in 2019 was 2.8% [plausibility limits: 2.3% – 4.0%] which was comparable to that obtained from the recent PMTCT impact evaluation in the country conducted in 2018-19.

The 2019 Spectrum estimated MTCT rate after breast feeding was 6.0% [plausibility limits: 4.9% – 8.7%], reflecting a drop from over 30% that prevailed prior to 2010.

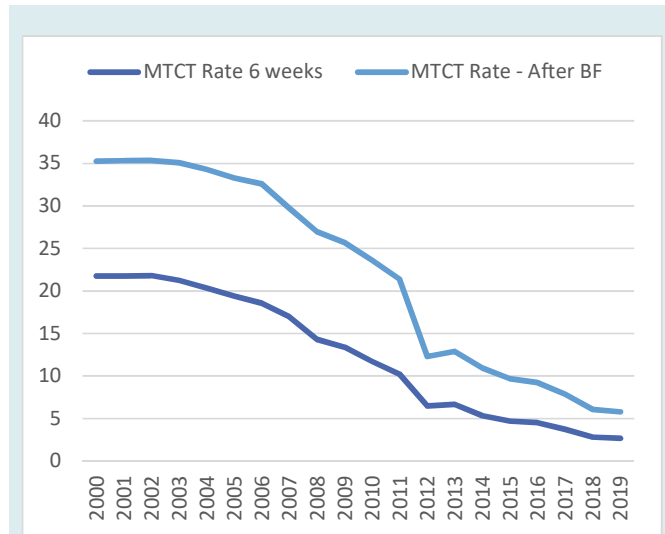


Figure 3.19: Estimated MTCT rate at 6 weeks and that after Breast Feeding in Uganda 2000 – 2019

3.4.2 Sources of Vertical Transmission:

Analysis of the causes of vertical infections revealed that approximately 47% in 2019 were acquired during pregnancy, while 53% were acquired after pregnancy. The relative distribution of the sources of the vertical infections are shown in the stacked bar charts in Figure 3.20. Based on this analysis, one quarter of vertical infections (25%) occurred during pregnancy among women who dropped off ART while still pregnant, and one-fifth (21%) among women who dropped off ART either during pregnancy or breast feeding but the babies were infected during breast feeding. This implies that women defaulting on ART accounted for nearly half (46%) of the vertical infections, highlighting an important area of focus for PMTCT services.

The high HIV incidence among women during pregnancy and postpartum presented in section 3.4 accounted for approximately one-quarter of vertical infections (24%) that occurred among women who acquired HIV during breast feeding, and a further 11% among women who acquired HIV infections during pregnancy. With over one-third (35%) of vertical infections attributable to the high maternal HIV incidence during pregnancy and post-partum, this constitutes another important priority for PMTCT services during the next decade.

Among women adhering to ART, HIV transmission to their babies appears to be low. Only a small proportion of the vertical infections may have occurred among women who started ART during pregnancy or were on ART before the pregnancy, i.e. 8% of the infections occurred during pregnancy among such women and another 8 percent during breast feeding. The remaining 4 percent of vertical infections may have occurred either during pregnancy or breast feeding among women who started ART late i.e. within 2 weeks of delivery and therefore had not yet achieved viral suppression at the time of delivery. PMTCT services need to sustain these gains during the next decade.

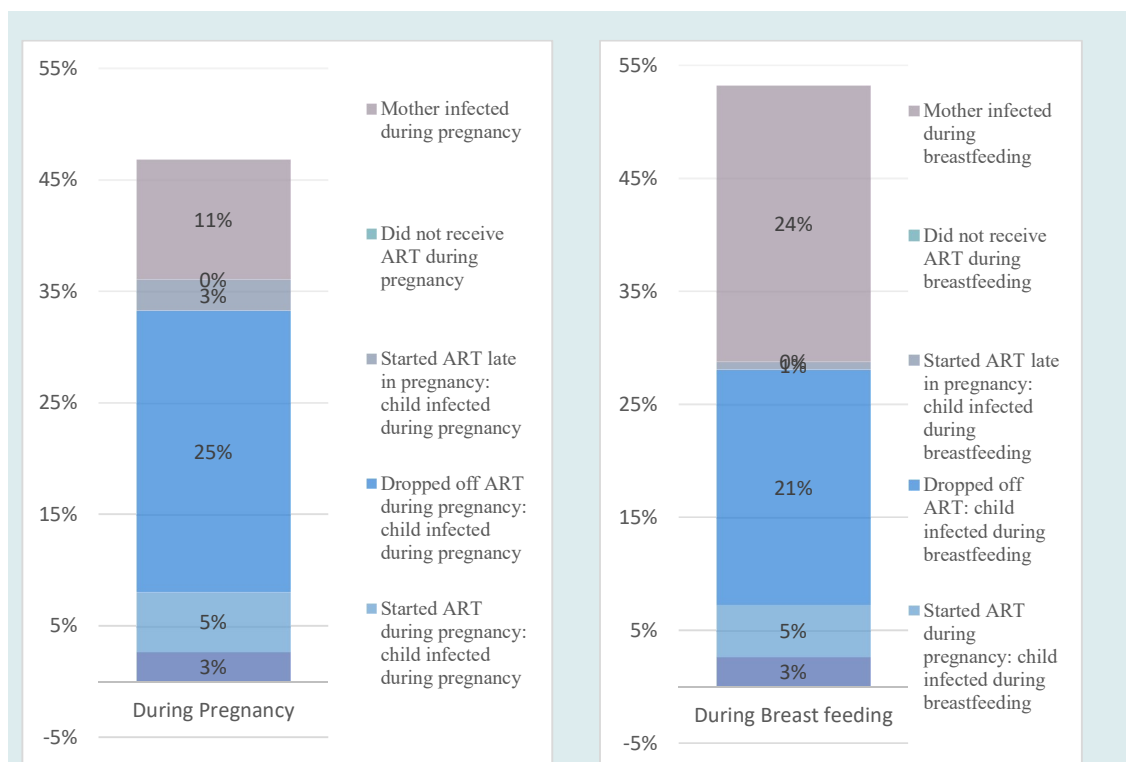


Figure 3.20: Stacked bar charts of the patterns of the sources of vertical infections in 2019 – During Pregnancy [Left]; and during breast feeding [Right]

Regional variations in the patterns of vertical infections were revealed by stacked bar analysis for previous years in the country²⁹, but we are yet to examine these patterns in this synthesis. These variations may inform regional tailored interventions for PMTCT.

These estimates may have obscured vertical infections among women who do not attend ANC and therefore don't get ARVs since the reported number of women on ART during 2019 exceeded the number of HIV-positive pregnant women. It was assumed that there were no women who were not started on ARVs and so no vertical infections occurred among such women. This may be due to data quality deficits, and a potential subject of a data quality assessment. Previous analyses revealed a high vertical transmission from this source with variations among the geographical regions of the country.

3.4.4 MTCT Rate Based on EID and Birth Cohort Monitoring

The PMTCT Impact Evaluation (IE) study conducted in 2018-19; and ii) Early Infant Diagnosis (EID) testing of exposed infants based on polymerase chain reaction (PCR) DNA testing of exposed infants' where samples from health facilities are tested at Central Public Health laboratories (CPHL) provided similar MTCT rates to those presented in section 3.4.2. The PMTCT Impact Evaluation study³⁰ was conducted in 206 facilities across the country, and determined early and late MTCT rates countrywide and in a cluster of DREAMS project districts. It enrolled 17,811 mother-infant pairs (MIP) (2,283 HIV-positive MIPs; and 15,528 HIV-negative MIPs), recruited from immunization clinics. The babies aged 6 – 12 weeks of

²⁹ Regional Spectrum Estimates for 2018 – Regional Spectrum files

³⁰ The PMTCT Impact Evaluation Study

age, and their mothers or care givers were followed up every 3 months with HIV serological testing till 18 months to assess sero-conversion of the baby and the HIV-negative mothers. The MTCT rates at baseline and follow up are summarized in Figure 3.21.

The early MTCT rate overall was 2.1% and 2.4 in DREAMS districts. This is comparable to the 6-weeks MTCT rate estimated by Spectrum.

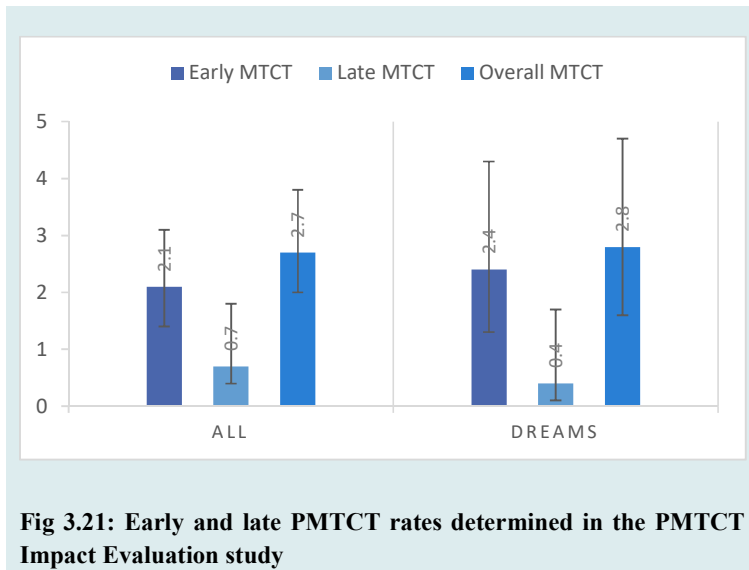


Fig 3.21: Early and late PMTCT rates determined in the PMTCT Impact Evaluation study

Over the 18 months follow up, the overall MTCT rate was 2.7%, similar to 2.8% in DREAMS project districts. The HIV incidence among the mothers were reported in section 3.4.

The MTCT rates and trends for recent years obtained from EID testing and birth cohort monitoring summarised in Table 3.4 below, are similar to the Spectrum estimates and those obtained from the PMTCT IE. Under EID testing, blood samples obtained from HIV-exposed infants in facilities are transported via the hub-based sample transportation system to CPHL where they are tested for HIV using DNA PCR, with results returned to facilities via an automated results return system. There is also increased coverage of point of care (POC) EID testing especially in far flung facilities. The results from the two sources are also available on the online EID dashboard³¹.

Table 3.4: MTCT Rates based on EID and birth cohort monitoring:

Year	EID and Rapid Testing		Birth Cohort Monitoring
	First PCR	Overall	
2016	5%	4%	7%
2017	4%	3%	6%
2018	4%	2%	5%
2019	3%	2%	3%

3.5 HIV Burden among Key and Priority Populations

Key population such as female sex workers (FSWs), men who have sex with men (MSM), people who inject drugs (PWID), other sexual minorities, and individuals in incarceration, and other priority population groups such as fisher folk, long distance truckers, etc, are an important at risk group often associated with disproportionately high HIV burden and HIV incidence. Given the prevailing sexual networking patterns, they often play a big role in maintaining HIV epidemics in the general population. The KPs and some PPs groups are often stigmatised, and

³¹ <https://edash.cphluganda.org/>

face structural barriers that limit their access to, uptake and adherence to HIV prevention and treatment services.

Uganda still has paucity of data on HIV seroprevalence and incidence among these population groups at high risk of HIV as well as their population sizes and mapping of their locations to facilitate provision of services. The few recent studies of mapping and population sizes estimates of these groups in the country used varying sampling methods and often came up with contradictory data. The 2018, Uganda AIDS Commission (UAC) consensus estimates of the population services of various KPs and PP groups based on detailed data triangulation followed by a consultative process³² are summarized in Table 3.5 below.

Table 3.5: Consensus Estimates of the Population sizes of Key and Priority Populations in Uganda
[Source: Consensus Estimates Report]

Key population	Population estimate	Lower Limit	Upper Limit
Men who have sex with men	22,663	12,692	32,635
Female sex workers	130,359	50,744	210,849
People who inject drugs	7,356	1,839	11,034
Fisher Folk	731,870	176,532	1,289,048

3.5.1 HIV Prevalence among KPs and PPs

Recent studies in Uganda, including those conducted by MRC in Kampala and Masaka; Makerere School of Public Health (MSPH) using the PLACE methodology in 25 districts; and the Crane Survey in Kampala all highlight the consistently high prevalence of HIV among female sex workers and other key and priority population groups. The MRC Good Health for Women Project (GHWP) that enrolled 4,817 female sex workers aged 15 – 49 during 2013 – 19 from slum areas of Kampala found HIV prevalence of 36%³³. The HIV Incidence among the women declined from 4.0 /100 PYs during 2013 – 14 to 2.7 /100 PYs during 2016 – 17 in part due to the HIV prevention services provided.

The Crane survey conducted during 2012 – 13 among high risk populations in Kampala enrolled through capture-recapture method reported high HIV prevalence that was several fold that of the general population of the city, Figure 3.22³⁴. Among FSWs, HIV prevalence was 31.3%, five-fold that of the general population of Kampala; while that among MSMs was two-fold i.e. 12.7%. People who inject drugs (PWID), men with multiple partners and the small number of transgender women had HIV prevalence that was three – four fold that of the general population. On the other hand, the HIV prevalence among refugees from the Democratic Republic of the Congo (6%) was comparable to that of the general population of Kampala.

In the same survey, the prevalence of syphilis among sex workers and men who have multiple partners was about two fold that of the general population. However, PWID had a particularly high prevalence of syphilis (23.5%), almost seven-fold that of the general population. The survey also highlighted how sexual networks of these high-risk groups intertwine with that of the general population presenting a high potential of bridging infections.

³² Uganda AIDS Commission: Synthesis, Consolidation and Building Consensus on Key and Priority Population Size Estimation Numbers in Uganda: Kampala, December 2019

³³ MRC: Good Health for Women Project

³⁴ MUSPH: Crane Survey Report: Bio-behavioural Surveys Among Groups at High Risk of HIV in Kampala, Uganda; October 2017

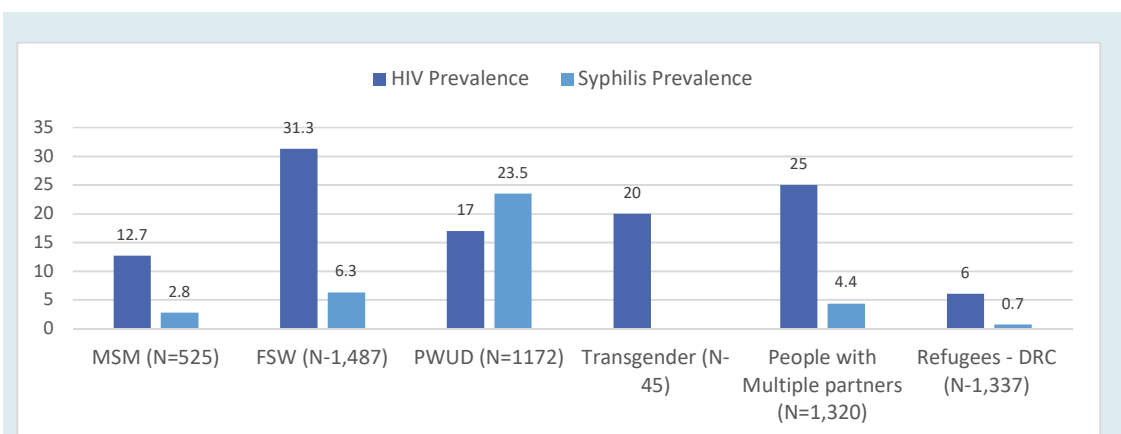


Figure 3.22. HIV and Syphilis prevalence among high risk population groups in Kampala 2012-13 [Source Crane Survey Report]

High HIV burden was also reported by the PLACE study³⁵ conducted by the Makerere University School of Public Health in 25 districts in Uganda in 2018 that involved HIV testing of over 14,000 young adults located in hotspots in urban centres. The HIV prevalence among sex workers was 14.6%, and 12.4% among females working in recreation / entertainment places, Figure 3.23. This study highlighted the high HIV prevalence among women who work in entertainment / recreation places that had hitherto remained unrecognised. Such women and men don't currently feature in HIV programmes for KPs and PPs. The prevalence of HIV among MSM (7.5%) and a small group of transgender women (12.4%) all exceed by far that among comparable groups in the general population.

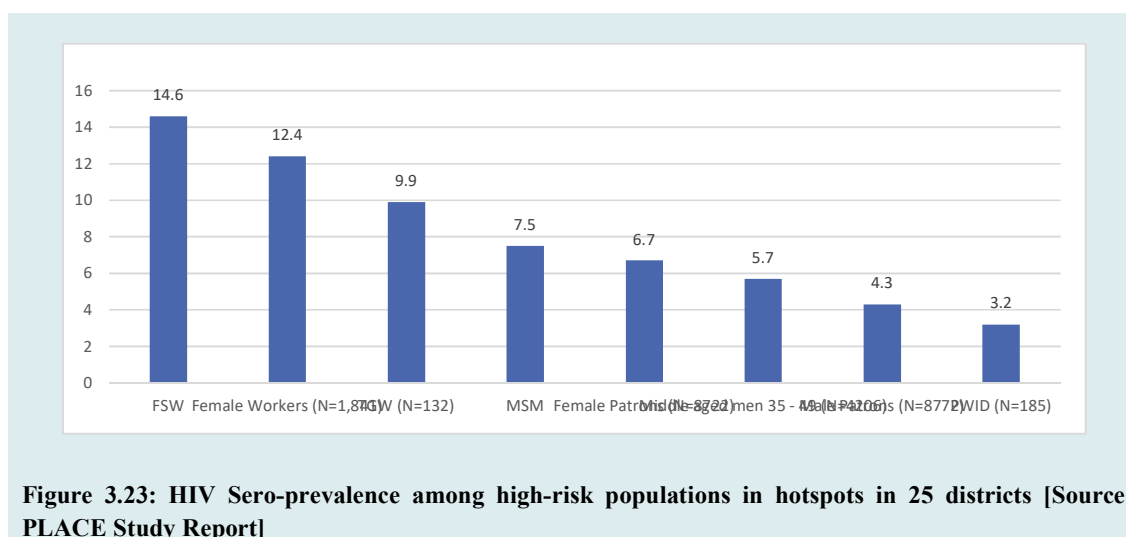


Figure 3.23: HIV Sero-prevalence among high-risk populations in hotspots in 25 districts [Source PLACE Study Report]

These studies highlight not only the high burden of HIV among these groups, but also the sex networks that link with the general populations. These should inform HIV high test yield strategies and behavioural interventions. We don't have data on knowledge of HIV status and

³⁵ MUSPH: PLACE Study Report

the HIV testing and treatment cascade for these groups that is vital to inform appropriate interventions.

3.5.2 HIV Prevalence among Prisoners

The sero-behavioural survey conducted in Uganda prisons in 2012 – 13³⁶ among prisons inmates and prisons staff comprised of mainly prisons warders highlighted the high HIV burden, Figure 3.24 below. HIV prevalence among male prisoners (14.1%) was two and half fold that of the general male population in Uganda, while that among female prisoners was over three fold (23.9%). HIV prevalence among prisons staff (14.7%) was somewhat lower than that of prisons inmates, but nearly twice that of men and women in the general population.



Figure 3.24 HIV prevalence among prisons staff and inmates (prisoners) in Uganda 2015 [Source: Uganda Prisons Service Sero-behavioural Survey Report, May 2019]

A high prevalence of other sexually transmitted infections among prisons inmates and staff was also revealed. The prevalence of Hepatitis B Virus (HBV), Herpes Simplex Virus type 2 (HSV-2) among inmates and staff is shown in Figure 3.25 below.

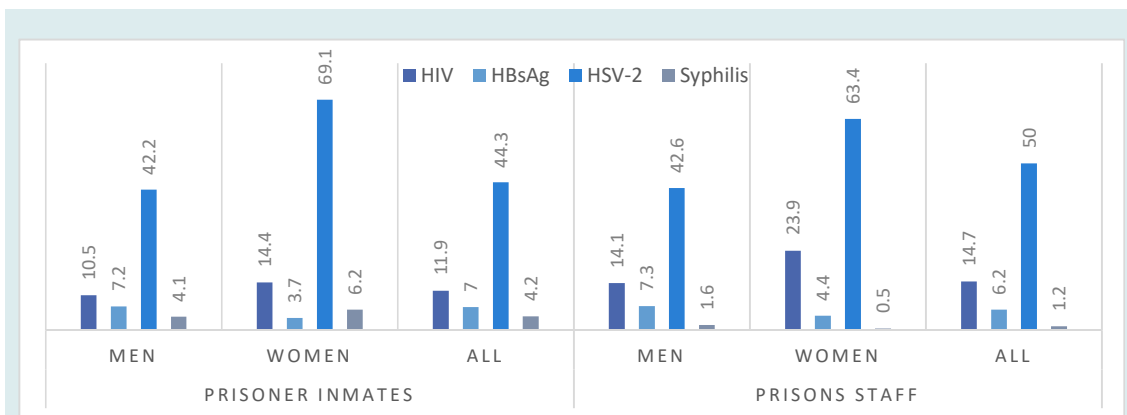


Figure 3.25: Prevalence of HIV, Syphilis, HBsAg, and HSV-2 among prisons inmates and prisons staff in the UPS Bio-behavioural Survey

³⁶ Uganda Prison’s Service: Uganda Prison’s Service Sero-behavioural survey, 2013 – 14. Kampala, May 2019

These data highlight the high HIV burden among people in incarceration and the ongoing need to provide not only regular or targeted HIV testing services and HIV treatment services, but also monitoring of the HIV cascade to determine levels of ART enrolment and VLS.

3.5.3 HIV Prevalence among Clients with Sexually Transmitted Infections

Recent HIV surveillance data among STI clients continues to highlight the epidemiological synergy between HIV and STIs that has been recognised for a long, Figure 3.26 below which shows the trends of HIV prevalence among STI clients at one urban referral clinic in Kampala. Over the years, HIV prevalence among STI clients substantially exceeded that in the general population, although it may have dropped in recent years. This highlights the need for regular testing of STI clients and the potential for high HIV test yield, as well as need for monitoring of all elements of the HIV testing and treatment cascade among them. HIV incidence data for KPs and PPs were summarised earlier in this section 3.

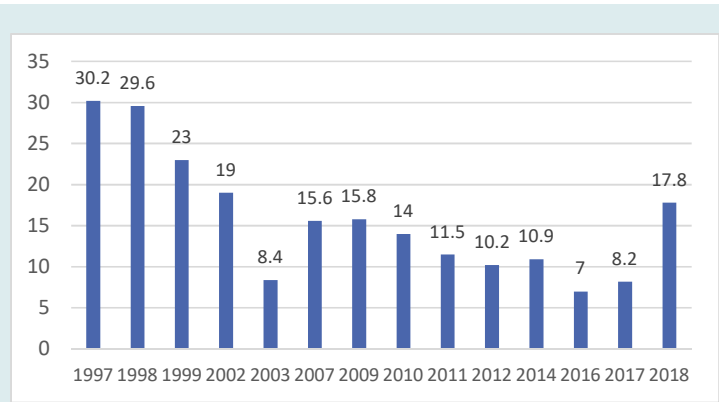


Fig 3.26: Trends in HIV Prevalence 1997 – 2018 among STI clients at the Mulago Hospital STD Clinic

3.6 Behavioural Factors Driving the HIV Epidemic

Uganda’s HIV epidemic is to a large extent driven by sexual behaviour including multiple concurrent partners, casual sex, low levels of condom use during risky sex, and early sexual debut among young people. Sexual behaviour patterns and trends provide early warning on HIV incidence. Sexual behavioural patterns of adults are tracked through population-based surveys. Based on data from previous surveys, most behavioural indicators have not changed much during the past decade.

3.6.1 Sex with non-marital non-cohabiting or casual partners

Sex with non-marital or non-cohabiting partners also referred to as casual sex partners was previously shown to be associated with HIV incidence. The practice remains common among men and women, and has not changed much over the past decade as shown in Figure 3.27 where the proportion of sexually active men and women aged 14 – 49 years who reported this behaviour in the preceding 12 months in the three national population-based surveys conducted in Uganda in 2004/05, 2011 and 2016/17.

Men who reported sex with non-marital non-cohabiting partners appears to have increased from approximately one-third of men in 2005 – 2011 to nearly half of men in the population in 2016/17. Among women, this proportion doubled from about 15 percent to 30% over the same period. Casual sex was more likely to be reported by urban residents, young people and people in the higher wealth quintiles in the 2016/17 survey. Given the high levels of viraemia in the population, the trends in casual sex should be a cause for concern and a key focus of behavioural interventions.

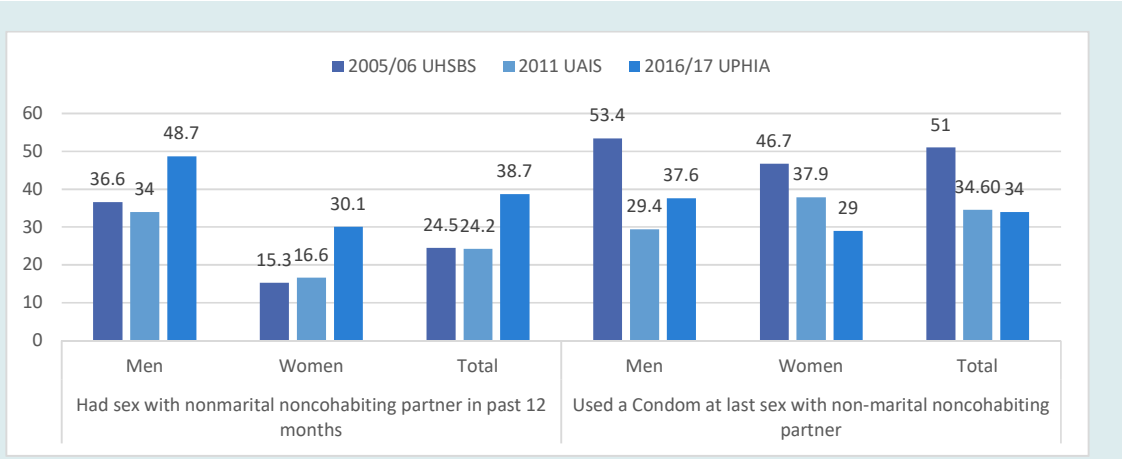


Figure 3.27: Trends in proportion of men and women aged 15 – 49 years that reported sex with a nonmarital non cohabiting partner in the preceding 12 month (Left); and among them, the proportion that used a condom the last time they had sex with such a partner

3.6.2: Condom use with casual partners

While sex with casual partners is high risk behaviour for HIV transmission, consistent condom use during such encounters may be protective. However, data from the three population surveys show that consistent condom use during casual sex remains low and may be declining in recent years. In 2004/05 while

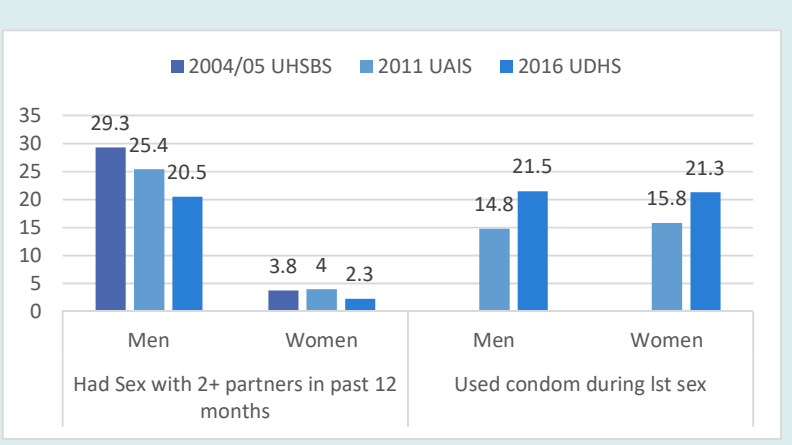


Figure 3.28: The proportion of adults aged 15 – 49 years that reported having sex with 2+ partners in the preceding 12 months and the proportion that used a condom at last sex in three national surveys:

at least half (51%) of such casual sex involved use of a condom at least at the last sex encounter, this had fallen to about one-third (34%) in 2016/17. Men were slightly more likely to report condom use during these encounters than women (38% versus 29%) in 2016/17, Figure 3.27 above. Among women, there appears to have been a steady decline in condom use during such encounters from 47% in 2004/05 to 29% in 2016/17. Urban residents, young people and people in the higher wealth quintile were more likely to report condom use during casual sex in 2016/17. The low levels of condom use in high risk sex should also be an important focus area for behavioural interventions in the next phase of the HIV response.

3.6.3: Multiple Sexual Partnerships and Condom Use in Such Relationships:

Having multiple partners (including concurrent partners) is also associated with high risk of sexual transmission of HIV. About one in five sexually active men reported having had sex with more than one partner in the past twelve months in 2016 UDHS, Figure 3.28. Only 2 percent of women reported this sexual behaviour. The proportion of men reporting multiple

partnership declined slightly from 29% in 2004/05 and 25% in 2011. For women, taking the small numbers into account, the proportion remained 2 - 4% during the same period. Having multiple sex partners varied across the geographical regions of the country. There also appears to be correlation between multiple partnerships and regional level HIV prevalence in Uganda.

Condom use in the context of multiple partnerships remained suboptimal; in the 2011 and 2016 surveys, the proportion men and women who used a condom they last time they had sex in the context of multiple partnership, were one-in five such men and women. The high levels of multiple sex partnerships amid low levels of condom use should constitute an important areas of focus for behavioural interventions during the next decade.

3.6.4 Early Sexual Debut among Adolescents and Young People

Initiation of sex before turning age fifteen is considered high risk for HIV. The proportion of young people who reported initiating sex before turning age 15 in the three previous HIV surveys is shown in Figure 3.29.

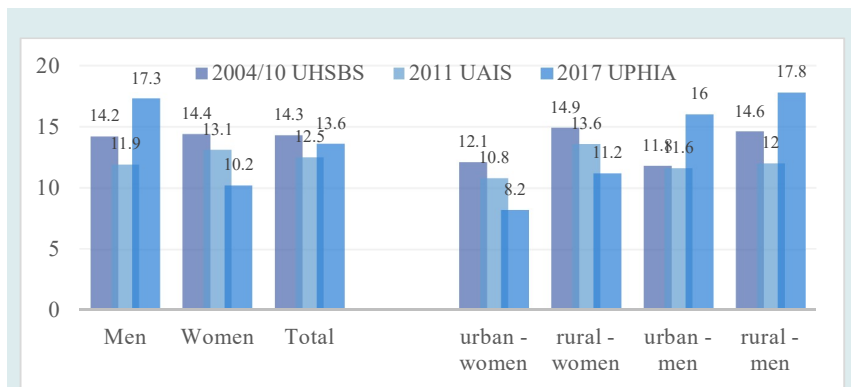


Figure 3.29: Proportion of Young People 15 – 24 years who had sex before turning 15 as reported in 2004/05 UHSBS, 2011 UAIS and 2016/17 UPHIA

In the 2016/17 UPHIA, 13.6 percent of young people aged 15 – 24 years

reported having first sex before turning 15 years of age. Young men were more likely than young women to report early sexual debut (17.3% versus 10.2%).

Overall, the proportion of young people initiating sex before they turn 15 has not changed much during the past 15 years, though it appears young women may be delaying their first sexual debut, with the proportion initiating sex before turning 15 dropping from 14.4% in 2004/05 to 10% in 2016/17. This appears to be the case among young girls and young women residing in urban and those in rural areas. However, there appears to be no obvious trend among young men. Unadjusted HIV sero prevalence data appears to show that young women who delayed sexual debut in 2016/17 UPHIA were less likely to be HIV-infected than their counterparts who started sex earlier, Figure 3.30.

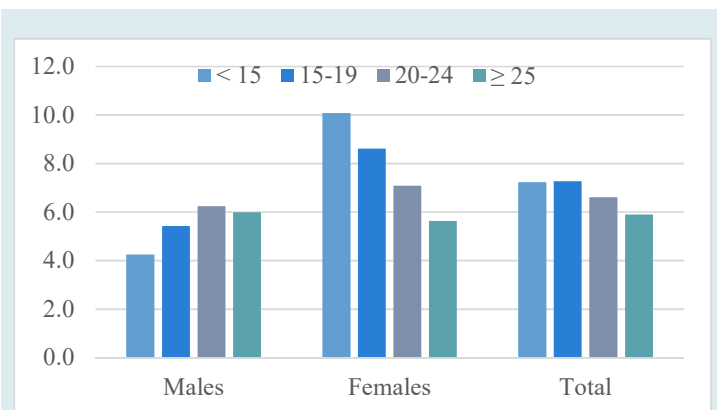


Figure 3.30: HIV Prevalence by age of sexual debut among young men and women in the 2016/17 UPHIA

likely to be HIV-infected than their counterparts who started sex earlier, Figure 3.30.

3.7 Viral Load Suppression and HIV Testing and Treatment Cascade

In Uganda and other countries in the region, there has been unprecedented increased coverage of HIV diagnosis, linkage and adherence to antiretroviral therapy, and viral load suppression. Strong adherence to antiretroviral therapy suppresses viral load to undetectable levels within people living with HIV, greatly reducing the risk of HIV transmission. As part of the triple 90 targets, the third 90 aims for at least 90% of people on treatment having suppressed viraemia, defined as less than 1,000 viral copies per millilitre of plasma.

3.7.1: Viral Load Suppression among PLHIV on ART

In Uganda VL monitoring of HIV treatment has progressively increased since 2015. Data on VLS is available online VLS dashboard³⁷. Adults and children on ART are expected to have at least one VL test annually. The coverage of VLS in Uganda among PLHIV on ART at the end of 2019 is shown in Table 3.6. Under this testing programme, blood plasma and dried blood spots (DBS) samples are relayed through the sample transportation system from treatment clinics and transport hubs to CPHL where centralised VL testing is conducted.

Table 3.6: The Coverage of Viral Load Tests and VLS among ART Clients Tested in 2019.

	No. PLHIV	No. PLHIV on ART	No. PLHIV Tested for VL	Coverage VL testing among PLHIV on ART	No. with VLS	% of tested VLS
Children 0 - 14 years	102,296	66,203	71,416	108%	52,710	73.8%
Men 15 years +	527,540	403,715	366,904	91%	326,695	89.0%
Women 15 years +	831,534	753,595	707,022	94%	649,060	91.8%
Total Adults 15 years +	1,359,074	1,157,310	1,073,926	93%	975,755	90.9%
Total Adults and Children	1,461,370	1,223,513	1,145,342	94%	1,028,465	89.8%

In 2019, 93% of adults on ART in Uganda had VL tests conducted, approximately 91% of adults tested had achieved VLS. Among adult clients, VLS was marginally higher among adult women compared to adult men (92% versus 89%). However, over three quarters (26.2%) of children 0-14 years on antiretroviral treatment in Uganda had not achieved VLS.

3.7.2: Population Level Viral Load Suppression

When the ascertained VLS is to against all PLHIV, VLS falls to 77% among adults and 48% among children. Based on this, adults had already met the targets for the third 90 under the conditional cascade (target 73%), but not the targets for the third 95 (target 85%).

Table 3.7: The Coverage of ART and VLS among all PLHIV in 2019.

	No. PLHIV	No. PLHIV on ART	% PLHIV on ART	No VL tested	% of tested VLS	VLS among all PLHIV
Children 0 - 14 years	102,296	66,203	68%	71,416	73.8%	48%
Men 15 years +	527,540	403,715	79%	366,904	89.0%	68%
Women 15 years +	831,534	753,595	94%	707,022	91.8%	83%
Total Adults 15 years +	1,359,074	1,157,310	88%	1,073,926	90.9%	77%
Total Adults and Children	1,461,370	1,223,513	86%	1,145,342	89.8%	75%

³⁷ Viral Load dashboard accessed at <https://vldash.cphluganda.org/> accessed on 23rd March 2020

Children were still lagging far behind, and had not yet met that target for the third 90 and were unlikely to do so by 2020. Among adults, women at 83% percent had exceeded the target for the third 90 but still fall just short of the third 95. At 68%, adult men were still falling short of the targets.

3.7.3 Trends in Viral Load Suppression.

Population level VLS has increased steadily since 2015 among all age groups and gender, Figure 3.31. Among adult women, VLS may have surpassed the 2020 targets for the third 90 having increased from under 60% four years ago to about 83% in 2019. However, adult men fell short of the 2020 target, with VLS increasing from 46% in 2016 to 68% in 2019. Among children, the increase is more dismal; from 36% in 2016 to 48% in 2019.

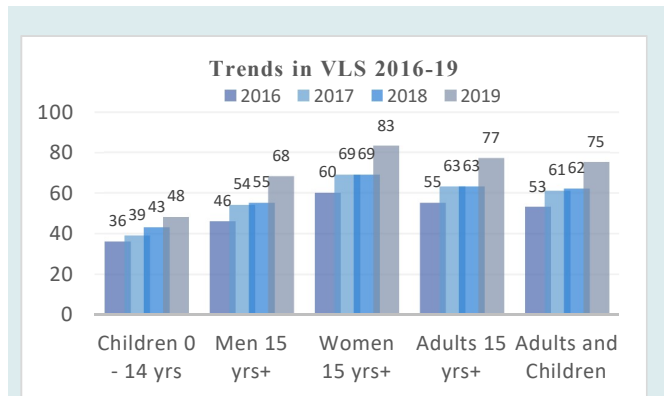


Figure 3.31: Trends in VLS among men and women aged 15 years+ and Children aged 0-14 years during 2015 – 19

3.7.4 Status of Entire HIV Testing and Treatment Cascade:

Based on data from Spectrum (PLHIV), the Shiny 90s model in Spectrum (first 90), and the routine health information reporting system for the second and third 90s. Uganda has made tremendous progress on all elements of the cascade for adults and children, Figure 3.32. Ideally, the cascade is best determined from representative population-based surveys, but they cannot be conducted annually.

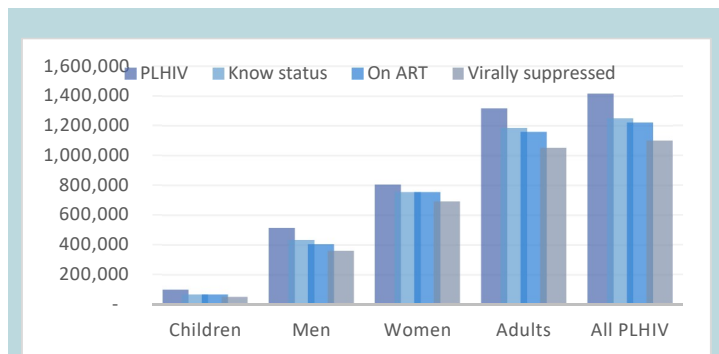


Figure 3.32: The HIV testing and treatment cascade for children, adult men and women in Uganda by end of 2019 - Cascade reflecting actual numbers [Source: Spectrum File]

To better reflect the cascade by percentages, the same cascade above if shown as non-conditional cascade and conditional cascades separately for children aged 0-14 years, adult men, adult women, and all adults and children. Figure 3.33

The conditional cascade highlights that among children at 68%, and adult men at 84%, they fall below the target for the first 90. At 94%, women would have already exceeded the target for the first 90. Attainment of the second 90 may be affected by data quality issues on tracking and reporting of linkage to care. However, the data shows that at 94%, it is only men that appear to have deficits with linkage. Among PLHIV on treatment, the third 90 reveals sub-optimal VLS especially among children with one-quarter not achieving suppressed vireamia. Men also have sub-optimal VLS with 11% of men on ART not achieving suppressed vireamia.

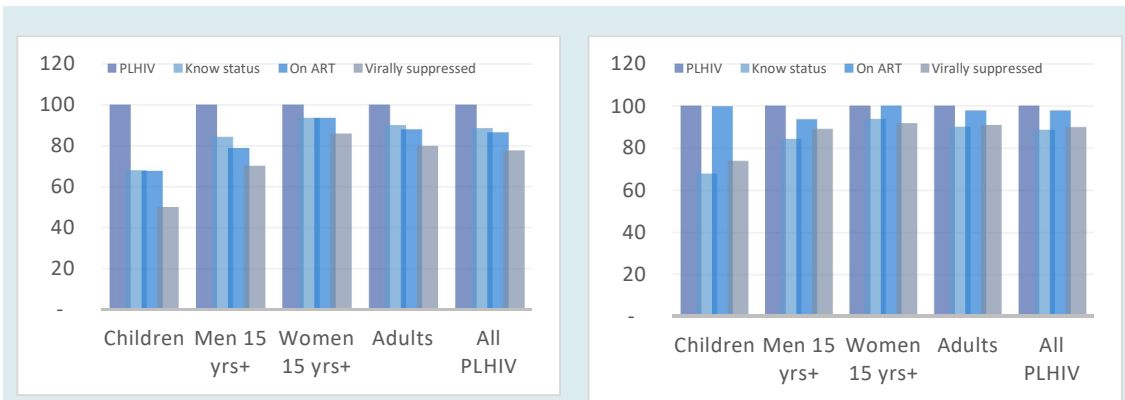


Figure 3.33: The HIV Testing and Treatment cascade among children and adult men and women at the end of 2019 as non-conditional cascade [Left] and Conditional Cascade [Right]

On the other hand, among individuals who know their status, linkage to treatment is good even among children, although at 94%, linkage among men is not optimal. Therefore, only two-thirds of HIV-infected children and 79% of HIV-infected adult men are on treatment. Viral suppression was sub-optimal among children with approximately one-half not achieving VLS as already seen in the preceding sections. Based on these data, more focused and tailored approaches will be required for adult men and children to bridge gaps in the cascade

3.7.5 Trends in the HIV Testing and Treatment Cascade:

The trends 2015 – 20 in the triple 90s cascade for children and adults is shown in Figure 3.34

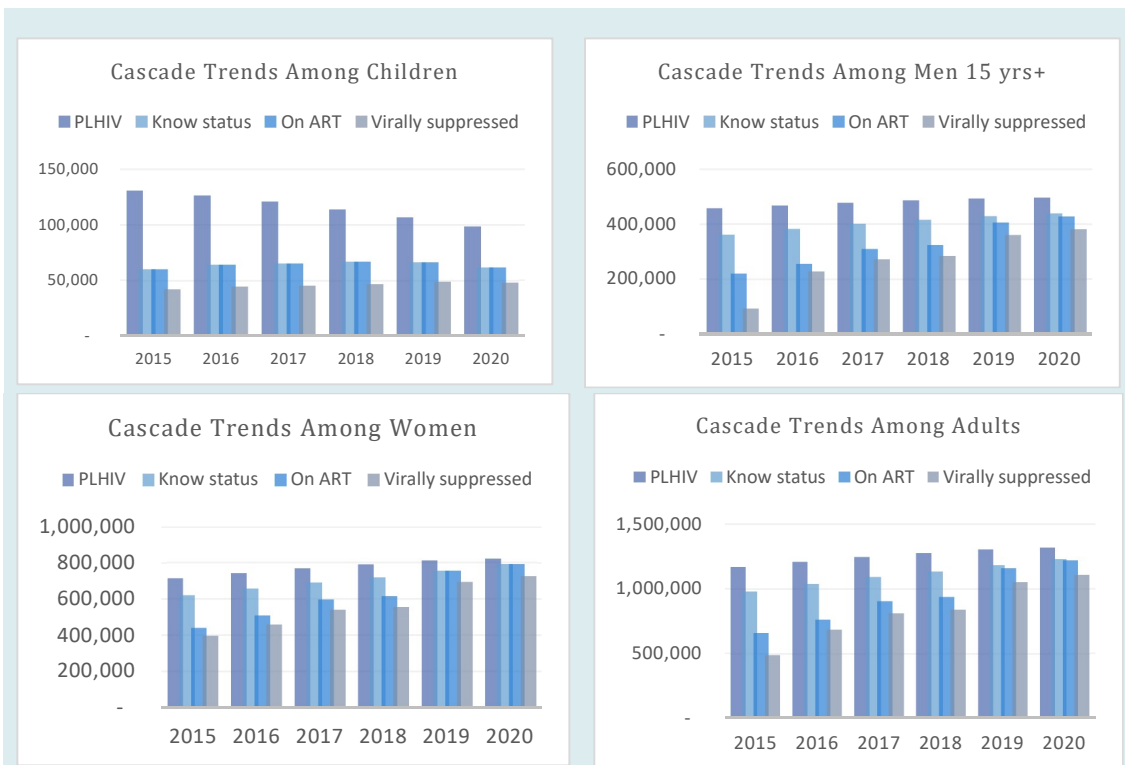


Figure 3.34: Trends in the Conditional HIV Testing and Treatment Cascades among Children, Men, Women and All Adults 2015 – 20 [Source; Spectrum File]

3.7.6 Age Group Specific Cascades:

The age group and sex-specific HIV testing and treatment cascade for Uganda in 2019 is summarised in the PLHIV population pyramids in Figure 3.35 below. This figure highlights the significant deficits in knowledge of HIV status, ART enrolment and VLS for adult men and children when compared to adult women. This again highlights that more focussed and tailored efforts are required for men and children in order for them not to be left behind.

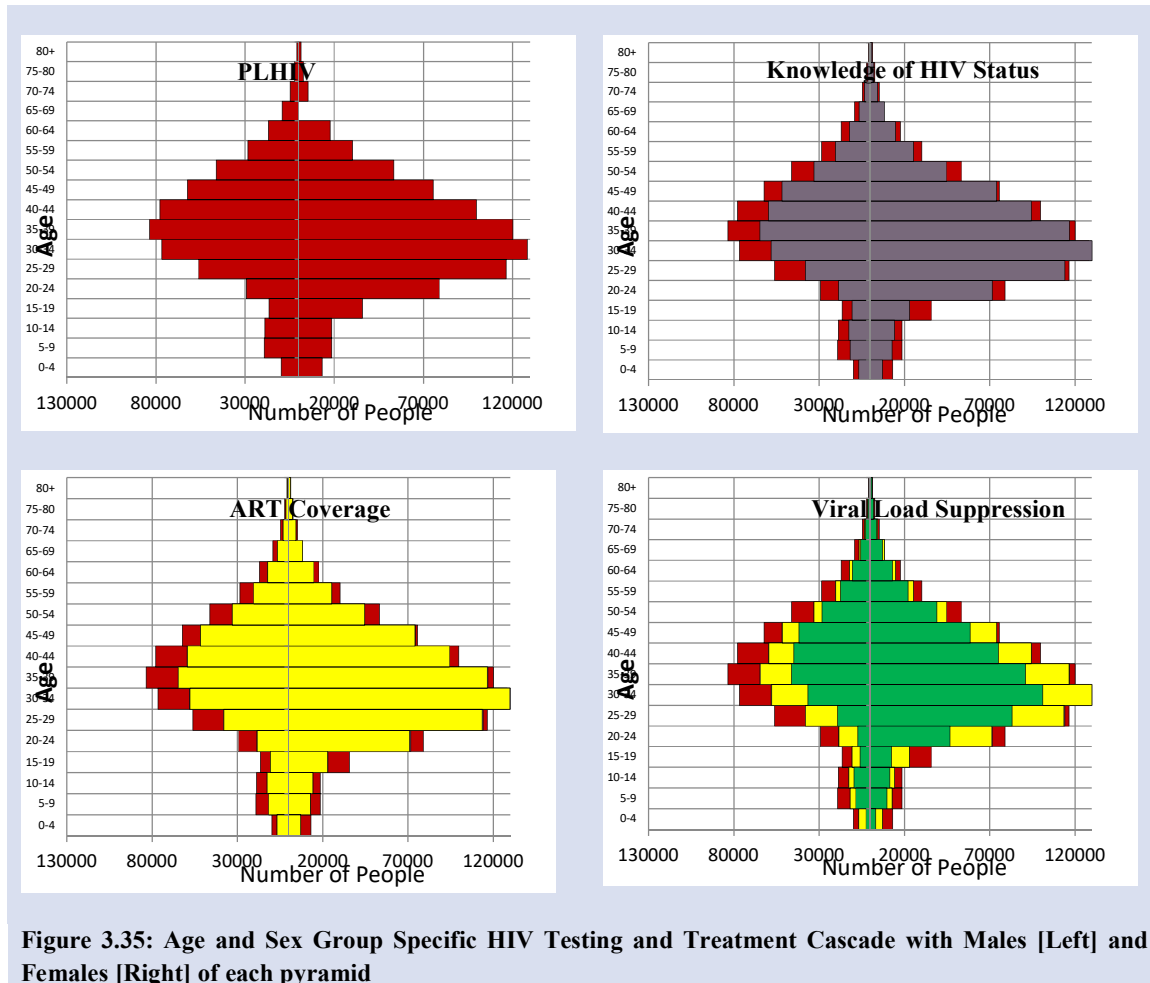


Figure 3.35: Age and Sex Group Specific HIV Testing and Treatment Cascade with Males [Left] and Females [Right] of each pyramid

3.8 Advanced HIV Disease, Co-morbidities and Antiretroviral Drug Resistance

Uganda’s HIV treatment services are now mature and showing the inevitable consequences of a long-standing antiretroviral treatment programme such as emergence of antiretroviral drug resistance (HIVDR), comorbidities, advanced HIV disease (AHD), etc. Data on various aspects of HIVDR from early warning indicators (EWIs), transmitted and acquired genotypic HIVDR based on standard protocols in line with the WHO HIVDR strategy³⁸, advanced HIV disease and comorbidities through the Health Information system all point to this problem. These data has informed strategies for optimized first- and second-line ARV regimen selection and for management of advanced HIV disease and comorbidities.

3.8.1 Transmitted Antiretroviral Drug Resistance Patterns:

³⁸ WHO: HIV Drug resistance Surveillance guidance – 201 Technical Update, WHO Geneva Switzerland, December 2015

The pattern of transmitted HIVDR resistance mutations found in the 2016/17 UPHIA survey among HIV-positive samples with recent HIV infections based on the VL/ARV/LAg assay that were genotyped to detect HIVDR mutations is summarized in Table 3.8. Among the 36 (81%) successfully amplified samples, three (8.3%) had genotypic resistance mutations to ARVs. Three samples had mutations associated with resistance to non-nucleoside reverse transcriptase inhibitors (NNRTIs) only, one had mutations associated with resistance to both nucleoside reverse transcriptase inhibitors (NRTIs), and NNRTIs, and one had mutations associated with resistance to NRTI only. None of the sample had resistance mutations to protease inhibitors (PIs), or all three ARV classes. These HIVDR patterns partly influenced the change from NNRTIs and NRTIs-based first-line regimens to Dolutegravir (DTG)-based ARVs combination as the preferred first-line regimen for Uganda³⁹.

Table 9.1 Patterns of Transmitted antiretroviral Drug Resistance among recently HIV-infected Adults Aged 15 – 64 Years in the 2016/17 UPHIA

Antiretroviral Drug Class	Number	Percent	DR Mutations Detected ¹
Successfully amplified	36	80.8	
Any	3	8.3	G190A, K103N, T215S
NRTI	1	2.8	T215S
NNRTI	3	8.3	G190A, K103N
PI	0	0.0	
NRTI & NNRTI	1	2.8	G190A, T215S
NRTI, NNRTI & PI	0	0.0	

¹Based on *Stanford Database for HIV Drug Resistance Mutation*

<https://hivdb.stanford.edu/assets/media/resistance-mutation-handout-Feb2017.516ace6f.pdf>

3.8.2 HIVDR Early Warning Indicators:

The most recent survey of HIV treatment programme practices that pose risk for emergence of HIVDR i.e. early warning indicators (EWIs) that were collected in line with WHO guidance, in a nationally representative sample of 304 ART service outlets in Uganda during October

Table 3.9: Status of HIVDR Early Warning Indicators in Facilities:

HIVDR Early Warning Indicator	Performance Target	Percent facilities meeting Target
On-time ARV pill pick-up: Percentage of patients that pick-up ART no more than two days late at the first pick-up after the baseline pick-up	Excellent >90%	9.5% (29)
	Fair 80–90%	16.5% (50)
	Poor <80.	74% (225)
Patient retention on ART: Percentage of patients known to be alive and on treatment 12 months after initiation of ART	Excellent >85%	24.2% (73)
	Fair 75–85%	22.8% (69)
	Poor <75%	53.1% (161)
Pharmacy Stock Outs: Percentage of months with no day(s) of stock-out of any routinely dispensed ARV drugs	Excellent 0%	33.6% (102)
	Poor > 0%	66.4% (202)
ARV drug dispensing practices: Percentage of patients prescribed or picking up mono or dual ARV therapy	Excellent 0%	100% (304)
	Poor > 0%.	0% (0)
Viral load suppression: Percentage of patients receiving ART at the site after the first 12 months of ART whose VL is <1,000 copies/ml	Excellent >90%	49.2% (146)
	Fair 80–90%	36.3% (108)
	Poor <80%.	14.5% (43)
Viral Load Completion: Percentage of patients with a 12-month VL test result available	Excellent >70%	50.8% (151)
	Poor <70%.	49.2% (146)

³⁹ MoH: Revised Consolidated Guidelines for HIV Treatment in Uganda,

2017 – March 2018⁴⁰ showed a high potential for emergence of HIVDR in Uganda’s HIV treatment programme, Table 3.9, while the aggregate performance for all facilities is summarized in Figure 3.36. Each indicator has a pre-set threshold target against which, the risk of HIVDR is based and six indicators were assessed.

For the six indicators assessed in the most recent survey, *On-time pill pick-up* target of 90% of patients was met by 9.5% of facilities, with facilities in the north more likely to meet this target ($p = 0.040$). *Retention on ART at 12 months* target of at least 85% of the patients was met in one quarter of facilities (24.1%), with facilities in Kampala region ($p < 0.001$), and specialized ART clinics ($p = 0.01$), more likely to meet the target for this indicator. For *Pharmacy stock-outs* - there were no ART stock outs in one-third of facilities (33.6%), with more facilities in

Kampala ($p < 0.001$), specialized ART clinics ($p < 0.001$), and private-for-profit ($p < 0.001$) meeting this target. For *Dispensing practices* - the target of 100% of clients being prescribed triple ARVs combination was met by all (100%) of the facilities. For *VLS*, the target of at least 90% of clients on ART after 12 months having achieved VLS was met by just under half (49.2%) of these facilities; For *Viral Load Completion*: The target of at least 70% having a VL test at 12 months of ART was met by half (50.8%) of facilities, facilities in central region performing better ($p < 0.001$).

Only one (0.3%) facility (i.e. Mbarara Regional Referral Hospital) met all the targets for the six EWIs. Eleven facilities (3.6%) met targets for five EWIs; 53 facilities (17.4%) met the targets for four EWIs; 97 facilities (31.9%) met targets for three EWIs; 107 facilities (35.2%) met targets for 2 EWIs; and 35 facilities (11.5%) met the targets for only one EWI. The regional variations and other facility characteristics should inform the focus of interventions to redress these risks. These findings make a compelling case for HIV treatment centres to address these programme weaknesses to avoid emergence of HIVDR that could potentially lead to switching to more expensive ARV combinations in the future.

Aggregation of all patients across facilities to determine national performance against the targets for the six EWIs, highlighted weaknesses in ART programme practices that risk emergence of HIVDR with the targets for only one indicator met, Figure 3.36. For *On-time pill pick-up* of ARVs among all patients was 63.3% (CI: 58.9–67.8) against the optimal target of 90%. *Retention on ART at 12 months* among all patients was 69.9% (CI: 63.8–76.0) against the target for this indicator of >85%. *Dispensing practices* for all clients were met for all (100%) of the clients, but *Viral Load Suppression* was 85.2% (CI: 81.8–88.5), falling short of the target of 90%. Furthermore,

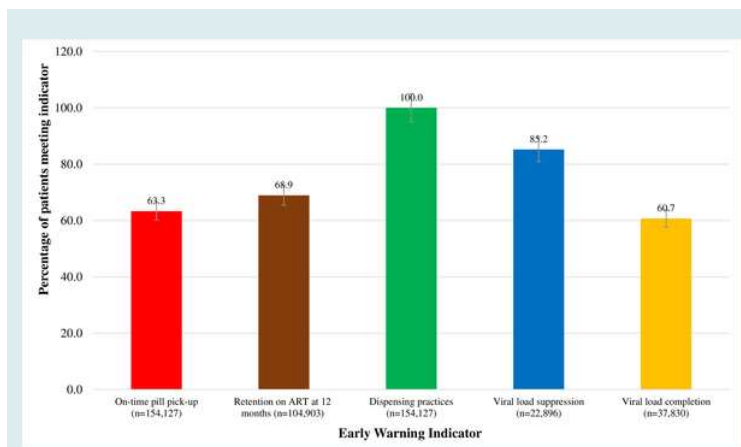


Figure 3.36 National aggregate performance against the Six HIVDR Early Warning Indicators

⁴⁰ Asio J, Watera C, Namuwenge N, Kirungi W, Musinguzi J, Mugagga K, et al. (2020) Population-based monitoring of HIV drug resistance early warning indicators in Uganda: A nationally representative survey following revised WHO recommendations. PLoS ONE 15(4): e0230451. <https://doi.org/10.1371/journal.pone.0230451>

Viral Load completion for all clients in all facilities during the reference period was 60.7% (CI: 56.9–64.6), falling short of the target of >70%. These findings highlight programme weaknesses that should be addressed by the treatment programme and facilities as part of their continuous quality improvement (CQI) during the next phase of the response.

3.8.3: Antiretroviral Drug Resistance among individuals on HIV treatment

A recent cross-sectional survey in among adults receiving first-line ART in 23 clinics (for 12 months of ART), and 43 clinics (for 48 months of ART) in Uganda⁴¹, highlighted the patterns of VLS and HIVDR, Table 3.10. This shows weaknesses in ART programme quality and informs optimisation of first and second-line ART regimens. Suboptimal VLS and detection of HIVDR in populations receiving ART may reflect gaps in ART programme quality, including

Outcome	12 months Treatment Cohort		48 months Treatment Cohort	
	Percent	No	Percent	No
<i>Viral Load Suppression</i>				
All	95.0%	493/533	87.9%	926/1,064
Males	97.7%	169/182	87.5%	319/369
Females	93.6%	324/351	88.2%	607/695
<i>HIVDR Mutations</i>				
Any	4.7%	28/533	7.6%	88/1,064
NRTI	4.4%	23/533	7.3%	84/1,064
NNRTI	4.6%	26/533	7.4%	86/1,064
NNRTI+NRTI	4.4%	22/533	7.0%	81/1,064
PI	0.1%	1/533	-	-
<i>HIVDR among VF</i>				
Any	96.1%	28/30	90.4%	88/95
NRTI	90.3%	23/30	86.8%	84/95
NNRTI	94.1%	26/30	87.6%	86/95
NNRTI+NRTI	89.5%	22/30	81.9%	82/95
PI	1.1%	1/30	-	-

inadequate adherence assessment, interruptions in drug supply and low retention in care.

Viral load suppression in both groups was high; 95.0% (CI: 93.4% – 96.5%) of the 533 patients in the 12 month group, and 87.9% (CI: 85.0% - 90,9%) of the 1,064 patients in the 48 month group had achieved VLS. However, among virological failures (VFs), the prevalence of acquired HIVDR was high. For instance among the 30 successfully amplified VF samples in the 12 months of ART group, 96.1% (CI: 72.9%-99.6%) or 4.7% (CI 3.3% – 6.1%) among all clients on treatment had HIVDR mutations. Among them, 28 had at least one HIVDR mutation: one had a mutation for protease inhibitors (PIs), 23 NRTI mutations, 26 had NNRTI mutations, and 22 had both NNRTI and NRTI mutations. None had mutations to all three drug classes.

Among the 95 successfully amplified VF samples in the 48 months of ART group, 90.4% (CI: 73.6% - 96.8%), or 7.6% (CI 5.4% - 9.5%) had HIVDR mutations. Out of these samples, 88 had at least one HIVDR mutation; 84 had NRTI mutations, 86 had NNRTI mutations, 82 had both NRTI and NNRTI, while none had PI mutations. These findings were used to update ARV regimens, but should also inform strategies for switching clients with virological failure.

⁴¹ Ssemwanga D, Asio J, Watera C, Nannyonjo M, Nassolo F, Lunkuse S, Salazar-Gonzalez J, Salazar M, Sanyu G, Lutalo T, Kabuga U, Ssewanyana I, Namatovu F, Namayanja G, Namale A, ERaizes A, Kagwa M, Namuwenge N, Kirungi W, Edward Mbidde E, Kaleebu P, Prevalence of viral load suppression, predictors of virological failure and patterns of HIV drug resistance after 12 and 48 months on first-line antiretroviral therapy: a national cross-sectional survey in Uganda : *Journal of Antimicrobial Chemotherapy*, <https://doi.org/10.1093/jac/dkz561> 05 February 2020

3.8.4: Advanced HIV Disease and Comorbidities:

In Uganda’s HIV treatment programme, advanced HIV disease (AHD) is still prevalent among both newly diagnosed individuals and those returning late to treatment after previously

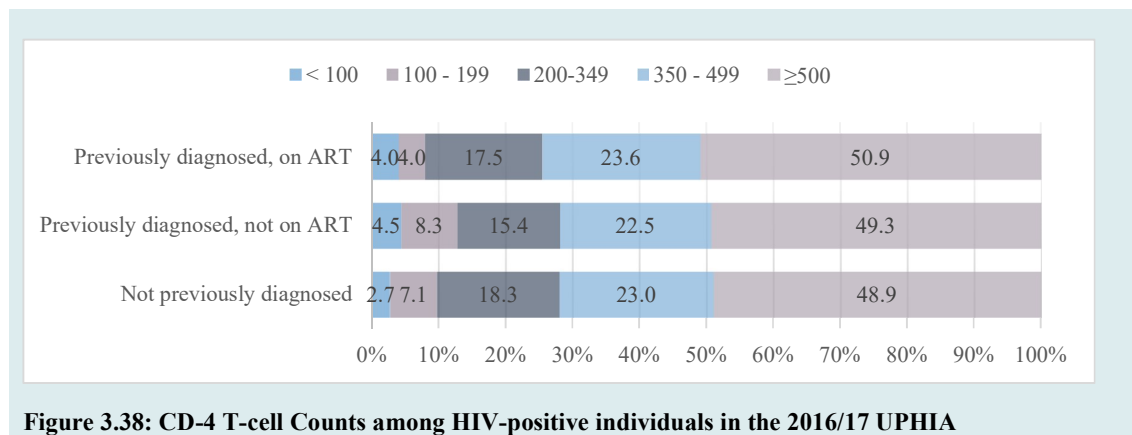


Figure 3.38: CD-4 T-cell Counts among HIV-positive individuals in the 2016/17 UPHIA

disengaging from HIV care. Individuals with advanced HIV disease present with low CD-4 T-cell counts, defined as CD-4 T-cells < 200 /ul). While the magnitude of AHD is not currently well known, 2016/17 UPHIA determined it for the first time at population in Uganda. In the survey, CD-4 T-cell enumeration was based on point of care (POC) tests, Figure 3.37 and 3.38.

Based on this survey, approximately 9% of adults were severely immunosuppressed with AHD, with men (11.2%) more likely than women (7.7%) to have advanced HIV disease, but there was no significant urban-rural disparities. Among individuals previously diagnosed and on ART, 8% had AHD and therefore in need of close monitoring. However, a higher proportion (12.8%) had been previously diagnosed and not on ART. The proportion among those not previously diagnosed was 9.8%. Among all adults living with HIV, 3.6% had very severe immunosuppression (CD4 counts less than 100 cells/μL): 2.9% of women and 5.0 % of men. This includes adults aware of their status and on treatment.

In addition, among adults, over one-third (36.6%) of HIV-positive men and one-fifth (21%) of

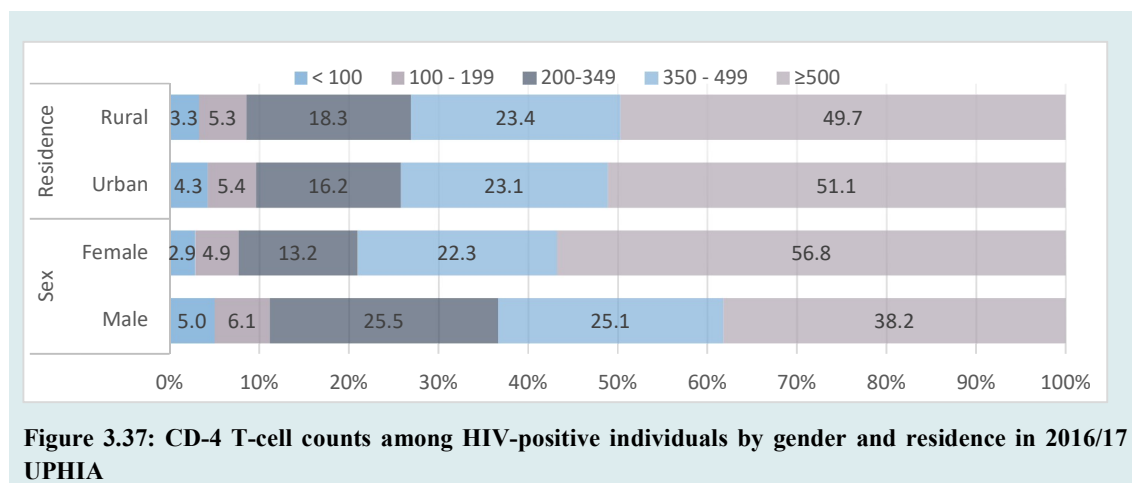


Figure 3.37: CD-4 T-cell counts among HIV-positive individuals by gender and residence in 2016/17 UPHIA

HIV-positive women had CD-4 T-cell counts less than 350 cells/ul. This may have changed since, especially after adoption of the HIV test and treat policy rolled out in 2017. This magnitude of AHD justifies the emphasis on this aspect in recent HIV treatment guidelines.

3.8.5 HIV and Co Morbidities:

In addition to AHID, HIV often presents with concurrent morbidities with infectious and non-communicable diseases. Comorbidities complicate HIV treatment, and may increase morbidity and mortality. Some of the co-morbidities are a result of the epidemiological synergy with HIV, e.g. Tuberculosis and sexually transmitted infections, while others especially NCDs are a consequence of long-standing ART or aging of HIV population.

3.8.6 TB/HIV Co-infection

The prevalence of HIV/TB co-morbidity remains high in Uganda, with TB still the leading cause of mortality among PLHIV. In 2019, 57,706 documented new or TB relapse cases were reported from health facilities, 98% had HIV status known. Among those with known HIV status, 43% (23,868) were HIV / TB co-infected; 31% of these being newly diagnosed (Figure 3.39). Nearly all (97%) of the identified TB/HIV co-infected clients were on ART, 58% of whom were newly started on ART. This HIV/TB cascade reveals the extent to which facilities are effectively linking HIV-infected TB patients to HIV treatment, testimony to successful integration of TB/HIV services

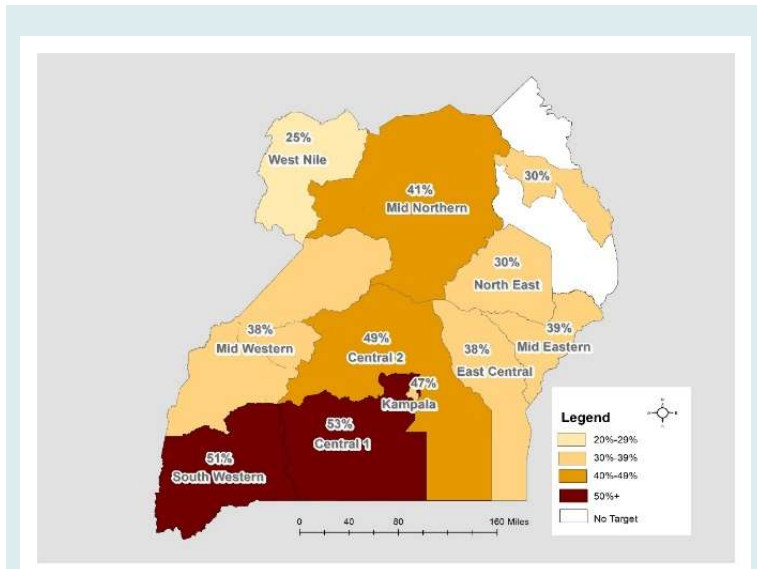


Figure 3.40: Geo-spatial distribution of TB/HIV co-infection in Uganda in 2019

Adult men appears to be disproportionately affected by TB relative to women (63% versus 37%). However, perhaps on account of their disproportionate HIV burden, women had higher HIV/TB co-infection prevalence. The geographical heterogeneity of TB/HIV co-infection is apparent in the country, where it ranged from 25% in West Nile region, to 53% in Central 1 region and in the South Western. This geospatial distribution appears to correlate with the distribution of HIV prevalence in 2016/17 UPHIA, Figure 3.40. These statistics justify the TB/HIV co-management strategies and TB preventive therapy (TPT) among PLHIV that are underway in the country.

3.8.7 HIV and Syphilis Co-Infection

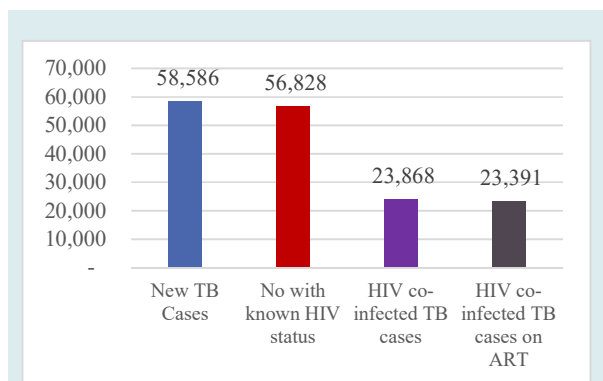


Figure 3.39 TB/HIV Cascade in Uganda 2019

Based on the Dual Path Platform (DPP Syphilis Screen and Confirm) POC assay, approximately 6.0% (6.1% among women, and 5.8% among men) in the 2016/17 UPHIA had ever has syphilis infection. HIV-positive participants were more than twice as

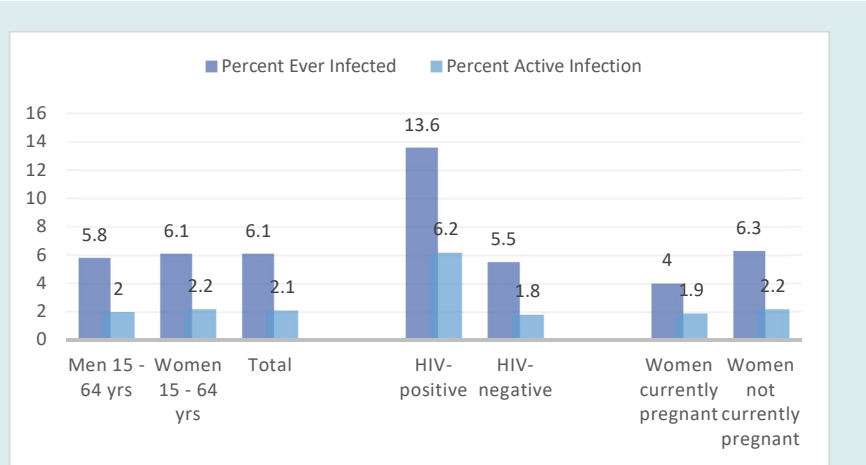


Figure 3.40: Prevalence of active and ever-infected with Syphilis among Adults 15 – 64 years by HIV Status and other covariates

likely to have ever had syphilis compared to HIV-negative participants 13.6% versus 5.5%, Figure 3.41. The prevalence of active syphilis infection among all adults was 2.1%, and was similar among women and men i.e. 2.2% and 2.0% respectively. HIV-positive respondents were more than three times likely to have active syphilis than HIV-negative respondent (6.2% versus 1.8%). Pregnant women with active syphilis are at high risk of transmitting congenital syphilis to their babies. About 2 percent of women that reported being currently pregnant had active syphilis, and 4 percent who had ever been infected, highlighting the magnitude of the risk of congenital syphilis. This highlights the continuing need for integration of HIV/STI management including use of dual screening platforms for HIV and syphilis that are being rolled out especially in ANC clinics.

3.8.8: HIV and Hepatitis B Virus Co-Infection

Approximately 4.7% of adult participants of 2016/17 UPHIA had Hepatitis B Virus (HBV) surface antigen (HBsAg) based on POC rapid tests, 5.4% among men, 3.0% among women, and 0.6% among children (0.7% among boys, and 0.6% among girls). There were no urban-rural disparities (2.3% and 2.5%), although there were significant regional disparities with the highest prevalence in the Mid-North (4.6%) and the lowest in the South-West region (0.8%).

HIV-infected individuals were more likely to be infected with HBV, with prevalence of HBV infection i.e. 4.7% HIV-positive adults (men: 6.3%, women: 3.8%), compared to 2.4% among HIV-negative adults (3.0% among men, 1.8% among women). Figure 3.41. These statistics also highlights the continued need for closer integration of HIV and HBV prevention and treatment services.

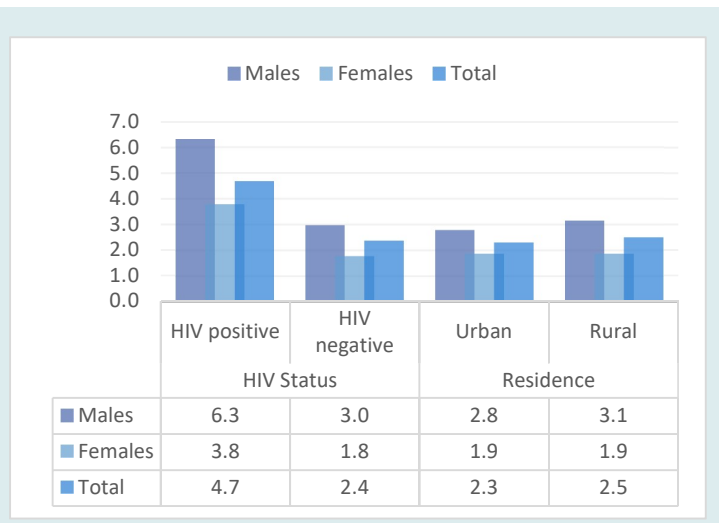


Figure 3.41: Prevalence of Hepatitis B Virus Surface Antigen by HIV Serostatus and Urban – Rural residence

Chapter 4: Analysis of HIV Programmes and Implementation

The strategy in this HIV investment framework, consistent with national HIV strategic plans is implementation to scale, of the prioritised package of proven and cost effective interventions. In moving forward with the national response, the country has prioritized fast tracking of the prioritised package of interventions that are projected to reduce new HIV infections and AIDS-related deaths to meet SDG targets. The “Fast Track Strategy” is composed of i) Antiretroviral Treatment, ii) HIV testing, iii) PMTCT based on the four-pronged strategy, iv) Safe Male Circumcision targeting young men aged 19-34 years, v) Condoms promotion and distribution; and vi) Behaviour Change Communication using multi-media approaches. Over the past decade, components of the package have been implemented using different service delivery approaches leading to increase in coverage and ultimately, reduction in HIV incidence and AIDS-related morbidity.

The Analysis Frame for HIV Programme and Implementation Analysis

For every HIV programme intervention reviewed, the following thematic aspects were examined:

- Background and context
- Evidence base
- Service delivery approaches
- Programme coverage
- Programme effectiveness and impact
- Cost-effective and returns for investment

In the sections that follow, an in-depth analysis of specific interventions are presented with highlights on their strategic contexts, evidence base, service delivery approaches, programme coverage, programme effectiveness and impact, as well as how to move forward with their implementation in the medium and long term. The analysis underscores the importance of evidence-based public health (EBPH). This is so because using EBPH approach to back the investment case has many direct and indirect benefits, including being informed by knowledge of what works, potential for program implementation to be successful, greater productivity, and more efficient use of resources. The evidence came from multiple sources.

To date, a big body of evidence is available to aid determination of whether investing in particular HIV interventions has good returns. Sarker et al in their review article that focused on sub-Saharan Africa (SSA)⁴² reported that a number of HIV intervention implemented have been effective in averting new HIV infections. The interventions were also found to be cost-effective. Similar findings have been reported by Galarraga et al who conducted a review that considered implementation of HIV programmes in SSA and other regions⁴³.

Sarkar S, Corso P, Ebrahim-Zadeh S, Kim P, Charania S and Wall K.: Cost-effectiveness of HIV Prevention Interventions in Sub-Saharan Africa: A Systematic Review. 2019 [EclinicalMedicine 10 \(2019\) 10–31](#).

This paper is based on a systematic review of 60 peer-reviewed studies that provided cost-effectiveness results for HIV prevention interventions. The interventions included among others; voluntary medical male circumcision, pre-exposure prophylaxis (PreP), testing as prevention (TasP), PMTCT, combination prevention (CP), condom distribution (CD), partner notification (PN) and cash transfer programmes (CTPs). The number of HIV infections averted (HIA), quality-adjusted life years (QALYs) gained and disability-adjusted life years (DALYs) averted were the outcome measures. The median cost-effectiveness ratio (CER) by intervention type was:

- VMMC - \$2967 per HIA and \$-388/DALY averted
- PreP - \$13,267 per HIA and \$799 per QALY gained
- TasP - \$7903 per HIA and \$890 per DALY averted
- PMTCT - \$1421 per HIA and \$191 per DALY averted or QALY gained
- Other biomedical interventions (CP, CD) - \$392/DALY averted
- Structural interventions (PN, CTPs) - \$3575/HIA and \$345/DALY

⁴² Sarkar S, Corso P, Ebrahim-Zadeh S, Kim P, Charania S and Wall K.: Cost-effectiveness of HIV Prevention Interventions in Sub-Saharan Africa: A Systematic Review. 2019 [EclinicalMedicine 10 \(2019\) 10–31](#).

⁴³ Galarraga O, Colchero MA, Wamai RG, et al. HIV prevention cost-effectiveness: a systematic review. BMC Public Health 2009;9:14. <https://doi.org/10.1186/1471-2458-9-s1-s5>.

Furthermore, a study in Rakai showed that combination prevention programmes (including VMMC, ART and SBCC) were scaled up during 2006-16, HIV incidence declined by 42%⁴⁴. In regard to programme effectiveness, this analysis assessed the extent to which programmes are contributing to or expected to contribute towards achievement of SDG targets. On the other hand, programme impact analysis looked at medium and long term effects of the interventions.

4.1 Safe male circumcision

Background and context

Safe male circumcision is a priority HIV prevention intervention with the potential for averting substantial HIV infections during the next decade. Since 2007, WHO and UNAIDS have recommended voluntary medical male circumcision (VMMC) as a key component of combination HIV prevention in countries with high HIV prevalence and low levels of male circumcision. In Uganda, the National Safe Male Circumcision Policy was launched in 2010⁴⁵ and technical guidelines for safe male circumcision (SMC) developed in 2011⁴⁶. However, service provision commenced after 2015. The guidelines provide for both surgical and non-surgical techniques, with the three recommended surgical circumcision techniques being: the dorsal slit technique, sleeve method, and forceps guided method. The non-surgical techniques employ medical devices such as PrePex, Tara clamp and Shangring. In case of device use, it is recommended to maintain the administration of two TT vaccination doses where SMC clients are offered TT on day 0 before the circumcision procedure is performed and a second dose on day 28. The SMC policy was revised in 2019⁴⁷, to provide for active targeting and for demand creation. Although in principle the policy provides for circumcision of all age groups targeting sexually active males is prioritised to maximize the public health benefit. Other age groups may be circumcised based on evidence and availability of resources.

Over the last decade, substantial progress has been made in SMC service delivery. Capacity building through training of personnel for SMC has been done, and by June 2020, a total of over 4 million males cumulatively had been circumcised.

Evidence base:

The national SMC policy was informed by evidence from several studies. Uganda was among three countries that participated in a multicountry randomized clinical trials that determined the effectiveness and safety of SMC in reducing HIV transmission. The trial showed that SMC reduces female-to-male sexual transmission of HIV by 60%^{48,49,50}, and formed the basis for WHO recommendation for VMMC in countries with a high HIV prevalence in the general population. The policy is also supported by evidence of cost-effectiveness as VMMC averts new HIV infections, thereby reducing future need for HIV treatment. Moreover, medical male circumcision is a one time off procedure, although, by itself, it only provides partial protection

⁴⁴ Grabowski MK, Serwadda DM, Gray RH, Nakigozi G, Kigozi G, Kagaayi J et al. HIV prevention efforts and incidence of HIV in Uganda. *N Engl J Med.* 2017;377(22):2154-66.

⁴⁵ Ministry of Health.: National Policy for Safe Male Circumcision. 2010.

⁴⁶ Ministry of Health.: Minimum Standards for Safe Male Circumcision. 2011.

⁴⁷ Ministry of Health. Safe Male Circumcision Policy. Revised December 2019.

⁴⁸ Auvert B, Taljaard D, Lagarde E, et al. [Randomized, controlled intervention trial of male circumcision for reduction of HIV infection risk: The ANRS 1265 trial.](#) *PLoS Medicine* 2005;2(11):e298.

⁴⁹ Gray, RH, Kigozi G, Serwadda D, et al. [Male circumcision for HIV prevention in men in Rakai, Uganda: a randomised trial.](#) *The Lancet* 2007;369:657-666.

⁵⁰ Bailey RC, Moses S, Parker CB, et al. [Male circumcision for HIV prevention in young men in Kisumu, Kenya: a randomised controlled trial.](#) *The Lancet* 2007;369:643-656.

and should be implemented as part of a comprehensive package. Studies have also showed acceptability of SMC; a study in Uganda showed that circumcision using PrePex non-surgical device is acceptable. Among 300 men who underwent PrePex circumcision, 97% expressed satisfaction with the penile scar appearance and the absence of pain following the procedure⁵¹.

Service delivery approach

Safe male circumcision services in Uganda have been predominantly delivered through vertical approaches in form of circumcision camps. Most financial support for SMC comes from the US PEPFAR. To a small extent, services are provided at health facilities as part of integrated service delivery. Due to this, coverage of services has remained low, and the approach may not be sustainable. The NSP 2020/21 – 2024/25 has emphasized that a systems service delivery approach should be strengthened in order to sustain the services.

Programme coverage of male circumcision

The NSP 2020/21 – 2024/25 proposes scaling up SMC to males of all age groups. Like the HSHASP, it underscores the need to prioritise adolescents and young men aged 15 – 34 years. The UPHIA 2016/17 data revealed that 42.2% of male respondents aged 15-49 years reported being circumcised. In 2011, 26% of men reported to have been circumcised (UAIS 2011). UPHIA 2016/17 further showed that of the 42.2% of men who reported being circumcised, 21.7% were medically circumcised while 20.5% reported non-medical circumcision under religious and cultural settings. The survey further showed variability in coverage of SMC by age groups, wealth quintile, geographic regions, and urban/rural divide. About 16.1% of men in the lowest wealth quintile reported being circumcised compared to 32.8% of those in the highest wealth quintile. SMC coverage was highest at 29.8% among men aged 20-24 years. The MC coverage in June 2020 was estimated to be 43% indicating no progress since 2019 (JAR 2020), partly due to COVID-19 pandemic. Following the onset of COVID-19 pandemic in Uganda, community SMC outreaches were halted in April 2020. The above figures indicate that the current coverage level of safe male circumcision is still low in Uganda and far below the national target of 80%. In order to improve SMC coverage, targeted approaches that can reach the younger age groups and key populations should be implemented.

Programme effectiveness and impact

By itself, male circumcision only partially protects men from HIV transmission and should be provided as part of a comprehensive HIV prevention package. In addition SMC has other benefits - it reduces the risk of transmission of STIs, penile cancer among men and cervical cancer among female sexual partners. While infants can be circumcised, the HIV prevention benefit will come after many years when they grow up and become sexually active.

A number of studies have assessed the cost-effectiveness of SMC. The box below contains the list of parameters considered in studying the cost-effectiveness of SMC. Duffy and colleagues studied the reach and cost-effectiveness of circumcision methods comparing PrePex and surgical circumcision and found that PrePex method was slightly costlier but more efficient than surgical circumcision⁵². Within the same time frame, 24 PrePex circumcisions were performed compared to 16 surgical circumcisions. The study concluded that PrePex, a non-surgical SMC device, is overall cost-effective and that it has a better reach (60% higher) compared to the sleeve-resection method. However, use of PrePex was costlier, the unit cost

⁵¹ M. Galukande, F. Nakaggwa, E. Busisa, D. Sekavuga Bbaale, T. Nagaddya, and A. Coutinho.: Long term post PrePex male circumcision outcomes in an urban population in Uganda: a cohort study. 2017 Oct 30. doi: 10.1186/s13104-017-2845-9

⁵² Duffy K, Galukande M, Wooding N, Dea M, Coutinho A (2013) Reach and Cost-Effectiveness of the PrePex Device for Safe Male Circumcision in Uganda. PLoS ONE 8(5): e63134. doi:10.1371/journal.pone.0063134

per procedure using PrePex was 35% higher when compared to the sleeve-resection surgical method. Additional benefits of use of PrePex included ease of use, shorter time to complete (30 minutes) and can be performed by lower level staff. Other studies have examined the cost-effectiveness of targeting specific age categories; a modelling study in Uganda revealed that targeting males aged 15-34 years is more cost-effective than targeting males aged 15-45 years⁵³. The cost per HIV infection averted between 2014 and 2028 for each age-targeted strategy alongside that for the then national strategy of SMC that target males aged 15-49 years, revealed that the most cost-efficient strategy was circumcising men aged 15–34, which would cost US \$1,100 per HIV infection averted. The least efficient strategy was the one focusing on circumcising males 10-24 years that would cost US\$ 2,100 per HIV infection averted. Furthermore, the study showed that circumcising the 20-34 year-olds will have the fastest impact on HIV incidence and requires the fewest circumcisions for each HIV infection averted.

Moving forward

Based on the current coverage gaps of SMC in Uganda, and the potential for averting future infections, continued investment in SMS services is compelling. SMC has been included in the prioritised scenario for this investment case framework and is cost-effective. The following recommendations should be considered as we go forward:

- Increase domestic funding for SMC services to break the cycle of the programme being heavily donor dependent, and enhance sustainability.
- Target young adult males and key populations with the aim of reaching at least 80% of men aged 15 to 34 years. This approach will have the greatest impact of SMC services.
- Address the rural/urban disparity of SMC services by strengthening capacity for SMC at HCIV. SMC is a component of the minimum package of services to be provided at HCIV⁵⁴.
- Increasingly integrate SMC services within surgical services provided by health facilities.
- Use a combination of surgical and non-surgical techniques. Non-surgical techniques have the advantage of being easier to conduct and can be done by midlevel health workers.
- Intensify SBCC for SMC targeting women to facilitate the understanding of the benefits of circumcision to women.
- Review and update the national safe male circumcision technical guidelines.

4.2 HIV Care and Treatment

Background and context

Access to anti-retroviral treatment (ART) in Uganda through the public health system significantly improved during the past decade, dramatically improving the health and wellbeing of PLHIV countrywide and averting many AIDS-related deaths. To date, various types of highly potent ARVs are being used in combination to enhance their potency and to avoid drug resistance. The majority of HIV infected people (~90%) are currently on first-line ARV drugs. Generally, the second and third-line drugs are more expensive than the first line drugs.

Evidence base

There is a big body of research evidence in support of the role of ART in attaining HIV epidemic control with ART being used for the dual purpose of HIV prevention and treatment. Over the last three decades, the World Health Organization developed a succession of HIV

⁵³ Kripke K, Vazzano A, Kirungi W, Musinguzi J, Opio A, Ssempebwa R, et al. (2016) Modeling the Impact of Uganda's Safe Male Circumcision Program: Implications for Age and Regional Targeting. PLoS ONE 11(7): e0158693. doi:10.1371/journal.pone.0158693

⁵⁴ Ministry of Health.: Consolidated guidelines for the prevention and treatment of HIV and AIDS in Uganda. February 2020.

care and ART guidelines to provide guidance to countries to adapt their own guidelines⁵⁵. The WHO guidelines include those for ART initiation, ARVs to use (first and second line drugs), use of ARVs for PMTCT, PrEP and PEP. Given the dynamics of new evidence the guidelines have evolved, the latest of which promotes the current “test and treat” strategy.

In Uganda, achievements in health system strengthening have been made to enhance the rapid scale up of ART. The NSP 2015/2016 – 2019/2020 prioritized ART service provision, partly based on accumulated evidence that ART can reduce HIV transmission, hence reduction in HIV incidence and HIV prevalence, as well as reduction in AIDS-related mortality. A number of national ART-related policies and guidelines have been developed to support service delivery. They include: i) The Consolidated guidelines for the prevention and treatment of HIV and AIDS in Uganda, February 2020; ii) The HIV Testing Services Policy and Guidelines that provide guidance on HIV diagnosis to identify people who should be initiated on ART; iii) Technical Guidance on PreExposure Prophylaxis (PrEP) for persons at high risk of HIV in Uganda. The guidelines have enabled implementation of PrEP as part of the combination HIV prevention package; iv) Post-Exposure Prophylaxis Guidelines; v) National Health Laboratory Policy and Guidelines, 2009. The policy and guidelines have facilitated support for HIV sample referral and testing through laboratory networks

Service delivery approaches

Antiretroviral treatment is one of the priority high impact interventions under the Fast Track to HIV epidemic control in Uganda. In line with this strategy, plans have been made to scale up ART services to attain the second 95 of the triple strategy, such that by 2020, ninety-five percent of adolescents and adults living with would know their HIV status and 95% of them would be enrolled and retained on ART (HSHASP 2017/18-2022/2023). Thereafter, this level of ART achievement is expected to be sustained. Currently, ART services are supported from different sources including GoU domestic funding, the Global Fund, and the US PEPFAR.

In regard to service delivery mechanisms, multiple approaches are in use to provide HIV treatment. At health facility levels, ART services are integrated within the broader HIV services. However, in order to relieve health facilities from the burden that comes from congestion by patients, innovative client centred approaches such as the Differentiated Services Delivery Model has been adopted. The DSDM provides patient-centred care in facilities and communities to enhance linkage to care and ART initiation. A client-friendly drug refill programme (Fast Track Drug Refill) is being implemented to enhance retention to treatment. Also, ART services were decentralized to peripheral health facilities and community level. The national guidelines recommend multi-month prescriptions of ARVs for up to 6 months for eligible stable clients in whom frequent drug pickups may compromise their adherence to ART. This is more so with the key populations, migratory people and those in hard to reach settings.

Programme coverage

During the past two decades, Uganda has made significant gains in the delivery of ART services. Implementation of the “Test and Treat” strategy has been credited for the rapid scale up of ART services. The 2017 HIV Prevention and Treatment Guidelines provides for the roll out of this strategy. By March 2020, a total of 1832 health facilities were providing ART services (JAR 2020). One of the objectives of the NSP 2015/2016 – 2019/2020 was “Increasing Access to ART to > 95%, and Sustaining Care Provision”, by ensuring all PLHIV in the country to have access to ART and support for adherence and retention. Good progress has been made

⁵⁵ WHO 2019 Antiretroviral Treatment Guidelines

towards the achievement of this objective; by end of 2020, over 2.27 million PLHIV were on ART, the ART coverage among all PLHIV was reported to be 92, beyond the 90% target set under the NSP and the UNAIDS target of 90% (JAR 2020). Noteworthy also is the disparity in ART coverage by age and gender. ART coverage was higher among adults at 92% compared to 61% among children aged 0-14 years. The ART coverage among females was 94% compared 79% in males. In regard to retention on treatment, the 12-month retention after ART initiation was 79% in June 2020, below the NSP target of 90%. Furthermore, 59% of all ART patients were reported enrolled on ART and in stable conditions with the majority being on the Fast Track Drug Refill. The other drug refills models in use are; the multi-month drug dispensing strategy that was adopted in 2019 giving priority to stable clients and the urban community pharmacy refill model that involves partnership between a private community pharmacy and a public ART facility. Success of the latter has been registered in Kampala where in 2017 alone, more than 15,000 clients were enrolled.

While there have been successes in adult ART, some challenges have been noted in children. Children’s care across the continuum is suboptimal due to low case identification among infants. Poor retention of the Mother-Baby pairs is partly responsible for this; it leads to poor linkage to the Early Infant Diagnosis programme. Also, there is sub-optimal diagnosis of HIV among older children and adolescents. Furthermore, poor linkage to care and ART retention have been experienced due to non-disclosure of HIV status, stigma, discrimination and violence, lack of information, stress and inadequate support.

Programme effectiveness and impact (Return for investment)

From a public health aspect, the long-term objective of antiretroviral treatment is reduction of HIV incidence, resulting from population level viral suppression. At individual level, ART leads to viral suppression and reduces AIDS-related morbidity. From the economic aspect, investment in ART has good returns. Early ART initiation is cost-effective because it leads to viral suppression and reduction of population level HIV viremia⁵⁶ with subsequent reduction in HIV incidence and averting new HIV infections. ART also leads to improvement in the quality of lives of PLHIV, reduction in AIDS-related deaths, and more productive population to contribute to national development and economic growth. Based on a systematic review of 15 CE studies of ART from various countries including South Africa, Gupta and colleagues reported that that irrespective of the country, target group, qualifying criteria for ART, and other parameters, ART strategies have been cost-effective⁵⁷.

- | |
|--|
| <p>Outcomes for determination of cost-effectiveness of ART</p> <ul style="list-style-type: none"> • Cost per one HIV infection averted • Cost per one AIDS-related death prevented • Cost by disability adjusted life years (DALYs) • Cost per quality adjusted life years (QALYs) |
|--|

The declines in HIV incidence and AIDS-related deaths that have been reported in Uganda⁵⁸ among all age groups are partly due to ART roll out. Also, ART has had impact on HIV prevalence; this has remained stable for most of the past 15 years at 6% - 7% as HIV treatment has been scaled up⁵⁹.

⁵⁶ Paweł Kozłowski, Anna Grzeszczuk, Robert Flisiak.: Justification for early introduction of antiretroviral therapy. *Przegl Epidemiol.* 2014; 68: 5 - 9

⁵⁷ Gupta I, Singh D. Cost-Effectiveness of antiretroviral therapy: A systematic review. *Indian J Public Health* 2020;64:S32-8.

⁵⁸ UNAIDS. UNAIDS data 2019.

⁵⁹ AIDS Control Programme.: The 2019 HIV Epidemiological Surveillance Report for Uganda. March 2020.

Moving forward

To date, the scale up of ART in Uganda has led to 90% of identified PLHIV being initiated on treatment and a viral suppression for 90% of those on treatment (JAR 2020). To achieve the national goal of HIV control, continued invest in ART is necessary so as to sustain the above gains. Implementation of client-centred approaches such as the DSDM should be enhanced to scale. The NSP strategic actions of increasing the proportion of diagnosed HIV persons who start antiretroviral therapy to 95% by 2025, increasing the proportion of diagnosed HIV persons who start ART within one month and increasing the proportion of HIV-positive pregnant women who receive antiretroviral drugs to reduce risk of mother-to-child transmission of HIV to 95% by 2025 are realistic. The box below presents a summary of recommended ART

Box: Recommendations for ART service delivery in the next decade

- The target set by the HSHASP to attain a 95% treatment initiation and a 95% retention to treatment at one year for all initiated adults, adolescents and children living with HIV on antiretroviral treatment is realistic
- Continue rolling out ART services part and parcel of the of “Test & Treat” and “Fast Track” strategies
- Implement initiatives to improve the coverage and quality of antiretroviral treatment
- Enhance use of people-centred service delivery models in programme implementation
- Continue to strengthen the linkages of clients to antiretroviral treatment
- Further improvement of retention and adherence to antiretroviral treatment
- Continue to support care and antiretroviral treatment for the in-school children, adolescents and young people living with HIV
- Optimise antiretroviral treatment regimens that enhance treatment compliance

activities for implementation during the next decade.

4.3 HIV Testing Services

Background and context

HIV testing remains a cornerstone for HIV epidemic control, representing the continuum from HIV prevention to care and treatment, and central to the diagnosis of HIV and identification of persons living with HIV. It represents the first 90 of the HIV testing and treatment cascade. Early diagnosis of HIV, linkage to care and support services improves clinical outcomes. For HIV positive pregnant women, early diagnosis is vital for prevention of mother to child HIV transmission. In this investment framework, HTS is a component of the “prioritized scale up scenario package” that has been adapted. It is also in “fast track initiative” under the HSHASP.

Evidence base

HIV testing services in Uganda date back to the onset of the HIV epidemic in the country. The national guidelines for HIV counselling and testing have evolved over the years^{60,61}. The guidelines provided a framework for providing HTS in Uganda as part of the wider health care system, and also spell out different types of HTS available for different circumstances; including routine testing in clinical settings, home based HCT, etc. Recently, The Ministry of Health finalized revision of the HCT Policy and Implementation Guidelines. The latest

⁶⁰ Uganda. Ministry of Health. 2003. Uganda National Policy Guidelines for HIV Voluntary Counselling and Testing. Kampala: Ministry of Health.

⁶¹ Uganda. Ministry of Health. 2005. Uganda National Policy Guidelines for HIV Counselling and Testing.

guidelines, “The February 2020 Consolidated Guidelines for the Prevention and Treatment of HIV and AIDS in Uganda”⁶² provides a very comprehensive guidance on HTS.

Service delivery approaches

Based on the national guidelines, two main approaches are recommended for HTS delivery; and they are being implemented in the country. These are; the Provider-initiated HIV testing and counselling (PITC) and the Client-initiated testing and counselling (CITC). Based on the location where the services are provided, two forms of HTS delivery approaches are in use; the facility-based HTS and community-based HTS. The Facility-based HTC include: i) Provider-initiated HTC: Routine HTC, testing at outpatient department (OPD), Diagnostic HTC, and Index client HTC; and ii) Client-initiated counselling and testing: Testing at other testing points or health facility based drop in centres. The community-based HTS being implemented include: i) Provider-initiated HTS: Home based HTC, Snowballing, Social net-working strategy and HTC in Education Establishments for sexually active youth; and ii) Client-initiated counselling and testing: Outreach/mobile HTC and HTC at Community drop in centres.

Furthermore, in order to address the needs of different clients, some client-centred HTC approaches are being implemented. This entail targeting some groups of people in order to get better yield. For instance, identification of PLHIV within a population where most of the people already know their sero-status is difficult and not efficient. A more efficient approach is targeting sub-groups such as persons who report sexual relationship with multiple concurrent partners, members of key or priority population, sexual contacts to index clients and being in discordant relationship. Another approach is the Differentiated HTC service-delivery model that are adapted to address the specific conditions of a subgroup of individual clients. The DSDM provides patient-centred care in facilities and communities. At district, sub-district and community level, HCT services have been decentralized.

Programme coverage

Coverage of HTS is very high in Uganda with over 90% of PLHIV already aware of their HIV sero-status. By June 2020, the number of HIV testing sites was reported to have reached 5,000 providing an array of HTS services. In 2019/20 alone, over 6 million individuals were tested for HIV (JAR 2020). The proportion of people tested and know their results however vary between males and females, have regional disparity and vary between urban and rural areas.

The coverage of the new HTC approaches introduced in the last few years is steadily increasing. The Assisted Partner Notification (APN) was first piloted in two districts (Kiboga and Rakai) in 2016/17 financial year but has now been rolled out to 96% of health facilities, HIV self-testing coverage is 32% nationally, and the “Recency Testing” used for HIV surveillance is being implemented in 147 health facilities of the level HC III and above.

Programme effectiveness and impact

Studies have shown that HTC is cost-effective. Two cost-effectiveness outcome measures that have been commonly used in the assessment of HTC cost-effectiveness are the cost per HIV infection averted and the cost per DALY saved. In this analysis, we have considered both direct and indirect effectiveness of HTC. The effectiveness of HTC in HIV diagnosis and identification of PLHIV was also examined.

⁶² Uganda. Ministry of Health. 2020. The Consolidated Guidelines for the Prevention and Treatment of HIV and AIDS in Uganda.

Over the five years of NSP 2015/2017 – 2019/2020, approximately 8 million people were tested for HIV annually (JAR 2020), with the majority of the people who tested HIV-positive linked to care and treatment. HIV testing has also been instrumental in the national PMTCT programme and HIV surveillance to monitor trends in HIV infection in the country. In regard to PMTCT, it has facilitated the identification of pregnant women with HIV infection and their initiation on ART to avert MTCT. Other areas where HTS has been instrumental is the HTS for special groups such as key populations and discordant partners to prevent HIV transmission among sexual partners. All these approaches have the ultimate potential benefit of contributing to the reduction of HIV incidence and AIDS-related mortality.

The cost of HTS varies by delivery approach. The home-based HCT was shown to be cheaper than facility based HCT. In their study in south-Western Uganda, Mulogo and colleagues reported that VCT was the least costly strategy per client tested and was cost effective in identifying HIV sero-positive clients in rural Uganda⁶³. The cost per client tested were US\$ 6.4 for facility based VCT, and US\$ 5.0 for home based VCT. The cost per HIV positive case identified was US\$ 86.5 for facility based VCT, and US\$ 54.7 for home-based VCT. Another study assessed cost and effectiveness of four HCT strategies in Uganda; namely, stand-alone HCT; hospital-based HCT; household-member HCT; and door-to-door HCT⁶⁴. It revealed that hospital-based HCT most readily identified HIV-infected individuals eligible for treatment and HBHCT strategies reached the largest proportion of previously untested individuals.

Moving forward

In line with the 90by90by90 strategy, the original UNAIDS and NSP target for HTS was 90% of all people living with HIV should know their HIV status by 2020. However, to fast track the achievements, a more ambitious, the “Super-Fast Track” target of 95-95-95 by 2020 was later adopted. In moving forward, this target and achievements should be maintained. HIV testing services will play a pivotal role in enhancing care across the continuum. Therefore, HTS should be scaled up using the targeted and differentiated service delivery models. Special efforts should be put to address the disparities in knowledge of status by urban/rural divide, geographical region and sub-populations such as key and priority populations.

4.4 Prevention of Mother to Child Transmission of HIV

Background and context

Uganda’s long standing programme for prevention of vertical transmission of HIV dates back to the early 1990s. The programme is based on a the four-prong approach; namely: (i) primary prevention of HIV infection among women of reproductive age and their partners; (ii) prevention of unintended pregnancy among women living with HIV; (iii) provision of life-long HAART to prevent HIV transmission from women living with HIV to their infants; and (iv) provision of treatment, care and support to women living with HIV, their children and their families. To date, progress has been made; implementation has been scaled up countrywide, over “95% of HIV positive pregnant women are receiving PMTCT services. The corresponding targets for this goal were, 75% of HIV exposed infants (HEI) receiving a 1st DNA PCR test and 70% of HEI receiving a 1st DNA PCR test within 2 months of birth. To enhance HIV

⁶³ Mulogo EM, Batwala V, Nuwaha F, Aden AS, Baine OS.: Cost effectiveness of facility and home based HIV voluntary counseling and testing strategies in rural Uganda. *African Health Sciences* 2013; 13(2): 423 - 429 <http://dx.doi.org/10.4314/ahs.v13i2.32>.

⁶⁴ Menzies N, Abang B, Wanyenze R, Nuwaha F, Mugisha B, Coutinho A, Bunnell R, Mermin J and Blandford JM.: The costs and effectiveness of four HIV counseling and testing strategies in Uganda. *AIDS* 2009, Vol 23 No 3.

diagnosis in infants, all infants with an initial negative HIV DNA test result at six weeks of age are retested at six months of age.

Evidence base

The first ground breaking evidence showing the efficacy of ARVs given to HIV positive pregnant women in reducing mother to child transmission of HIV came from Uganda, from a randomized trial of intrapartum and neonatal single-dose nevirapine compared with zidovudine for prevention of mother-to-child transmission of HIV-1⁶⁵. Based on the findings, WHO and its partners recommended that MTCT prevention using antiretroviral drugs such as nevirapine should be included in the minimum standard package of care for HIV-positive women and their children⁶⁶. Since then, more evidence has accumulated showing the effects of more efficacious HAART on MTCT. The evidence has evolved and current updated evidence⁶⁷, supports the Option B+ strategy that involves providing triple ARV drugs to all HIV-infected pregnant women continuing for life. To pave way for the use of research evidence to support PMCT programme implementation, global guidelines were developed by the WHO and later adapted at country level⁶⁸. In Uganda, PMTCT guidelines have evolved and guide service delivery.

Service delivery approaches

The PMTCT services are being provided using a combination of service delivery approaches. These include: i) Integrated service delivery; ii) Differentiated service delivery; and iii) Targeted service delivery. The Moh 2020 Consolidated guidelines for the prevention and treatment of HIV/AIDS in Uganda recommends integrating EID with EPI services in order to increase infant HIV testing, increase early diagnosis, improve enrolment in EID and ultimately improve maternal retesting. The guidelines also stipulate that within the eMTCT framework, the adolescent friendly RH/PMTCT services should be established. DSD approaches are also being used in which, after the initial individual ANC/PNC visit, subsequent MCH/PMTCT care is provided in a group setting with most of the time dedicated to facilitated discussions.

Programme coverage

Over the years, PMTCT services have been scaled up in Uganda reaching a nationwide coverage. Based on the most recent Joint Annual Review of the AIDS programme in Uganda, the 2020 JAR documented that as of June 2020, PMTCT services were being provided at 73% of health facilities that run antenatal care services; HIV testing in ANCs was available in almost all health facilities except for some HC IIs; DSDM for PMTCT have been rolled out in all districts; Family Support Groups have been scaled up to all PMTCT implementing facilities; the Retention Initiatives have been adopted as a best practice for enhancing retention in PMTCT programming; implementation of Bring Back Mother and Baby Campaigns is ongoing in all districts; implementation of Assisted Partner Notification is expanding; and Partner Testing was done at 38% of PMTCT settings.

⁶⁵ Guay LA, Musoke P, Fleming T, Bagenda D, et al.: Intrapartum and neonatal single-dose nevirapine compared with zidovudine for prevention of mother-to-child transmission of HIV-1 in Kampala, Uganda: HIVNET 012 randomised trial. *Lancet* 1999;**354**:795-802.

⁶⁶ World Health Organization.: Nevirapine Statement. WHO reconfirms its support for the use of nevirapine to prevent mother-to-child transmission of HIV. July 2003.

⁶⁷ World Health Organization.: Programmatic update. Use of Antiretroviral Drugs for Treating Pregnant Women and Preventing HIV Infection in Infants. April 2012.

⁶⁸ World Health Organization, 2010. Antiretroviral drugs for treating pregnant women and preventing HIV infections in infants: recommendations for a public health approach, 2010 version. <http://www.who.int/hiv/pub/mtct/guidelines/en/>.

In terms of the target population coverage, the proportion of HIV-infected pregnant women that receive any kind of ARVs for PMTCT has increased from 34% in 2007 to 53% in 2009 and 95.3% in 2017 (UPHIA 2016-2016). The proportion of HIV positive women who gave birth in the 12 months preceding the survey and self-reported using ART during pregnancy was 95.3%. The survey further revealed that 90.9% of mothers who gave birth within the 12 months preceding the survey knew their HIV status and 72.9% of HIV-positive mothers who gave birth in the 12 months before the survey were on ART before pregnancy.

Programme effectiveness and impact

Implementation of PMTCT services has drastically reduced vertical transmission of HIV in Uganda and averted many infections. Over the last decade, there has been a sustained decline in the number of infants born with HIV. Similarly, perinatal infections have steadily decreased; the estimated MTCT based on birth cohort monitoring dropped, see table 3.4. Data from early infant diagnosis rapid testing present a similar picture. It is further estimated that although there were MTCT HIV infections in Uganda in 2019, the number of MTCT HIV infections averted was 16,100. The above successes are partly attributed to the Option B+ Strategy for PMTCT whose implementation started in 2013. The strategy involves immediate initiation of ART for pregnant women for life regardless of CD4 count and exclusive daily nevirapine (NVP) prophylaxis for all HIV-exposed infants at birth for six weeks. The other PMTCT programme impact has been on the survival of children born with HIV where the number of children living with HIV has been falling, due to PMTCT interventions, a big proportion has aged out of childhood.

Criteria for determination of cost-effectiveness of PMTCT

- Number HIV infections averted among HIV exposed infants
- AIDS-related mortality averted among infants and young children
- Disability of life years saved

Moving forward

Although the national programme for elimination of mother to child HIV transmission (eMTCT) has been effective the burden of paediatric is still high, thus requiring continued actions. Among infants born in the 17 months prior to UPHIA 2016/17, to HIV-positive women, 14.8% and 15.6% of those aged 0-11 and 0-17 months were confirmed positive by virological testing performed as part of the survey, respectively. Furthermore, the UPHIA revealed that among infants born in the last 17 months to HIV-positive women who were already on ART at first ANC visit, 3.4% were confirmed positive by virological tests. Also, there are still some bottlenecks that are adversely affecting eMTCT programme performance; including sub-optimal testing of infants and young children.

The NSP 2020/2021 – 2024/2025 and the HSHASP 2017/2018-2022/2023 have provided for comprehensive eMTCT programme interventions that should be implemented to scale in order to optimize programme coverage, effectiveness and impact. The bottlenecks identified should be addressed. Paediatric HIV testing should be strengthened. Innovative approaches to retain mother-baby pairs, reduce high maternal HIV incidence are necessary such as PrEP for pregnant and lactating mothers.

4.5 Condom Promotion and Distribution

Background and context

Consistent and correct use of condom during sex as a barrier method to prevent HIV transmission has been promoted especially for with non-regular partners. Before 1991, condom promotion in Uganda faced challenges of misconceptions, religious opposition, and being

mistakenly associated with promiscuity⁶⁹. In 1991, condom promotion started on the basis of a “quiet condom promotion policy” as part of the “ABC strategy” of abstinence, being faithful and condom use. Condom promotion and distribution was done by the public sector and private sector. In the early 1990s, social marketing of condoms by the private sector using different brands, such as Protector Condoms, Ngabu, and Life Guard was undertaken. Condom promotion subsequently took root with the number of condoms procured in country rising from 10 million in 1994 to 30 million in 1997 and then 120 million in 2003 reaching 183 million in 2013⁷⁰. However, following the declaration of the UNAIDS strategy of 3 by 5 for antiretroviral treatment, the promotion of the ABC strategy took a low ebb. Due to this, a recommendation was made to simultaneously promote the ABC strategy and the 3 by 5 ART strategy as both would be complementary (Okware et al). To date, condom promotion and distribution is accepted and is part of the combination HIV prevention strategy.

Evidence base

Currently, condom promotion and distribution in the country is supported by the national and global, policies and guidelines and is part of the National Overarching AIDS Policy. The consolidated HIV prevention guidelines provide for condom promotion and distribution using a total market approach to ensure availability of condoms to all sectors of the population. The National Condom Programming Strategy 2013 – 2015 provided for creation of demand for condoms through advocacy; comprehensive condom programming; improved condom-related education; and increased social marketing of condoms⁷¹. At international level, WHO and UNAIDS have issued statements based on evidence that condoms work and should be an integral component of HIV prevention strategies^{72,73,74,75}. A new National Comprehensive Condom Programming Strategy & Implementation Plan 2020 – 2025 has just been signed off⁷⁶.

Service delivery approaches

The new condom promotion strategy emphasizes a people-centred approach based on a Total Market Approach (TMA) is being implemented to ensure availability of condoms to all population sectors. Under this, some clients access free condoms while others access subsidized or full cost condoms from social marketing and the commercial sector, respectively. Condom promotion targets populations that are at high risk of HIV transmission or acquisition, including adults and youth engaged in multiple sexual partnerships, and men and women who engage in transactional sex and their clients, and Persons living with HIV. Condom promotion and distribution is also part of prevention services for adolescent friendly risk-reduction interventions to prevent HIV, teenage pregnancy, and other STIs.

⁶⁹ Okware S, Kinsman S, Onyango S, Opio A, et al.: Revisiting the ABC strategy: HIV prevention in Uganda in the era of antiretroviral therapy, 2005. *Postgraduate Medical Journal*, 2005.

⁷⁰ Makerere University, School of Public Health.: *Rapid Assessment of Comprehensive Condom Programming in Uganda*. Report Submitted to the Ministry of Health. 2015.

⁷¹ Uganda Ministry of Health.: *National Condom Programming Strategy 2013 – 2015*.

⁷² UNAIDS. *Position statement on condoms and HIV prevention*. Geneva: UN, 2004.

⁷³ WHO/UNAIDS. *Information note on Effectiveness of Condoms in Preventing Sexually Transmitted Infections including HIV*. Geneva. August 2001.

⁷⁴ Holmes KK, Levine R, Weaver M. Effectiveness of condoms in preventing sexually transmitted infections. *Bull WHO* 2004;82:454–61.

⁷⁵ Ahmed S, Lutalo T, Wawer M, et al. HIV Incidence and sexually transmitted disease prevalence associated with condom use: a population study in Rakai, Uganda. *AIDS* 2001;15:2171–9.

⁷⁶ Uganda Ministry of Health.: *National Comprehensive Condom Programming Strategy & Implementation Plan 2020 – 2025*. September 2020.

The key strategic principles that underpin the national condom promotion and distribution include: i) Condoms should be provided to the end user at no cost through the public sector

As part of condom promotion, the following activities are recommended to target high-risk populations (Source: HSHASP):

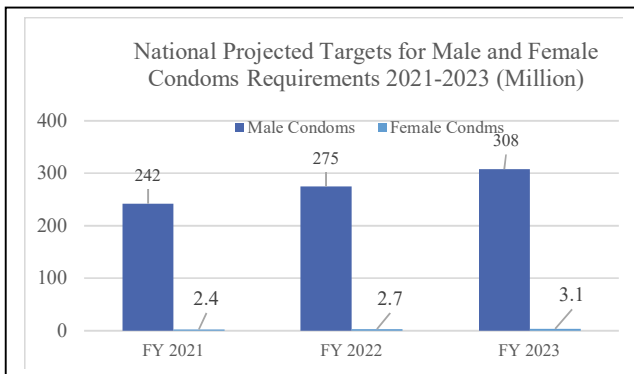
- Conduct of active, targeted promotion of condom use through road shows and media campaigns.
- Procurement and distribution of condoms and dispensers to hotspots and health facilities.
- Identification and engagement of condom champions from among the PLHIV.
- Conduct of condom education and building negotiation skills among KP/PPs.
- Establishing and functionalising condom coordination teams at the district level.

supply chain and at a minimum cost through the social marketing sector; ii) Distribution of condoms should cover community outlets; iii) Use non-traditional condom distribution outlets, such as public offices, hotels, places of entertainment and social gatherings in order to improve access; iv) Distribution of condoms should be demand-driven using “pull” instead of “push” supply systems; and v) Supporting the private sector to ensure that no clients are left out.

Programme coverage

Data shows a mixed picture on condom uptake. The UPHIA 2016-17 shows that of men who reported having had sexual intercourse in the 12 months preceding the survey, 37.0% used a condom during their last sexual intercourse with a non-marital, non-cohabitating partner, falling from 53% in 2005, Figure 3.28. Condom use was higher (44.7%) in urban areas, compared to 33.2% in rural areas. Similarly, condom use varied by region, from 25.8% in Mid-West region to 52.2% in Kampala. The survey also shows that 21% of women who had two or more partners in the past 12 months reported using a condom during their last sexual intercourse. Among men who had two or more partners in the past 12 months, 22% of them reported using a condom during their last sexual intercourse. The above figures indicate a big gap since nearly two-thirds of sexually active adults who reported sexual intercourse with a non-marital, non-cohabitating partner in the 12 months preceding the survey reported not using a condom at last sexual intercourse with such a partner. Additionally, the trend is condom use during higher risk sex shows stagnation in both men and women between 2011 and 2017.

There has been a steady increase in the number of condoms procured. A total of 138 million male condoms were distributed in 2019 and ~ 143 million in 2020 although 180 million pieces were earlier projected to have been distributed during the year. The projected requirements of male condoms for the next 3 years are shown in the figure. According to the Ministry of Health, the country has enough stock of condoms in the pipeline to cover public sector condom needs with potential for increased quantities in case of need.



In regard to female condom use, the coverage level is much lower, partly due to inadequate knowledge and skills on correct use. The national projected target requirements for female condoms is assumed to be 1% of male condoms’ requirements.

In 2020, condom promotion and distribution was affected by the Covid-19 pandemic. The Condom Coordinator at the Ministry of Health

had this to say, “The Covid-19 shut down and the *“One Health Facility One Warehouse”* Policy affected the distribution, particularly for April, May and June until we got a waiver allowing IPs and CBOs to distribute to the users through community pick points”.

Programme effectiveness and impact

Condoms are effective in preventing the transmission of HIV infection and other sexually transmitted diseases (UNFPA, WHO and UNAIDS). In their joint position statement, UNFPA, WHO and UNAIDS states that “Male and female condoms are the only devices that both reduce the transmission of HIV and other STIs and prevent unintended pregnancy”, and that “Condoms have played a decisive role in HIV, STI and pregnancy prevention efforts in many countries”. In Uganda, declining trends in HIV infection has been partly attributed to condom promotion as part of the comprehensive HIV prevention strategy. Condom promotion as part of the social behaviour change communication (SBCC) has been effective in increasing awareness and knowledge of the value of condom use in preventing HIV transmission.

Moving forward

Investment should be made in condom promotion and distribution as a tool for triple protection against unwanted pregnancies, HIV infection and sexually transmitted infections.

- Use a people-centred approach to reach clients where or near where they live in line with the concept of last mile delivery, through bars, hotels, public toilets, etc.
- Continue targeted condom promotion and distribution with a focus on high-risk populations (PLHIV, KP/PPs, discordant couples) with demand creation strategies implemented.
- Awareness creation that to those on PrEP, to still use condoms to prevention transmission of STIs and having unwanted pregnancies for AGYW and other women.
- Address the challenge of having condoms being sold at commercial prices compared to the subsidized costs which were implemented in the past when service providers such as UHMG were funded to implement condom promotion and distribution services.
- Address the moral approach bottleneck which hampers Joint Medical Stores (JMS) from warehousing condoms.
- Address the low condom use during high risk sex.
- Implement strategies to address age, urban/rural and regional disparities in condom use.
- The strategic shifts proposed by the Ministry of Health to revamp condom programming

Ministry of Health.: National Comprehensive Condom Programming Strategy & Implementation Plan 2020 – 2025. September 2020.

Against the current challenges to condom use where condom use among women during last higher risk sex is low, condom use among sex workers is still sub-optimal (69%), condom use among men having sex with men is considerably lower compared to men in the general population, and low condom use among PLHIV, the new strategy proposes to increase condom use at last high risk sex among women and men aged 15-49 years to 75% by 2024. The strategy underscores that attainment of the set targets call for the following four strategic shifts:

- From single-issue approach to one comprehensive and coordinated programme.
- From commodity driven to people-centred and tailored approach.
- From business as usual to data driven and innovation.
- From donor driven to country and community owned.

are poised to lead to better outputs and outcomes (see the box below).

4.6 Social Behaviour Change Communication

Background and context

Social behaviour change communication, the strategic use of advocacy, communication and social mobilization to systematically facilitate and accelerate change in the underlying determinants of HIV risk, vulnerability and impact (NSSP 2020/21-2024/25) is a vital component of the prioritised package of interventions for this investment case framework for the decade. SBCC is cross-cutting to HIV programmes and has a central role in promoting HIV related risk avoidance behaviours and discouraging risk taking behaviours, and also vital in promoting adoption of good HIV related attitudes and uptake of HIV services.

Evidence base

The implementation of SBCC in the country dates back to the early stage of the HIV epidemic. The SBCC roll out has been supported by various government policies, strategies and guidelines. However, several HIV interventions have their standalone communication strategies, with no up to date single comprehensive communication strategy. A communication strategy is a coordinated and comprehensive plan for guiding multiple actions or activities that aim at achieving specific SBCC goals and objectives. The HSHASP provides for SBCC as one of the priority high impact interventions under the Fast Track to HIV epidemic control in Uganda. The 2020 Consolidated Guidelines for the Prevention of HIV/AIDS in Uganda provides guidance on BCC. Specifically, it states that “The priority of behavioral interventions is to delay sexual debut; reduce unsafe sex especially concurrent sexual partnerships, discourage cross-generational and transactional sex, and promote consistent condom use”. It advocates for use of evidence-based communication strategies.

Service delivery approaches

The national sexual behaviour change communication service delivery is being provided using multi-channel approaches. Specifically, the following communication channels are being implemented in the country: i) Interpersonal communication; ii) Community dialogue; iii) Interactive mass media programmes such as “OBULAMU” - this has taken on various themes and different languages to promote the uptake of HIV programmes; iv) innovative social media to reach targeted audiences; v) Client oriented approaches targeting special groups; includes BCC interventions that focus on youth; vi) Total market approach in promoting condoms; and, vii) Marking special days: World AIDS day, Philly Lutaaya and Candlelight Memorials.

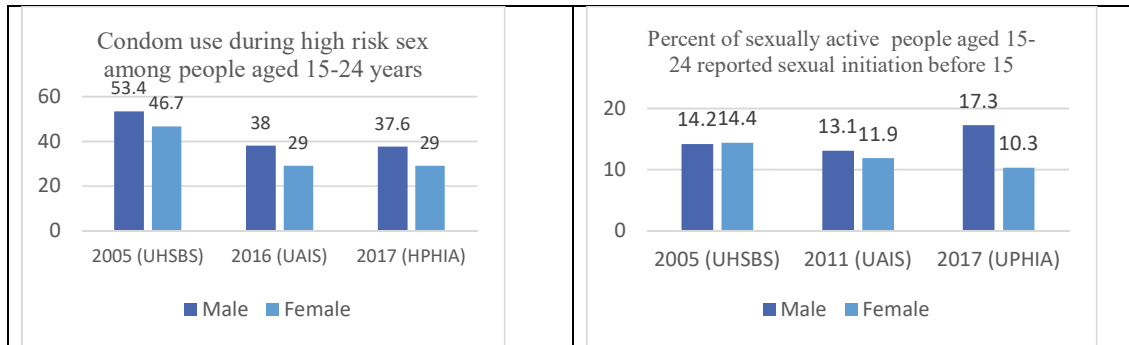
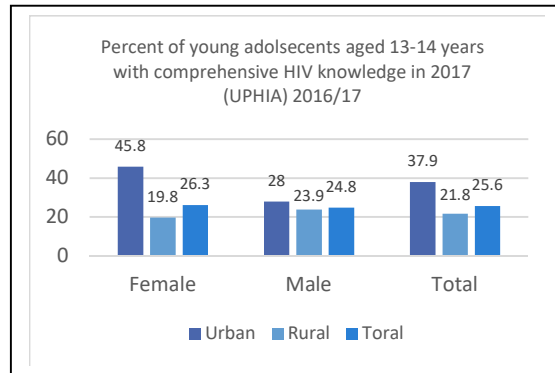
Programme coverage

The HSHASP target for Behaviour Change Communication is 50 percent of target population reached by 2023. To date, there has been suboptimal achievements on SBCC. It is reported that none of the behavioural change outcome targets set by the NSP 2015/16-2019/20 was achieved (JAR 2020). The possible explanation given for this finding include, “inadequate coverage of effective interventions, poor targeting of interventions, and new contextual challenges such as increasing urbanization, access to social and other media”.

One indicator for monitoring progress on SBCC is the proportion of young people age 15 – 24 years with comprehensive HIV knowledge. Overall in 2017, 24.8% of the boys and 26.3% of implying that just one quarter of young adolescents are knowledgeable about HIV. The above shows that fewer girls had sex before 15 years, from a baseline of 11.9% in 2011 to 10.3% in 2017. The NSP target was however 7% by 2020, hence, was not achieved.

Programme effectiveness and impact

Having good knowledge of HIV and related attitudes, as well as a set of life skills is a stepping stone for individuals and communities to take action to reduce their level of HIV risk or change their risky behaviours. Determination of effectiveness of SBCC can be adduced from progress towards the attainment of behaviour change goals, including; 1) Increase in condom use; 2) Increase in appropriate STI care-seeking behaviour; 3) Delay in sexual debut; and 4) Reduction in the number of sexual partners. Ultimately, the above will impact the trend in HIV infection. To date, data shows a mixed picture on sexual behaviours in in Uganda. Level or even declining trends in condom use during higher risk sex, increase in age as sexual debut for girls and reduction in reported number of sexual partners have been documented. Furthermore, the initial reported decline in HIV prevalence was mainly attributed to SBCC⁷⁷. Stigma among PLHIV has been reported to have reduced from 50% in 2013 to 24% in 2019. The above indicate that SBCC may to some extent been effective in Uganda.



Moving forward

Implementation of SBCC interventions remains relevant to promote sexual behaviour change, as well as uptake of the HIV care and treatment services. However, there are gaps in SBCC related indicators showing suboptimal levels of coverage. Additionally, some HIV intervention areas lack comprehensive communication guidelines. Therefore, strategies that enhance SBCC programme uptake should be implemented. To address the gap of lack of a comprehensive SBCC strategy, there is need for the development and operationalising of a comprehensive communication strategy for the public health HIV response that addresses the different HIV prevention interventions and target groups such as key and priority populations (adolescents and young people). Also, given that annually a big cohort of children and adolescents aged up into adolescents and young adults, respectively, young people should be targeted by SBCC. Young people need to acquire and maintain high HIV knowledge and good attitudes, as well as be empowered with skills to help them foster positive behaviour change. SBCC should include youth-focused interventions, interpersonal communication, community dialogue and interactive mass media programs that can influence safer and healthy lifestyles.

4.7 Pre-exposure Prophylaxis (PrEP)

⁷⁷ Asiimwe-Okiror G, Opio AA, Musinguzi J, Madraa E, Tembo G and Carael M. Changes in Sexual Behaviour and Decline in HIV Infection Among Young Pregnant Women in Urban Uganda. *AIDS*, 1997; 11:1757-1764.

Background and context

HIV serodiscordance has been reported globally and in Uganda. Serodiscordant couples play a role in maintaining the global HIV epidemic and HIV transmission within serodiscordant couples can contribute substantially to the overall burden of disease. During the 2004-05 UHSBS, of 4,000 cohabiting couples who were both tested for HIV, 5 percent were found discordant while in the 2011 UAIS, of 4,724 cohabiting couples who were both interviewed and tested for HIV, 6 percent were found discordant. In view of this, there is need for prevention of HIV transmission to the HIV negative partners who are in serodiscordant relationships.

Evidence base

There is a big body of evidence which shows that use of ARV pre-exposure provides protection against HIV transmission. Studies have demonstrated that antiretroviral therapy reduces the sexual transmission of HIV in HIV-serodiscordant couples by more than 96%^{78,79}. In support of use of HAART for PrEP, the World Health Organization has provided guidance for HAART introduction to all HIV infected patients remaining in serologically discordant relationships. In-country, the Ministry of Health has released the latest Technical Guidance on Pre-Exposure Prophylaxis (PrEP) for Persons at High Risk of HIV in Uganda in May 2020⁸⁰. Additionally, the Consolidated Guidelines for HIV Prevention issued by the Ministry of Health in February 2020 also provides for PrEP. Globally, the ARV drugs of choice for PrEP are Truvada (TDF/FTC), but in Uganda guidelines, use of cheaper drugs (TDF/3TC) is also recommended.

Service delivery approaches

In Uganda, a targeted approach of service delivery directed at high risk population groups is being used. Pre-Exposure Prophylaxis was adopted as a component of the combination HIV prevention package. In 2016, PrEP technical guidelines and tools were developed to guide the roll out and implementation of PrEP services. The guidelines have since updated. The new guidelines guide that PrEP should be differentiated into facility based and community based service delivery models. The facility based model services are to be provided at accredited ART sites where health workers have been trained. This also entails PrEP services being integrated within the broader sexual and reproductive health services. The community service delivery model will entail two approaches, namely; a peer led approach where peer leaders mobilize key populations for PrEP services in their hotspots; and the delivery of PrEP at community through the Drop in centres and the community PrEP Hub system.

Programme coverage

The roll out of PrEP started in July 2017 using a phased funded approach. By the end of 2019, 35 districts and ninety 90 sites were implementing PrEP across the country (JAR 2020). Overall, data from MoH show that in 2020, over 86,607 clients accessed PrEP services during the year. Utilization of services varies with sub-population sectors and gender, with more men than women accessing the services. Of 86,607 clients who accessed, the majority (49.4%) were sex workers, 13.3% were PLHIV in discordant relationship and 8% were clients of sex workers. The other reported beneficiaries of PrEP are men who have sex with men, fishing communities,

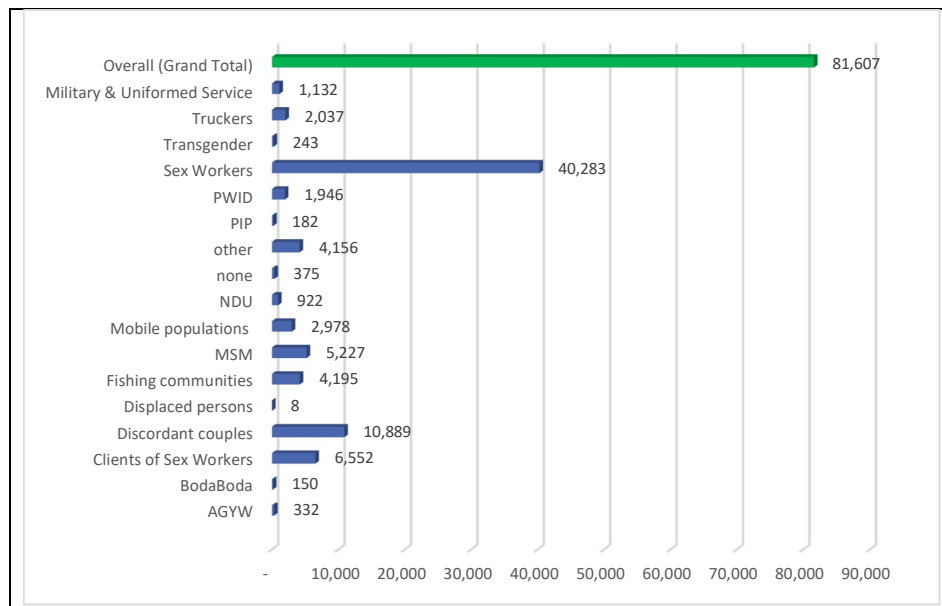
⁷⁸ Cohen MS, McCauley M and Gamble TR.: HIV treatment as prevention and HPTN 052. *Curr Opin HIV AIDS*. 2012 March; 7(2): 99–105. doi:10.1097/COH.0b013e32834f5cf2.

⁷⁹ Muessig KE and Cohen MS.: Advances in HIV Prevention for Serodiscordant Couples. *Curr HIV/AIDS Rep*. 2014 December; 11(4): 434–446. doi:10.1007/s11904-014-0225-9.

⁸⁰ World Health Organization. Guidance on pre-exposure oral prophylaxis (PrEP) for serodiscordant couples, men and transgender women who have sex with men at high risk of HIV: recommendations for use in the context of demonstration projects. Geneva, Switzerland: 2012. Available at: http://apps.who.int/iris/bitstream/10665/75188/1/9789241503884_eng.pdf

mobile populations, displaced populations, persons who inject and use drugs, military and uniformed persons, transgender people, truckers, bodaboda and truckers.

Figure: Cumulative Number Who Initiated PrEP in 2020 by sub-Population Type



At the initial phase of the introduction of PrEP in the country, implementation was slow. The services then were directed at individuals at substantial risk of acquiring HIV including discordant couples, sex workers, adolescent girls and young women, men who have sex with men and persons with disability. There was poor performance due to low demand, low uptake, poor adherence, myths and misconceptions, as well as stigma associated with use of ARVs. Some of these challenges persist up to now. Currently, the key bottlenecks and weaknesses being experienced by PrEP implementation are: 1) Inadequate number of trained health workers; 2) Poor retention of PrEP clients; and 3) Stigma due to dispensing PrEP medicines in containers similar to the general ART dispensing for HIV infected persons.

Programme effectiveness and impact

The outcomes for determination of cost and cost-effectiveness of PrEP are the number of HIV infections averted and the cost per new HIV infection averted, respectively. Currently, no data is available on the impact of PrEP in Uganda. Studies are required to elucidate this grey area.

Moving forward

As Uganda implements its roadmap to attain zero HIV by 2030, PrEP remains an important tool for HIV prevention among key and priority populations. Continued investment on the roll out of PrEP is therefore recommended. However, for PrEP to have more impact its coverage needs to be scaled up to more districts and facilities. Over three quarters of the districts remain without these services. To ensure quality services, accredit selected PrEP implementing sites. Also, the programme implementation challenges identified such as stigma should be addressed.

4.8 HIV epidemic control strategies for Adolescent Girls and Young Women

Background and context

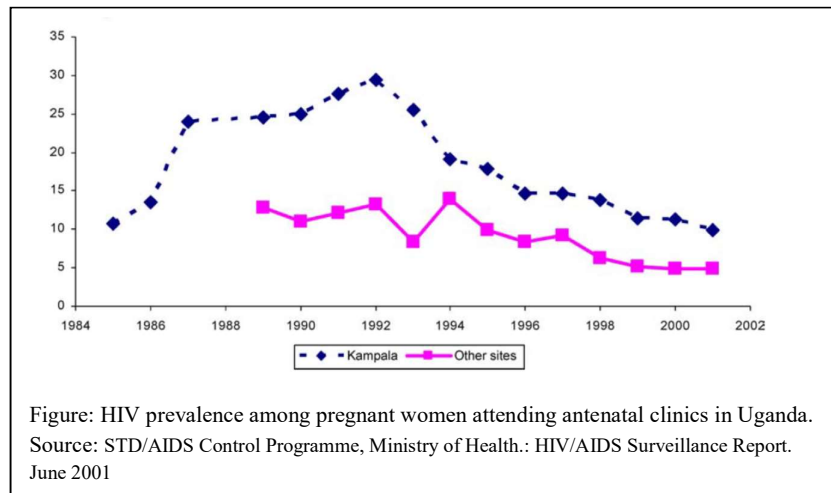
Adolescent girls and young women (AGYW) are a priority target group for HIV epidemic control because of their burden of HIV incidence. Epidemiological data presented earlier in this report shows that adolescent girls and young women currently suffer the highest HI incidence in the general population, Figure 3.3. UPHIA 2016-17 showed that among people aged 15-24, HIV prevalence was four times higher among females (3.3%) than in males (0.8%), highlighting the disproportionate HIV burden among AGYW compared to their male counterparts. In regard to sexual and gender based violence, the survey revealed that physical or sexual violence among intimate partners in the 12 months preceding the survey was reported by 11.0% of adolescent girls aged 15-19 years and young women aged 20-24 years. It was however noted that the reported figure could be an underestimate since the responses was from face-to-face interviews. These data underscore the need for continued prioritization of AGYW to access and receive HIV prevention services.

Evidence base

There is a good policy environment for services for AGYW; the implementation of HIV interventions that target AGYW is supported by the National Health Policy, the Health Sector Strategic & Investment Plan, the National HIV and AIDS Strategic Plan, the Health Sector HIV and AIDS Strategic Plan, the Reproductive Health Plan - the Sharpened Plan. In addition, historical data of the 1990s and early 2000s, show that information-education-communication (IEC) promoted HIV risk avoidance was shown to be effective. A wide range of sexual behaviour changes was reported including a 65% reduction in the number of sexual partners between 1989 and 1995 and an increase in condom use^{81,82,83,84}. Furthermore, the prevalence of HIV infection among pregnant women peaked in 1991 at 21.1% and by 2000 had declined to 6% nationally across 15 antenatal clinic sites with greater declines among younger age groups. Stoneburner et al referred to the above observed magnitude of decrease in the prevalence of HIV infection as “equivalent to a vaccine of 80% effectiveness”.

Service delivery approaches

In consideration of the magnitude of HIV infection among AGYW, programmes that aim at reduction of HIV incidence and target adolescent girls and young women have been implemented across districts in Uganda. Both targeted and integrated service delivery approaches are being employed to



⁸¹ Stoneburner RL and Low-Ber D. Population-level HIV declines and behaviour risk avoidance in Uganda. Science 2004 Apr 30; 304:714-8.

⁸² Daniel Low-Ber, Rand L. Stoneburner.: Behaviour and communication change in reducing HIV: Is Uganda unique? 2004.

⁸³ Green EC, Halperin DT, Nantulya V and Hogle JA.: Uganda’s HIV Prevention Success: The Role of Sexual Behavior Change and the National Response. AIDS and Behavior, Vol. 10, No. 4, July 2006. DOI: 10.1007/s10461-006-9073-y.

⁸⁴ Abdool Karim SS reviewing Stoneburner RL and Low-Ber D.: Risk Avoidance and Reductions in HIV Infection: A Success Story from Uganda. Science 2004.

reach AGYW with layered HIV prevention and care services. Health facility based services that benefit AGYW are being provided in addition, projects such as the Determined, Resilient, Empowered, AIDS Free, Mentored Safe (DREAMS) provide community services for AGYW in 61 districts. Globally, the DREAMS partnership is one of the largest efforts to provide adolescent girls and young women with a comprehensive, multisectoral package of services that addresses the multiple social, economic and structural drivers that fuel HIV risk. It is funded by the PEPFAR but other donors such as Global Fund, the UN system are also supporting similar services in the country. Furthermore, the AGYW related services are being provided in partnership with Ministry of Education and Sports (MoES) targeting in-school adolescents and young women; and supporting care and antiretroviral treatment for the in-school adolescents and young women with HIV. Ministry of Gender, Labour & Social Development (MoGLSD) has responsibilities in HIV prevention interventions for out-of-school adolescents and young women.

Programme coverage

Adolescents and young women in Uganda are being reached with layered comprehensive services, including SBCC, HIV testing and counselling, condom distribution and use and ART. The intended effects of social behaviour change communication programmes for AGYW is safer behaviours and increased service use achieved through improved communication, risk perception, HIV disclosure, reduced gender-based violence and changes in social and gender norms⁸⁵. Condom use among AGYW is an indication of safer sex negotiation.

For HIV testing, data show that in 2017 (UPHIA 2016-17), among females aged 15-24 years interviewed, 71.2% reported that they had ever tested for HIV and received their results; and 53.1% reported that they knew their HIV status. However, 60.0% of adolescent girls aged 15-19 years reported being unaware of their HIV status. On condom use, among sexually active women who reported having sex with a non-marital, non-cohabitating partner in the 12 months preceding the survey, only 28.3% reported using a condom the last time they had intercourse with such a partner. The same survey showed that the percentage of females aged 10-19 and 20-24 years were virologically suppressed were 51.4% and 42.2%, respectively. The VLS prevalence was however generally low (less than 50%) among the younger population under 24 years of age compared to the population aged 25 years and older.

Programme effectiveness and impact

An ambitious national target has been set to reduce HIV incidence by 40% in adolescents. As alluded to above, risk avoidance through condom use and reduction in casual sex have been reported among AGYW in Uganda. Furthermore, it has been reported that the DREAMS project has led to a 25% reduction of HIV incidence among AGYW in the programme districts. These show that the AGYW programme interventions are effective and having impact.

Moving forward

⁸⁵ UNAIDS Guidance 2016. HIV prevention among adolescent girls and young women. Putting HIV prevention among adolescent girls and young women on the Fast-Track and engaging men and boys.

Social behaviour change communication will continue to play a central role in the design and provision of AGYW HIV prevention services. The SBCC will be needed to promote HIV risk avoidance and promote uptake of the interventions. Furthermore, given the current sub-optimal levels of HIV programme coverage among AGYW, there is need to further scale up interventions. If the interventions are scaled up to high levels, HIV incidence among AGYW is expected to be reduced by about 80% compared to if the coverage levels are kept constant (2019 HIV Epidemiological Surveillance Report). The Ministry of Health has prioritized strengthening comprehensive HIV prevention interventions targeting adolescents and young people (HSHASP) and has clearly articulated activities for implementation. Optimization of the implementation of these activities will enhance progress towards the zero new HIV infection goal; the activities include:

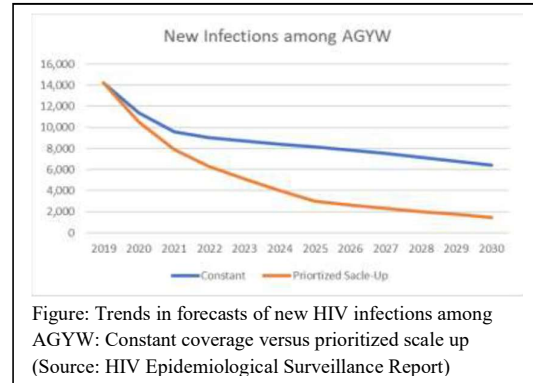


Figure: Trends in forecasts of new HIV infections among AGYW: Constant coverage versus prioritized scale up (Source: HIV Epidemiological Surveillance Report)

- Operationalising the communication strategy for adolescents and young people to influence adoption of safer sexual practices.
- Building the capacity of service providers to deliver integrated youth-friendly HIV, sexual and reproductive health services that include prevention of gender-based violence.
- Empowering adolescents and young people with life-skills and linking them to existing HIV prevention services.
- Improving testing services for young people with effective linkage and retention

Under MTCT, the HSHASP recommends focusing on pregnant and breastfeeding adolescent girls and young women (AGYW) 15 – 24 years; and specifically the following activities:

- Following up HIV testing for HIV negative pregnant and breastfeeding AGYW.
- Improving linkage to OVC services / socio-economic services and violence prevention. Adolescent friendly PMTCT services for HIV-positive AGYW to ensure improved ART uptake, adherence, retention and viral load suppression.
- Strengthen follow up of partners of AGYW through innovative approaches such as APN.

4.9 TB Preventive Therapy

Background and context

Comorbidity with HIV and Tuberculosis is very common in Uganda, see section 3.8.6. Due to this, Uganda adopted a policy to screen all HIV clients for TB and vice versa, in line with the recommendation of the World Health Organization. Adults and adolescents living with HIV who are unlikely to have active TB should be offered TB preventive therapy and that children who do not have poor weight gain, fever or current cough should be offered TB preventive therapy to reduce the risk of developing active TB, regardless of whether or not they are receiving antiretroviral therapy.

Evidence base

There was a lag in Uganda between the time when the evidence of the benefits and effectiveness of TB preventive therapy (TPT) became available and incorporating it into practice. Moreover, one of the first studies on isoniazid was done in Uganda. Years later on, policies and guidelines were developed to guide the roll out of the treatment in the country. The 2016 National Guidelines for Management of Common Conditions also elaborates guidance of TPT and adds that adjunct treatment with Vitamin B6 (pyridoxine) 25 mg per day; should be given

concomitantly with isoniazid for the duration of therapy, to prevent peripheral neuropathy. The 2016 consolidated guidelines for prevention and treatment of HIV in Uganda provides for TB preventive therapy. Specifically, for isoniazid preventive therapy (IPT), the guidelines recommend that INH should be given for six months to HIV exposed infants who are exposed to TB after excluding TB disease. Furthermore, for newborn infants, if the mother has TB disease and has been on anti-TB drugs for at least two weeks before delivery, INH prophylaxis should not be given. The eligibility for IPT include: 1) HIV-positive infants and children < 5 years with a history of TB contact and have no signs and symptoms of active TB disease; and 2) HIV-positive children (\geq one year of age), adolescents and adults with no signs and symptoms of TB. The 2020 guidelines say that “all PLHIV with a negative TB symptom screen should be evaluated for TPT eligibility and offered TPT if eligible” and that “TPT is currently NOT recommended for contacts of patients with MDR-TB”. Daily Rifampicin and Isoniazid for 3 months is recommended for children less than 15 years.

Service delivery approaches

Tuberculosis preventive therapy is provided in an integrated manner at the health facilities. Also, a targeted approach of service delivery using project mode. For example, the 100-Day Accelerated IPT Scale-Up Plan which was launched on July 3, 2019 to scale up IPT in Kampala⁸⁶. It aims to prevent TB among PLHIV by: 1) Enrolling 300,000 PLHIV on isoniazid preventive therapy (IPT); 2) Scaling up IPT initiation of children living with HIV and under-five TB contacts at 1,947 antiretroviral therapy sites; and 3) Ensuring 100 percent completion of IPT after 100 days, both for new and previously enrolled clients. The Defeat TB Project supported the initial activities to scale up IPT in Kampala, Wakiso and Mukono, as well as in USAID supported regions using a system strengthening and quality improvement approach.

In line with the targeted approach of service delivery, Isoniazid preventive treatment also applies to health workers and persons living in congregate settings such as prisons⁸⁷. Health care workers living with HIV are expected to be screened for isoniazid preventive therapy as part of the basic HIV care and treatment.

Programme coverage

One of the performance indicators for HIV care is the percent of people with diagnosed HIV infection on Isoniazid Preventive Therapy. Although the target for this indicator is 80%, it is reported that by June 2020, it was 51% up from 9% reported in 2019 (JAR 2020). Thus, the target has not been achieved. The improvement in 2019 was due to the 100-day IPT campaign.

Programme effectiveness and impact

Studies have shown that TPT is effective and impactful. Bell and colleague conducted a modelling study that considered three IPT regimens including daily INH for 6 months; and showed that IPT extends life expectancy and reduces the number of TB cases⁸⁸. Also, in a cohort study by Lugada et al, it was reported that Isoniazid therapy was 70% effective at preventing tuberculosis in HIV-infected, PPD-positive Ugandan adults. These investigators however observed that difficulties in excluding active tuberculosis and the costs of running the programme may limit

⁸⁶ Brief by the University Research Co., LLC on the “Launch of the Uganda 100–Day Accelerated Isoniazid Preventive Therapy Scale-Up Plan”. July 3 2019.

⁸⁷ Ministry of Health. Uganda National Guidelines for Tuberculosis Infection Control in Health Care Facilities, Congregate Settings and Households.

⁸⁸ Bell JC, Rose DN and Sacks HS.: Tuberculosis preventive therapy for HIV-infected people in sub-Saharan Africa is cost-effective. AIDS. 1999 Aug 20;13(12):1549-56. doi: 10.1097/00002030-199908200-00016.

its widespread implementation. However, no data is available to determine whether IPT implementation has had effects in TB prevention in Uganda. Given that programme coverage picked up in 2019, it is unlikely that IPT has had a significant impact in the country.

Moving forward

Given the high rate of HIV and Tuberculosis comorbidity in the country, IPT will remain relevant. But, for it to have the desired impact, efforts should be made to scale up its implementation to address the current sub-optimal coverage of 51%.

4.10 TB/HIV Collaborative Activities

Background and context

The need for collaboration between the HIV and TB service is rendered necessary by the burden of HIV and TB co-infection which is up to 50% of TB patients in Uganda are also co-infected with HIV. Secondly, both TB patients and HIV clients are seen from the same health facilities. Thus, an integrated approach would be more efficient. Thirdly, vertical approaches have proved to be costlier than integrated approach, leads to duplication and missed opportunities for HIV and TB care. Given the above, adoption of the ‘one-stop-centre’ model for TB/HIV care is necessary to facilitate provision of care for co-infected patients.

Evidence base

The implementation of TB/HIV collaborative activities in Uganda have been supported by a number of policies, strategies and guidelines. These include; the National Policy Guidelines for TB/HIV Collaborative Activities in Uganda of 2006 and 2013, and the National Tuberculosis and Leprosy Control Programme Revised National Strategic Plan 2015/16-2019/20. These are based on guidance from the WHO’s 2005 and 2012 Guidelines on TB/HIV Collaborative Activities.

Service delivery approaches

The National Coordination Committee for TB/HIV was launched in 2005 to coordinate the dual TB/HIV activities. The services are being provided in an integrated manner at health facility level. Screening for HIV among clients in TB clinics and screening for TB among TB patients is ongoing. The ‘one-stop-centre’ model for TB/HIV care is in practice.

Programme coverage

Some progress has been made; overtime, screening for TB among PLHIV rose from 27% in 2006 to ~ 92% in 2015⁸⁹. The proportion of TB patients who tested HIV positive was 41.5% in 2016 compared to 54% in 2010. Furthermore, the proportion of TB patients with a documented HIV test result increased from 68% in 2009 to 97% in 2016, and Cotrimoxazole Prophylaxis coverage among TB/HIV co-infected patients rose from 86% in 2007 to 98% in 2016. The ART coverage among TB/HIV co-infected patients increased from 22% in 2009 to 88% in 2016. Between 2018/18 and June 2020, there was a modest increase in TB Preventive Therapy coverage among PLHIV from 42% to 58% (JAR 2020). Additionally, the percentage of estimated HIV positive incident TB cases receiving both TB and HIV treatment increased from 60% in 2015 to 94% in March 2020; TB preventive treatment completion rose from 86.7% in 2015 to 72 % in 2019; and TB case detection rate rose from 48% during the 2017/18 to???

⁸⁹ Ministry of Health, NTLP. Revised National Strategic Plan 2015/16-2019/20.

Programme effectiveness and impact

The programme has had impact in the co-management of TB and HIV treatment. Improvement has been registered in TB case detection among people living with HIV and TB treatment among people living with HIV. The percentage of estimated HIV-positive incident TB cases that received treatment for both TB and HIV has also improved and has been increasing over time. Preventive therapy among TB/HIV co-infected persons has also taken root.

Moving forward

Since TB is a leading cause of morbidity and mortality among PLHIV, strategies that facilitate prompt TB treatment and early antiretroviral therapy are critical for reducing the mortality due to HIV-associated TB. Implementation of these strategies should remain. Investment should be made to enable continued routine screening for TB among PLHIV, INH prophylaxis among PLHIV and screening for HIV among all TB patients. As a minimum, the progress made so far as depicted in the figure below should be maintained.

4.11 Comprehensive Programmes for Key/Priority Populations

Background and context

Sex workers and Men who have sex with men (MSM), fisher folks have higher HIV incidence and prevalence compared to the general public (see section 3.5). More important, HIV prevalence among these key/priority groups is much higher than the general population⁹⁰. If unattended to, these groups can fuel HIV transmission in the population hampering progress in the fight against the HIV epidemic and slowing progress towards the achievement of national goals. The 2014 Modes of Transmission Study conducted in Uganda showed that FSW, their clients and their partners contributed 20% of new HIV infections; MSM and their female partners contributed 0.6% while people who inject drugs contributed 0.4%⁹¹. Also, the population size of key / priority populations is high⁹². In 2019, the estimated population sizes were: PWID (7,356), MSM (22,663), FSW (130,359) and FF (731,870). The above therefore underscore the need for aggressive programmes targeting key/priority populations.

In terms of HIV prevalence among PWIDs, the recent national size estimate for PWID indicate an upper bound of 11,034 (KPSE, Final Report October 2019). HIV prevalence remains almost three times higher in PWIDs and even more in women who inject drugs (17%-20%: 21% in males & 45% in females) according to CHAU/UHRN PWID situation analysis & rapid assessment study 2017 and UPHIA, 2017). Moreover, it has been reported that some PWIDs also belong to other key population categories, including, female sex workers (11.2%), fisher folk (6.4%), truckers (4%), and men who have sex with men (CHAU, 2017).

Evidence base

The policy environment for implementing services directed at key/priority populations has been a mixed bag. While support for services for the fisher folks has been good, it has not been smooth for FSM, MSM and PWID. The practice of sex work and men having sex with men is outlawed the Uganda Penal Code^{93,94}. Although the Uganda Anti Homosexuality Act was

⁹⁰ Opio A, Muyonga M and Mulumba N.: HIV/Serobehavioral survey among agricultural workers in the Lake Victoria Basin of Uganda. Plos One 2013; 8(8)e70770:1-10.

⁹¹ Uganda AIDS Commission. The Modes of Transmission Study. 2014.

⁹²UAC. Synthesis, Consolidation and Building Consensus on Key and Priority Population Size Estimation in Uganda. 2019.

⁹³ The Uganda Penal Code.

⁹⁴ The Uganda Anti Homosexuality Act.

nullified, the negative mindset created by it still lingers. It was however not until the mid-2000s that some supporting policies and guidelines were developed. Currently, the roll out of services is based on: 1) The NSP 2015/2016 - 2019/2020; 2) The HSHASP 2017/18-2022/23; 3) The 2020 Ministry of Health Consolidated Guidelines for prevention and treatment of HIV/AIDS.

Service delivery approaches

The services being implemented include HTS, ART, condom promotion and distribution, STI prevention and psychosocial support. Since 2014, the “test and treat” policy for HIV-infected KPs has been implemented in Uganda. The general HIV testing services with linkage to prevention, treatment and care is also benefitting key populations. The differentiated service delivery model targeting key populations implemented includes community-based/mobile outreach testing sites targeting key populations because they have limited access to HTS services. Door-to-door HIV testing targeting high HIV prevalence settings or communities with key populations (fisher folk or hotspots for sex workers). HIV self-testing is also a promoted for the key populations. Additionally, peer support structures providing services to the key populations. Furthermore, health workers have been given job-aids and tools to enable them provide psychological support to all categories of populations including key populations. Public private partnership is playing an important role in service delivery. For instance, Ministry of Agriculture, Animal Industries and Fisheries (MAAIF) leads delivery of services targeting the fisher folks as part of HIV/AIDS in the agriculture sector including fisheries.

Programme coverage

HTS, ART, condom promotion and distribution, STI prevention and psychosocial support services have been provided to key populations

For the fisher folks, because most of them live in the islands and along the shores of water bodies, poor road access and rough water current / terrain have undermined progress. Also, discrimination and violence against sex workers, men who have sex with men and persons who inject or use drugs pose additional challenges.

Key progress made during the 2019/20 financial year (JAR 2020)

- Coordination mechanisms for key populations programming were operationalized at national and district levels.
- The key populations’ size and profile estimate triangulation study was conducted.
- Under the PEPFAR CDC 10 million USD Key Population Investment Fund, grants were extended to 53 CDC supported districts to improve the capacity of the organizations of key populations.
- Tools and indicators for key population services were developed.
- Guidelines for key populations mapping and size estimation were developed and disseminated to the relevant implementing partners and stakeholders.

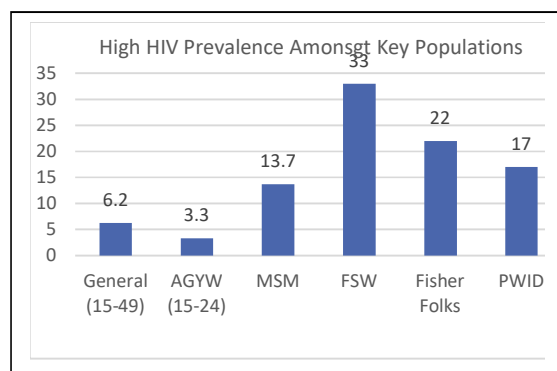
Programme effectiveness and impact

The indicators for measuring programme impact include: 1) The percentage of key and priority populations 15-49 years reporting consistent condom use; the NSP target for this indicator is 85%; 2) The percentage of key and priority populations who have received an HIV test in the previous 12 months and know their results; the NSP target is 90%. Currently, there is no nationally representative data on these indicators. However, some progress has been made on system strengthening. The mapping of key populations and the size estimation of the key populations has led to improvement in the evidence-based planning of services. Client centred service deliver approaches usually have better yield.

Way forward in the next 10 years

Given the high HIV incidence among the key/priority populations, there is need for continued investment in combination HIV prevention services targeting the group. Services targeting key populations should be scaled up to meet the national targets and should be provided using the targeted and differentiated service delivery model that incorporate the specific needs of the community members within their locations. There has also been recent introduction of harm reduction programs for people who inject drugs through a pilot facility set up in Butabika. Furthermore, a Comprehensive Communication Strategy for Key/Priority Populations should be developed to facilitate the roll out of the public health HIV response for these groups. Also, data is needed to be used for measuring progress in the implementation of programmes for the key populations. Therefore, steps should be taken to collect the relevant data.

Data shows a high burden of HIV among KPs (Hladik et al 2012, 2017, Opio et al 2013, and Uganda Harm Reduction Network 2016). Programmes targeting these populations should be comprehensive. Specifically, the following are recommended: i) Key populations should have access without discrimination to combination HIV prevention services⁹⁵ comprised of condoms, ART, PrEP, PEP, STI screening and STI treatment; ii) Key populations who are living with HIV should access similar services as being received by other PLHIV, for instance, pregnant FSW should access



PMTCT services; iii) Services should address the structural, legal and policy barriers that hamper KPs from freely accessing HIV services. The barriers amongst others include homophobia, stigma, discrimination and violence against KPs⁹⁶. Articles 145-147 of the Penal Code Act 1950 outlaws and are prohibitive to KPs and steps should be taken to amend them. The Anti-Homosexuality Act, 2014 is an Act to prohibit any form of sexual relations between persons of the same sex. Although on August 14, 2014, the Uganda's Constitutional Court annulled the Act, there is still fear amongst KPs that it may be reactivated.

In the case of PWIDs, the following comprehensive measures are recommended: i) Increasing investment for harm reduction services; ii) Accelerating access to harm reduction services (HIV Prevention, Treatment and Care) for people who use alcohol, drugs and other substances, including; needle and syringe programme, Medically Assisted Therapy and overdose management services; iii) Addressing barriers that impede PWID from accessing health care services. The Narcotic Drugs and Psychotropic Substances Control Act (NDPSA) criminalizes all forms of narcotics and psychotropic substances and does not provide for harm reduction

The HIV epidemiological data shows great disparities in HIV service coverage between certain population sectors. These include the KPs/PPs; where the coverage of HIV services are lower than the general population. Bold steps should be taken to address the disparities and remove the bottlenecks. The steps include: i) Repeal of prohibitive laws that affect FSWs and MSMs. The Penal Code criminalizes sex work. One of the objectives of NSP 2020/21-2024/25 is to “Strengthen the legal and policy framework on HIV/AIDS to ensure that it is inclusive of all PLHIV, PWDs, KP/PP and other vulnerable groups”. It prioritizes advocacy initiatives to revisit

⁹⁵ World Health Organization.: Consolidated guidelines on HIV prevention, diagnosis, treatment and care for key populations. 2016 update.

⁹⁶ King R, Sebyala Z, Ogwal M, et al. How men who have sex with men experience HIV health services in Kampala, Uganda. *BMJ Global Health* 2020;5:e001901. doi:10.1136/bmjgh-2019-001901.

or repeal laws promoting mandatory HIV disclosure to make all health facilities free of stigma and discrimination; ii) Remove barriers to service provision - in the 2019/20 financial year, it was reported that the office of the Director of Public Prosecution launched the ‘Human based approach to remove barriers to uptake of HIV services in the criminal justice system’ (JAR 2020); iii) Establish services and interventions that reach the priority groups in their locations and communities. For instance, MSM networks can be engaged to promote linkage to prevention, care and treatment services. Furthermore, peer distribution of HIV self-testing kits in MSM networks may increase access to HIV testing⁹⁷; iii) Deliberate allocation of resources specially to address geographic areas where HIV incidence is high. In a modelling study⁹⁸, it was observed that “while treatment programs are needed everywhere there are PLHIV, prevention programs will be more cost-effective in the high incidence districts”. Incidence was 1% or more in 20 districts; thus, suggesting the need for location/geographic consideration in resource allocations. In another 23 districts have incidence between 0.8% and 1.0%; and that those 43 high incidence districts accounted for 26% of all new infections. The investigators suggested that it may be more cost-effective to first scale up in these districts.

4.12 Integration of HIV prevention and non-communicable disease Management

There is increasing comorbidity between HIV infection and some non-communicable diseases (NCDs) such as diabetes mellitus, hypertensive diseases and some types of cancers especially as they HIV treatment programme matures and older PLHIV are increasingly dominating. Due to this, effective strategies should also be implemented to address the related NCDs. Integrated service delivery models that use multi-disease strategies have been found beneficial in increasing the uptake of HIV testing services while addressing the co-morbidity of HIV infection and non-communicable diseases (NCDs)^{99, 100}. The co-morbidities among others

SEARCH Project

“Although several modalities for non-facility based testing have been successfully implemented in rural Africa, including home-based testing (HBT) and mobile testing vans, CHCs offer the advantages of acting as a platform for multidisease testing and rapid scale-up to population coverage in a period of days”.

include diabetes mellitus and systemic hypertension. The SEARCH project in SW Uganda and Western Kenya demonstrated that use of multi-disease service delivery model was cost-effective. The community health campaign combined HIV testing with screening for TB symptoms, malaria, diabetes and hypertension, as well as provision of treatment for malaria, de-worming for children aged 1-5 years and linkage to care for people diagnosed with HIV, TB, diabetes or hypertension¹⁰¹. Everyone received condoms and insecticide-treated nets. Based on its findings, SEARCH asserted that although several modalities for non-facility based

⁹⁷ Okoboi S, Lazarus O, Castelnovo B, Nanfuka M, Kambugu A, Mujugira A, et al. (2020) Peer distribution of HIV self-test kits to men who have sex with men to identify undiagnosed HIV infection in Uganda: A pilot study. PLoS ONE 15(1): e0227741. <https://doi.org/10.1371/journal.pone.0227741>.

⁹⁸ Avenir Health.: Modeling Analysis for the Uganda National HIV/AIDS Strategic Plan: Initial Results. 19 March 2020.

⁹⁹ Chamie G, Kwarisiima D, Clark TD, Kabami J, Jain V, et al. (2012) Leveraging rapid community-based HIV testing campaigns for non-communicable diseases in rural Uganda. PLoS ONE 7: e43400.

¹⁰⁰ Lugada E, Millar D, Haskew J, Grabowsky M, Garg N, et al. (2010) Rapid Implementation of an Integrated Large-Scale HIV Counseling and Testing, Malaria, and Diarrhea Prevention Campaign in Rural Kenya. PLoS ONE 5:e12435.

¹⁰¹ Alcom K.: Multi-disease prevention campaigns (part 2): case studies from Kenya and Uganda. November 2013. <https://www.aidsmap.com/news/nov-2013/multi-disease-prevention-campaigns-part-2-case-studies-kenya-and-uganda>. Accessed on February 25, 2021.

testing have been successful in rural Africa, including home-based testing (HBT) and mobile testing community health campaigns offer the advantages of acting as a platform for multidisease period of days¹⁰². Therefore, in the next decade, Uganda should invest in the implementation of multidisease approaches in order to enhance attainment of universal health coverage.

4.13 Structural Interventions / Programme Enablers

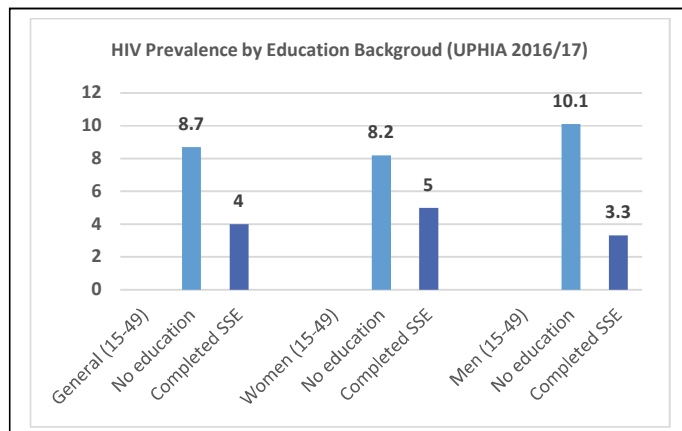
In line with partnership, the HSHASP 2017/18-2022/23 clearly spelt out the roles of four key line Ministries in programme implementation. The Ministries are; (i) Gender, Labour and Social Development, (ii) Ministry of Education and Sports, (iii) Ministry of Internal Affairs, and (iv) Ministry of Defence. These entities implement the following priority activities:

- Economic empowerment, psycho-social care and support.
- Engagement of out-of-school children, adolescents and young people in HIV prevention.
- HIV prevention services targeting in-school children, adolescents and young people.
- Supporting care and antiretroviral treatment for the in-school children, adolescents and young people living with HIV.
- HIV prevention interventions targeting the uniformed personnel and their families.
- Care and treatment for uniformed personnel and their families living with HIV.

4.13.1 Access to education

The role of school education in HIV prevention and uptake of health services has been well documented. Education reduces the social and economic vulnerabilities that often make girls and women more prone to HIV infection, and promotes gender equality and women empowerment. Girls enrolled in schools tend to marry later than their counterparts who are out of school¹⁰³. More educated people have better health seeking behaviours, and uptake of HIV prevention services. On the other hand, lack of education is associated with higher HIV transmission in most settings.

The UPHIA 2016/17 reported that among adults, HIV prevalence was highest among those with no formal education and declined with educational attainment. In recognition of the above, Uganda has taken deliberate efforts to enhance enrolment of children in schools and retention of young girls in schools. Over the last decade and half under the leadership of MoES, the country has been implementing universal primary education (UPE) and universal secondary education (USE) strategies¹⁰⁴ that have led to more equitable enrolment of children in schools. In addition, sexual education



¹⁰² Behrman JA.: The effect of increased primary schooling on adult women's HIV status in Malawi and Uganda: Universal Primary Education as a natural experiment. *Social Science & Medicine* 127 (2015) 108e115.

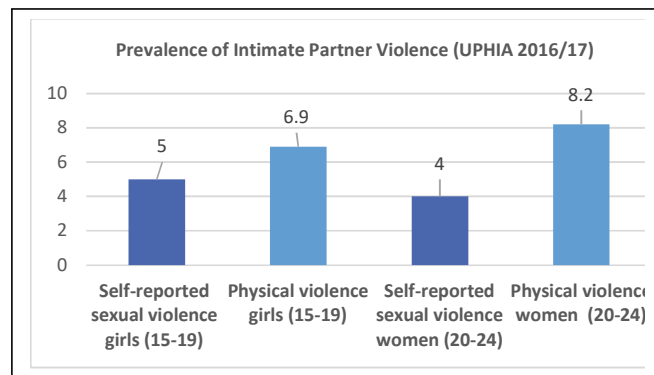
¹⁰³ Behrman JA.: The effect of increased primary schooling on adult women's HIV status in Malawi and Uganda: Universal Primary Education as a natural experiment. *Social Science & Medicine* 127 (2015) 108e115.

¹⁰⁴ Ministry of Education and Sports. The Education and Sports Sector Annual Performance Report (FY 2019/20).

programmes targeting both in-school and out-of-school youth have been implemented to enhance their HIV awareness and HIV comprehensive knowledge and behaviour change.

4.13.2 Gender Based Violence

Globally, gender inequality and sexual violence place women at higher risk of HIV infection. Harmful gender norms and inequality limit women’s human rights; thus, negatively affect access to health services in general and HIV services in particular. Transactional sex such as coerced sex in exchange for money, employment and food, and forced sex in marriage have been reported to be associated with a lack of condom use and increased risk of HIV transmission. These practices have reported among young women in Uganda. The UPHIA 2016/17 reported on the prevalence of intimate partner violence (IPV). The survey found that among ever-married or partnered older AGYW 7.8% reported experiencing physical violence, 4.2% reported experiencing sexual violence, and 11.1% reported experiencing either form of IPV in the 12 months preceding the survey. Poverty among women is another social determinant of health that leads to vulnerability to HIV.



In moving forward with the national response, there is need to invest in measures that enhance gender empowerment and human rights of women. The measures to consider include economic empowerment of women through cash transfer programmes; provision of support to finance income generating activities, and exploration of how women can benefit in national economic empowerment programmes such as “Operation Wealth Creation”. Furthermore, efforts are needed to address gender norms that promote intimate partner violence among older adolescent girls and young women, and to ensure that support services and clinical services are available to victims of IPV.

4.14 System Strengthening

Context

Since 1992 when the Uganda AIDS Commission came into being by an Act of Parliament, it has been leading the national multisectoral response to the HIV/AIDS epidemic. Over the years, the “Three Ones” UNAIDS principle of, One Coordination Mechanism, One plan, and One Monitoring System has guided work of the different partners. National HIV and AIDS multisectoral plans have been jointly developed and implemented. Joint reporting has been made and Joint Annual AIDS Reviews have been conducted. The JARs have highlighted strengths in the national systems, but also some weaknesses.

Progress

Coordination structures have been established at the national, district and community levels to enhance governance and leadership for the national response. At national level, the UAC Board, Country Coordinating Mechanism (CCM), Sectoral Technical Committees, Fora for Aid Development Partners (ADPs), organizations of communities of PLHIV. At district level, about 50% of districts have functional District AIDS Committees (DACs). Ninety-seven percent (97%) of the districts have established networks/forums of PLHIV.

For a coordinated reporting, the following have been attained:

- The HIV and AIDS E-mapping and Monitoring System to continuously map the activities of HIV and AIDS stakeholders has been established.
- The NADIC for managing HIV and AIDS data resources has been set up.
- A Situation room is in place to harmonize the sector data bases.
- A gender tracking dashboard for the NSP indicators has been established.

The other achievements that have been registered are:

- Policies, guidelines, protocols and standards for HIV services have been developed to guide programme implementation.
- Human resource developed through training in various technical areas. In addition, personnel from implementing partner organizations are providing technical support especially at district level.
- Surveillance systems for HIV have been established at national and sub-national levels.
- A national laboratory hub system for sample transportation has been established.
- A harmonized national health management information system has been put in place.
- Quality management and improvement systems have been established.
- Supply chain of HIV prevention and treatment commodities have been streamlined.
- Communities of PLHIV are being involved.
- Innovative service delivery approaches are being rolled out; including the differentiated HIV service delivery model.

On financing, some steps are being taken to increase domestic funding of the HIV programmes. The AIDS Trust Fund has been established, though has not yet been implemented. The Ministry of Finance Planning and Economic Development has instructed all accounting officers in the MDAs to allocate 0.1% of their annual budget for mainstreaming HIV and AIDS, gender equity planning and budgeting.

The current plan

Under the NSP 2020/21-2024/25, systems strengthening includes governance, infrastructure, human resource, financing/resource mobilization, monitoring, evaluation and research. Two objectives have been set: 1) To strengthen the multi-sectoral HIV and AIDS service delivery and coordination system that ensures sustainable access to efficient and quality services for all targeted populations; and 2) To strengthen the national HIV and AIDS strategic information management system for improved effectiveness and efficiency. The targets and outcome measures for system strengthening are:

- Structures for governance and leadership of the multi-sectoral response at all levels function at 100%;
- Human resources for delivery of quality HIV/AIDS services attain 70% minimum standards;
- Health infrastructure responsive to HIV service needs functions at 100%;
- Community systems to support groups strengthened; and
- Resources for HIV and AIDS are mobilized and efficiently utilized.

Moving forward

The NSP has elaborated a very comprehensive plan for system strengthening. The prioritized activities should be supported. Also, given the experience of Covid-19 pandemic on the HIV programme, there is need to invest in the establishment of resilient and sustainable systems for health that can stand the test of unplanned emergencies. The weaknesses in the health system

including inadequate domestic financing; inadequate equipment maintenance, quality control and quality assurance; insufficient numbers of skilled human resources; insecurity of commodities for HIV programmes and the associated stock-outs; as well as lack of a unique identifier in the health system that leads to duplication in counting of clients should be addressed. District and community level systems should be strengthened. In its statement, the Association of District Health Officers notes that “There is a policy and practice disconnect at the implementation level. The government policy emphasizes health promotion and disease prevention. Allocative decisions are in favour of curative and clinical services. We recommend: A good balance between health promotion, disease prevention, curative services and health systems strengthening in PEPFAR support¹⁰⁵”. The Association of DHOs also recommended that support should be provided for district led programming of health services in order to achieve Universal Health Coverage.

4.15 HIV Implementation Research Priorities

Evidence based practice

Over the last three decades, a lot of research has been conducted on HIV both locally in the country and at international level. Uganda has been home to some landmark studies, including clinical trials of the effects of nevirapine on mother to child transmission of HIV, medical male circumcision on HIV transmission among circumcised men; isoniazid prophylaxis on TB prevention, fluconazole prophylaxis among HIV infected individuals; and Cotrimoxazole prophylaxis among HIV infected individuals.

Uganda has a policy of evidence based policy formulation and planning. While evidence from many studies have been used to inform policy formulation and programming in the country, at times there were long lag between the time when evidence became available and its uptake. That is, the process of translation of research evidence to policy and practice has been slow, this gap needs to be addressed to have improved uptake of research evidence.

Gaps in research

The flurry of HIV research that have been conducted have been on HIV epidemiology, HIV prevention and care across the continuum. These have generated a lot of evidence. Never-the-less, gaps still exist requiring more studies. This is more so given that HIV programming is dynamic with ever changing contextual issues. More research is needed in the following areas:

- Implementation science to evaluate how known and proven cost-effective HIV interventions can be delivered better and be more effective.
- Psychosocial and family support strategies to improve individual and programme outcomes
- Strategies or interventions to reduce stigma and discrimination of PLHIV and their families.
- Research on the behavioural aspects of HIV.
- Research to understand the current drivers of the epidemic within the context of heterogeneous HIV epidemic.
- The role and acceptability of long-term ART.
- Cost-effectiveness of different service delivery options in the Ugandan context; including the evaluation of the cost and cost-effectiveness of DSD models.
- What aspect of the HIV cure agenda can be led by developing countries?
- HIV vaccine development.

¹⁰⁵ Dr. Ivan Kanya (Chairman).: Statement from the District Health Officers of Uganda to PEPFAR National Coordinator and Advisor – 02//09/2019. Presented by Chairman /Association of DHOs of Uganda.

- HIV treatment options; research to find drugs that have minimal side effects.
- Co-morbidity and HIV, HIV and ageing.
- HIV and COVID.
- Research on improving testing, care and prevention for HIV high risk groups.
- Research on integrating NCDs into HIV care.
- Understanding whether there are new modes of HIV transmission.
- Understanding vulnerabilities to HIV infection; what have not yet been addressed.
- Interventions to ensure timely linkage between HIV diagnosis, treatment and care.
- Evaluating the effectiveness of digital technology in HIV services delivery.
- Collection of and optimization of use of granular data to focus interventions.

Finally, it has been observed that there is no national research agenda for HIV. Therefore, in going forward, a national research agenda should be developed to guide HIV research and act as a tool for resource mobilization and allocation to HIV research.

4.16 Disruption of HIV services delivery in by Covid-19 pandemic

4.16.1 Background and context

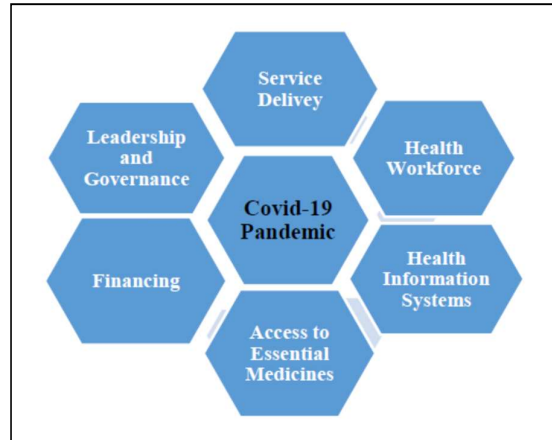
Since the break out of the Covid-19 pandemic in sub-Saharan Africa, concerns were raised on the potential impact of COVID-19 on HIV services in the region that is home to over two-thirds of ~38 million PLHIV in 2018. To understand the potential impacts better, a number of modelling studies were conducted. One study estimated the potential effect of prolonged disruptions to HIV prevention, testing, and treatment services on HIV-related deaths and new infections¹⁰⁶. The study showed that prolonged interruption of supply of ARVs would lead to excess mortality due to interruption of ART and increase in MTCT especially among poorer communities. Interruption to condom supplies and peer education were predicted to put people at higher risk of HIV transmission. However, physical distancing measures was predicted to reduce risky sexual behaviour. Based on the above findings, it was recommended that focus on maintaining uninterrupted supply of ARVs for PLHIV on ART to avoid mortality. Another modelling study examined the impact of disruptions on HIV outcomes in four countries, namely; South Africa, Malawi, Zimbabwe, and Uganda¹⁰⁷. The potential HIV deaths were compared with those that may be caused by Covid-19 in the same settings. The most important determinant of HIV-related mortality was an interruption to ART supply. The study concluded that HIV deaths could increase substantially during the Covid-19 pandemic and recommended that ensuring continuity of ART during the pandemic should be a priority.

In this analysis, we provide information on how Covid-19 affected HIV services in Uganda. Information was derived from documents reviews, published papers and the key informant interviews, as well as anecdotal reports. The information is presented in six thematic areas

¹⁰⁶ Jewell BL, Mudimu E, Stover J, ten Brink D, Phillips AN, et al.: Potential effects of disruption to HIV programmes in sub-Saharan Africa caused by COVID-19: results from multiple mathematical models. www.thelancet.com/hiv Vol 7. September 2020.

¹⁰⁷ Jewell BL, Smith JA and Hallett TB.: Understanding the impact of interruptions to HIV services during the COVID-19 pandemic: A modelling study. <https://www.journals.elsevier.com/eclinicalmedicine>. July 2020.

defined in line with the six building blocks of the health system (see box). A health system refers to all the organizations, institutions, resources, and people whose primary purpose is to improve health. It is the means to deliver effective and affordable care and to achieve increased health equity, especially for the poor. This analysis places Covid-19 pandemic at the centre of the health system. In July 2020, UNCST issued guidelines whose purpose was to streamline conduct of research during the COVID-19 pandemic¹⁰⁸. The guidelines amongst other things proposed that research should be done to assess the impact of COVID-19 on the health system:



and the economic impact of COVID-19 on the health system and economic effect on health workers Infection control measures to minimize infection.

4.16.2 Service delivery

The delivery of HIV services takes different forms; including, health facility level, community level, and home-based. The services can be extended face to face or online through devices such mobile phones and virtually through telephone or zoom consultations (telemedicine). In Uganda, most of the services are provided face to face. Taking the above into consideration, this analysis examined how the health service delivery was affected by the Covid-19 pandemic.

Cognizant of the potential impact of Covid-19 on HIV services, the Ministry of Health issued guidance¹⁰⁹ on maintaining critical HIV prevention, care and treatment services during the Covid-19 pandemic to reduce vulnerability of PLHIV to Covid-19, ensure continuity of ART and accelerated decongestion of health facilities to minimize transmission of Covid-19. Health facilities were guided to use telephone calls, SMS, social media platforms to communicate to clients and other stakeholders on services availability, follow up, adherence support and clinic attendance. Due to the social distancing and crowd limitation requirements of the standard operating procedures (SOPs)

Factors that affected access to health facilities and service provision

- Lock down
- Curfew restriction
- Travel restrictions
- Ban of public transport
- Social distancing requirements discouraging people congregating
- Fear of getting Covid-19 from the health facilities
- Temporary closure of health facilities due to health workers' infection
- Shift of emphasis to Covid-19 with less attention to other health services
- Temporary suspension of some HIV services

for Covid-19 control, the guidance gave directives to suspend a number of services that were deemed unsafe to provide, including HTS outreaches, SMC camps, peer services and AGYW spaces. The Covid-19 SOPs introduced among others, lockdown, curfew, travel restrictions involving a ban on public transportation. These measures led to travel difficulties, hence, some patients were unable to access health facilities during this period. As a result, some patients were unable to access health facilities due to fear and perceived high risk of contracting Covid-19 from health facilities. Lack of transport money by some patients also affected access to health facilities. The curfew imposed during the initial months restricted work times and travel.

¹⁰⁸ Uganda National Council for Science and Technology. National Guidelines for Conduct of Research During Coronavirus Disease 2019 (COVID-19) Pandemic. July 2020.

¹⁰⁹ Uganda Ministry of health Covid-19 Infection Prevention and Control Guidance for HIV Services Delivery.

Social distancing requirements could not allow provision of services that people congregating such as community level interventions. Some facilities were temporarily closed due to health workers' infection. Also, due to the Covid-19 pandemic, there were some shift of emphasis of service delivery to Covid-19 with less attention to other health services.

Service provision was negatively affected by Covid-19. A reduction in initiation of HIV exposed infants on ARVs was observed. A study in Busoga sub-region by Makerere University School of Public Health involving a retrospective analysis of data comparing the period Mar-Aug 2019 and Mar-Aug 2020 showed that the highest reduction in the proportion of HIE receiving ARVs was registered in Iganga (-33%), Jinja (-31%), Mayuge (-28%) and Kaliro (-27%) districts¹¹⁰. Another study reported that there was limitation on the accessibility to medical services¹¹¹. These investigators reported that use of technology was adopted as a mitigation measure to address the gaps in access; and remarked that "limitation in access gave prominence and unprecedented rise in the use of digital health technologies to deliver health information and services at a distance (telehealth) during the Covid-19 outbreak". The use of telehealth modalities including tele-consultation, tele-psychiatry, call centres and mobile phone health information dissemination increased. Whether these alternative approaches are effective, more research is needed on their efficacy and impact on clinical outcomes.

Additional information on the impact of Covid-19 on HIV services comes from assessments that focused on communities of PLHIV. One study was by the International community of women living with HIV and AIDS East Africa (ICWEA); the survey revealed that some PLHIV failed to pick their drug refills with respondents saying that the main challenge in getting ART was mainly fear of exposure to coronavirus and fear of stigma and discrimination¹¹². The survey further revealed delays or disruption in access to the sexual reproductive health services, with access to contraceptives and STI diagnosis and treatment being most affected.

From June-July 2020, NAFOPHANU assessed the extent to which Covid-19 impacted HIV service delivery and how individuals, families, communities, institutions were coping with the impacts¹¹³. Six hundred thirty (630) participants most whom were members of NAFOPHANU umbrella network of PLHIV from 101 districts were interviewed. The assessment revealed that; 1) 53% of participants had one month's or less of ARV supply left and 46% had two or more months' supplies left; 2) 21% of participants had attempted to get ARV refills in the past week; 3) 74% of respondents who had attempted to get ARV refills in the past week were successful while the remaining 26% got a partial or no refill; and 4) 54% of respondents who received ARVs got 3 months' supplies, but 32% received only one month's supplies; and 5) 482 respondents reported facing challenges in accessing ART due to Covid-19. The major challenges included long travel distance, lack of transport and fear of exposure to Coronavirus.

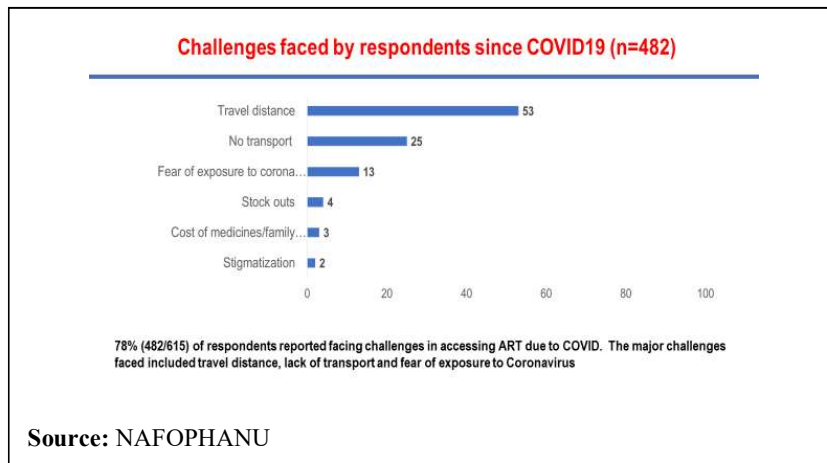
¹¹⁰ Makerere University School of Public Health. Report on the impact of COVID-19 containment measures on RMNCAH, HIV service delivery and utilization in Busoga sub region in Uganda. 2020.

¹¹¹ Kamulegeya LH, Bwanika JM, Musinguzi D and Bakibinga B.: The Pan African Medical Journal. 2020;35 (Supp 2):43.

¹¹² International community of women living with HIV and AIDS East Africa (ICWEA).: Report on the Survey of Experiences of Women Living with HIV during Covid-19. May-June 2020.

¹¹³ NAFOPHANU. Report of a Rapid Assessment of PLHIV: Round 2, Conducted July 2020. September, 03, 2020.

HIV prevention services for adolescent girls and young women (AGYW) were also affected.



One organization reported that programme performance between January and June 2020 was significantly affected by restrictions in response to the Covid-19 pandemic. The ban on social gatherings and restricted movements affected implementation of

AGYW activities, including; dialogues, outreaches and training. Due to this, US\$ 659,223 meant for music and drama competition for schools, school health conferences and regional consensus meetings to orient local government stakeholders could not be spent.

At the global level, the Global Fund noted that “we are seeing significant disruption to prevention programs, which often depend on community and face-to-face interventions rendered impossible during lockdowns. Similarly, access to lifesaving antiretrovirals has been made more difficult for by restrictions on movement, local stock outs, and in some cases, increased stigma and discrimination”¹¹⁴. The Global Fund reported that an online survey conducted in June 2020 by Local Fund Agents from a total of 106 countries revealed widespread disruptions to HIV, TB and malaria GF supported work as a result of the Covid-19 pandemic. HIV and TB laboratory services experienced acute pressure, 20% got high levels of disruption, with many of the advanced diagnostics instruments put in place to perform viral load testing for ART clients or to diagnose TB were being used for testing for Covid-19.

The above observations are consistent with the report of WHO¹¹⁵ survey, that reported HIV service disruption by Covid-19 pandemic due to stock out of drugs leading to disruption of ART services, lack of access to health facilities during lock down and diversion of health system capacities. The services disrupted included; HIV testing, HIV viral load monitoring, key population services, VMMC services, condom provision, STI services, enrolment on ARVs, eMTCT and EID services, pre-exposure prophylaxis services and Hepatitis B testing.

There were some benefits, e.g. some infrastructure that traditionally offer HIV services took on board Covid-19 work. For example, the Core laboratory of the Infectious Diseases Institute whose main domain is HIV laboratory work took on SARS-COV2 testing. A total of 36, 050 SARS-COV-2 samples were tested by the laboratory from August 2020 to Jan 2021. This shows the contribution of a HIV infrastructure in the control of Covid-19 pandemic, supporting the integrated approach of system strengthening that can benefit multi-diseases programmes.

¹¹⁴ The Global Fund.: Mitigating the Impact of COVID-19 on Countries Affected by HIV, Tuberculosis and Malaria. June 2020.

¹¹⁵ WHO HIV/HEP/STI COVID-19 Questionnaire

4.16.3 Health workforce

Health workers are central to health service delivery. Globally, a big number of health workers got infected by Covid-19 leading to deaths. The first case of Covid-19 in Uganda was reported on the 21st March 2020. By the 2nd January 2021, the cumulative total number of people infected in Uganda was 35,922 from 135 of the 136 districts¹¹⁶. Of these, 1,812 (5.0%) were health workers. In just a period of 2 weeks between December 13-27, 2020, one hundred and twenty seven (127) health workers from 21 districts became infected. Some of the affected

How health worker's performance was affected by Covid-19

- Health workers getting infected
- Quarantine of contacts of infected health workers
- Health workers working in shifts
- Work overload due reduced number
- Curfew leading to early departure of health workers from work
- Capacity building affected due to face to face training restrictions

“There was a significant drop in training volumes and cancellations of face-to-face training opportunities in the programme due to Covid-19. Only 4 out of 25 planned courses were conducted since the emergence of Covid-19”

“The demands of the Covid-19 response had placed considerable strain on the staff of Global Health Security necessitating the establishment of mechanisms to prevent staff burnout”

health workers have died; by 28th December 2020, fifteen had succumbed to Covid-19. These deaths robbed the country of the health personnel who would be part of the team providing HIV related services; and therefore presumed to have affected HIV programme performance. To minimize the risk of workers being infected at work, most health institutions, adopted a strategy to downsize staff working physically at health facilities. Certain categories of health workers worked from and continue to work from home. This also led to health workers working in shifts, a strategy that led to fewer health workers working during certain times with resulting work overload. The work overload brought about by few staff working on shifts adversely affected the general health service delivery. Staff who would otherwise remain working beyond 7 pm had to leave earlier due to the 9 O'clock curfew. In some circumstances, the anticipation of burnout setting in due to heavy workload led to some remedial actions¹¹⁷.

Additionally, whenever health workers of a particular facility got infected with Covid-19, quarantine of contacts of the infected health workers would ensue with resultant reduction in the number of health workers to provide services. At times, the affected health units would close down leaving the population in catchment area without health service¹¹⁸. Furthermore, a number

Monitor Newspaper of 22nd November 2020 (Article by Tonny Abet)

“The closure of hospitals in some districts due to Covid-19 infections among health workers has left thousands of patients stranded”. Nyabirongo Health Centre III which serves about 20,000 people was reportedly closed after the majority of its workers tested positive. Kyondo Health Centre III in Kisinga Sub-county was also affected.

of health workers got preoccupied by the Covid-19 work with reduced attention to the general health services including HIV services. Also, capacity building of health workers which is usually done through training was adversely affected because of the suspension of face to face

¹¹⁶ Uganda Ministry of Health.: Covid-19 Sitrep 318. 2nd January 2021.

¹¹⁷ Infectious Disease Institute. Quarterly Progress Report.

¹¹⁸ <https://www.monitor.co.ug/uganda/news/national/hospitals-close-as-health-workers-contrast-covid-3207820>

activities. Training activities were significantly reduced especially during the first 4 months of the pandemic in Uganda. It is not until virtual training through zoom when the training resumed. The success of this alternative approach was of course contingent of the ability to acquire the requisite internet and zoom connectivity.

Many organizations reported taking actions to keep their employees safe from Covid-19 and to mitigate the impact of Covid-19 on health services, including HIV services. To prevent Covid-19 infection within institutions, infection prevention and control measures were taken through enforcement of social distancing, provision of hand washing facilities and sanitizer at the entrances, strengthening internet connectivity to facilitate virtual meetings and reallocation of funds to cater for procurement of personal protective equipment (PPE). The adjacent box highlights some of the specific actions.

Quote from a Key Informant Interview participant

“Community based, peer-led interventions, mobile services, online/telephone based support, among others have been used to mitigate the impact” of Covid-19 on HIV services.

4.16.4 Health information system

Monitoring of the HIV programmes relies upon data collection. The different sources of data include routinely collected data such as done at health facility level and programme data at implementation level. Research is another big source of data; this can be conducted amongst others through face to face interviews, online interviews and collection of samples from clients for laboratory analysis. In Uganda, most research involve interface with research participants. Due to potential risk of Covid-19 infection during research, research was suspended for ~3 months following the onset of Covid-19 pandemic in Uganda. On the 27th March 2020, the Uganda National Council for Science & Technology (UNCST) issued guidance halting the recruitment of new study participants¹¹⁹. All researchers were encouraged to suspend recruitment of new study participants because of the additional risks the clinical teams and patients at the hospitals, recruitment facilities and sites are likely to face. Furthermore, researchers were guided that “participants already recruited and require follow up should not be invited to hospitals or recruitment sites, but rather use telephone call based follow up to complete follow up procedures” and that “study teams were also encouraged to provide research participants with enough supplies during this quarantine period”.

In compliance with the above guidance, implementation of studies was suspended. For instance, the data collection processes for both UPHIA2020 and UDHS were interrupted; and other investigators reported a significant reduction in research operations due to Covid-19 lockdown and limited numbers of research protocol approvals. The UPHIA and UDHS are designated as sources of data for populating several core indicators for monitoring HIV programmes. Although this moratorium by the UNCST was lifted on the 4th June 2020¹²⁰, these surveys have not yet been completed. With the guidance on resumption of research, investigators were advised to maintain a distance of at least 2 meters during activities such as consenting, focus group discussion and training to prevent Covid-19 infection.

Interviews conducted virtually were at times affected by internet and power cuts. This also limited the duration of interviews. Additionally, verbal communication which is important at

¹¹⁹ Uganda National Council for Science and Technology. Public Notice. New procedures on research registration and registration and clearance during the Corona virus (Covid-19) pandemic. 27th March 2020.

¹²⁰ Uganda National Council for Science and Technology. Public Notice. Resumption of research activities during the Covid-19 pandemic. 4th June 2020.

some circumstances was missed. To deal with this, research teams had to follow up the interviewees by email to get the in depth analysis of the topics of discussion (IDRC Uganda).

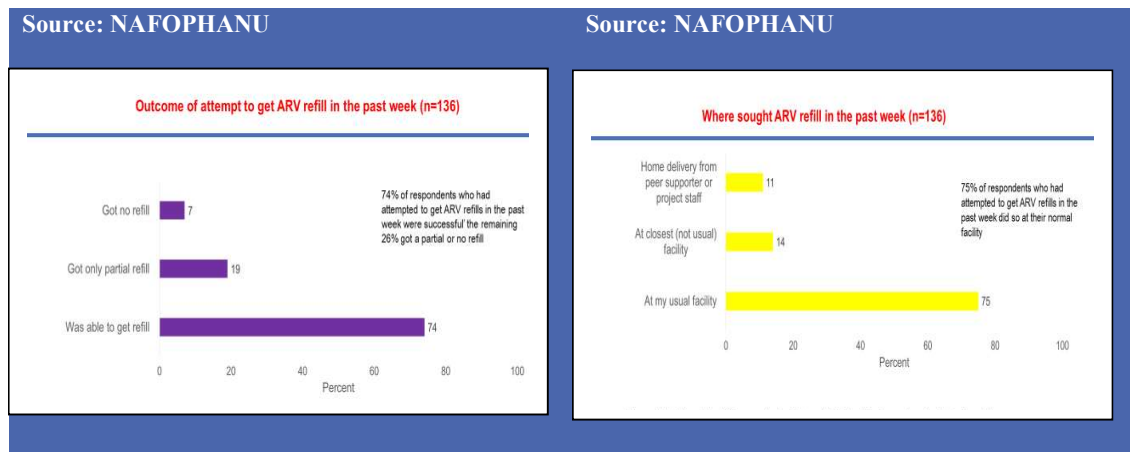
4.16.5 Access to essential medicines

It is crucial to maintain a functional supply chain management system of HIV prevention and treatment commodities all the time. This is so because interruption of supplies of HIV prevention has grave implications. Examples of such implications are; lack of test kits leading to inability to perform HTS and viral load monitoring, lack of condoms leading to unprotected sex, lack of ARVs leading to non-adherence and lack TB drugs leading to treatment interruption. During the initial phase of Covid-19 pandemic in Uganda especially when there was a lockdown, the supply chain system for HIV prevention and treatment commodities was affected. Inability of some patients to collect their ARV drug refills on schedule has been documented. Relatedly, a decline in viral load testing was reported. Following Covid-19 pandemic, there have been interruptions in HIV supplies and access to services (JAR 2020). Viral load coverage dropped from 96% in December 2019 to 85% in June 2020 as a result of PLHIV missing their scheduled blood draws following the Covid-19 pandemic lockdown.

The reported inability to pick drugs has implications on treatment adherence. To address this

Source: ICWEA - Quote from a PLHIV: “Accessing my treatment was another issue as I could not move to the center where I get medicine. I have not got my viral load monitored since then yet I was due for viral load testing in April”

challenge, treatment centres opted for multi-month drug refills. Also, international partners working in Uganda issued guidelines to in-country implementing personnel (UNICEF, FHI360¹²¹). FHI360 guided that the project teams providing support for HIV treatment services must prioritize technical priorities to ensure uninterrupted essential HIV treatment services. These include: i) Enhanced patient communication and teleconsultations; ii) Advancing decentralized drug distribution, iii) Leveraging multi-month dispensing (MMD) for ART, tuberculosis preventive therapy (TPT), and Cotrimoxazole preventive therapy (CPT), and iv) Ensuring retention of patients in care.



¹²¹ FHI360.: Ensuring uninterrupted essential HIV treatment services to clients during the COVID-19 pandemic. Meeting targets and maintaining epidemic control (EPIC) project. Cooperative Agreement No. 7200AA19CA00002.

4.16.6 Financing

By the time Covid-19 pandemic was reported in Uganda bringing on board additional funding pressure, domestic funding for the HIV programmes had been red-flagged. In the recent years, Government of Uganda annual budgetary allocation was ~8.9% of the total national budget; and the health expenditure funding to HIV within the health sector stagnated at about 18% of the total health sector budget (HSHASP). The HIV programmes are heavily donor dependent as close to ~80% comes from donors. In addition to increasing the demand for funding, Covid-19 affected revenue collection. Loss of revenue at national and local levels has been reported¹²². Covid-19 also affected spending and therefore absorption of project funds for HIV interventions, especially community level interventions and school programmes.

To avoid negative impact arising from the heightened fiscal pressure due to Covid-19, Government of Uganda was advised to mobilize additional funding from partners and avoid reallocating monies already ear-marked for programmes such the HIV programmes (UNDP-Uganda).

Scaling up existing social protection programmes and re-purposing them to protect the most vulnerable such as the youth, poor, women and

people with HIV/AIDS was another recommendation. Furthermore, it was recommended that partners should work with the National Planning Authority (NPA) and Ministry of Finance (MoFPED) on how COVID-19 will affect NDPIII assumptions for the next five years and take appropriate action in building the resilience of the economy.

The Minister of Finance's preliminary assessment on March 20, 2020 of the short-term impact of the pandemic

The Minister anticipated the following Covid-19 impact on the national economy:

- Increase in the number of poor people by 2.6 million;
- Significant deterioration of the current account balance owing to expected severe reduction in exports, tourism receipts and workers' remittances;
- Domestic revenue shortfall of Shs288.3 billion in FY 2019/20 and Shs350 billion in FY 2020/21 due a reduction in economic activity. Uganda Revenue Authority anticipate a loss of UGX 116.26 billion in customs revenue by the end of June due to this crisis alone, expanding the overall revenue loss UGX 513.26 billion by close of June 2020.
- Heightened pressure on fiscal space as a result of additional expenditure to address rapid response in the health sector and livelihood support for affected persons.

4.16.7 Governance, leadership and management

Part and parcel of its leadership role of the public health response to the HIV/AIDS epidemic, the AIDS Control Programme in MoH provides overall technical leadership and is responsible for policy formulation, guidelines development, resource mobilisation, capacity building, coordination and monitoring implementation at all levels. Coordination of partners, engagement of stakeholders through meetings, support supervision of districts and implementing partners; are some of the ingredients of leadership and governance. Due to limitations on social gathering and lockdown brought by Covid-19 pandemic, in the last quarter of 2019/20 financial year, a number of leadership functions were curtailed. Physical meetings could not take place at national and local levels. The inability to conduct meetings theoretically affected resolution of matters which would be resolved through meetings. Furthermore, due to travel restrictions, support supervision reduced with implications on programme monitoring. To address this bottleneck, meetings shifted on zoom.

Meetings by the other HIV stakeholders at both national and district levels were also affected due to the restrictions of movements and gathering.

¹²² UNDP-Uganda. Socio-economic impact of Covid-19 in Uganda: short-, medium-, and long-term effects on poverty dynamics and SGDs using scenario analysis and system dynamics modelling. Covid-19 policy brief #1 prepared by UNDP-Uganda. April 2020.

Chapter 5: Designing an Optimal HIV Response for Maximum Impact

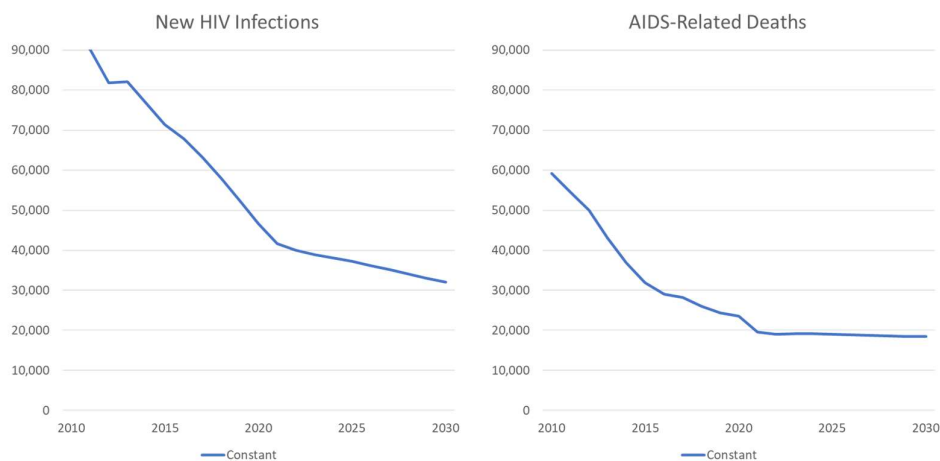
5.1 Programme Coverage Scenarios Considered

In order to assess the potential future course of the HIV epidemic, various programme services coverage scenarios were considered for the period 2021 – 30 in the goals model set up as described in section 2.3.

5.1.1. Constant Coverage

The number of new HIV infections and AIDS deaths have declined substantially since 2010. However, that decline will slow considerably if the current program effort remains constant (constant coverage of ART, SMC, condoms, etc.). Figure 5.1 shows the estimated trend from 2010 to 2019 and the projected future trend to 2030 under the assumption of constant coverage of all interventions.

Figure 5.1. New infections and AIDS deaths with constant intervention coverage



Under this scenario new infections will decline by 50% from 2010-2020 (less than the global target of 75% decline) and by 66% from 2010-2030 (less than the global target of 90%). AIDS-related deaths will decline by 60% and 69% over the same periods, short of the global goals of 75% and 90%.

5.1.2 Prioritized Scale-Up Scenario

To estimate the impact of further scale-up of the program during the next decade and beyond we created an alternative projection, called the Prioritized Scale-Up Scenario. This scenario envisions rapid scale-up to maximum feasible coverage of a comprehensive set of interventions. The targets applied are shown in Table 5.1. Treatment has already reached high levels of coverage. This scenario assumes that it increases to reach 90% coverage of all PLHIV by 2025 and to 95% by 2030. Testing percent of the population that needs to be tested each year will actually decline once high knowledge of status is reached. The program can shift to focus on finding those newly infected with target approaches such as index partner testing, risk assessment for provider-initiated testing and expansion of self-testing.

The critical interventions for impact are testing, treatment, condoms, SMC, PMTCT, EID and programs for key populations. These all have proven effectiveness. Other programs (SBCC, AGYW, stigma, violence) are enablers that may influence the uptake of key services and may provide non-HIV benefits but their impact on HIV is not as well documented.

We have assumed aggressive targets for AGYW, ABYM, violence prevention and stigma in order to illustrate the impact and cost of achieving high coverage in these areas. In the final analysis, these targets may be scaled back or implemented with co-funding from other sectors.

PEPFAR plans to reach 336,000 AGYW in 15 high-burden districts at a cost of about \$15 million per year. This target represents about 16% of all AGYW. If the Global Fund grant could access an additional \$4.7 million over three years, coverage could be increased to about 22% by expanding to additional high-burden districts.

Table 5.1. Coverage targets for Prioritized Scale-Up

Intervention	2019	2025	2030
Testing (% adults tested annually)¹²³	15%	5%	5%
Percent of population diagnosed	87%	90%	95%
Annual number of new diagnoses		8,700	14,000
Percentage of tests by type			
-Provider initiated	70%	40%	40%
-Index partner testing (APN)	10%	30%	30%
-Community-based testing	15%	5%	5%
-Self-Tests	5%	25%	25%
Early infant diagnosis	88%	95%	95%
Treatment			
Adult women	93%	93%	93%
Adult men	81%	93%	93%
Children	74%	95%	95%
Viral load suppression	86%	95%	95%
PMTCT	95%	95%	95%
General population aged 25+			
Condom use with non-regular partner	32%	50%	70%
SBCC campaigns per year	0	3	3
Community norms change (SASA!)	0	80%	80%
PrEP	0%	0%	0%
Programs for key populations			
Female sex workers (FSW)	77%	90%	90%
Men who have sex with men (MSM)	35%	90%	90%
People who inject drugs (PWID)	8%	90%	90%
PrEP for sero-discordant couples	0%	100%	100%
Programs for adolescent girls and young women (AGYW)			
Violence prevention	8%	16%	22%
Family planning	8%	16%	22%
Parenting/care giver programs	8%	16%	22%
Educational subsidies	8%	16%	22%
Economic empowerment	0%	16%	22%
Comprehensive sexuality education	8%	16%	22%
Community activities to change norms	8%	16%	22%
PrEP	1%	4%	7%
Programs for adolescent boys and young men (ABYM)			
Safe medical circumcision	68%	90%	90%
Condom use with non-regular partners	41%	60%	80%
Comprehensive sexuality education	8%	16%	20%
Programs to reduce stigma and discrimination			
Community norms change	0%	50%	90%
Training for health care providers	0%	50%	90%
Training for law enforcement officers	0%	50%	90%
Workshops to PLHIV to address internalized stigma	0%	50%	90%
Prevention of gender-based violence			

¹²³ Testing coverage declines as knowledge of status reaches very high levels as fewer tests are needed to sustain knowledge than in the catch-up phase.

Community activities to change norms	0%	45%	90%
Outreach to male youth	0%	45%	90%
Economic empowerment for women	0%	45%	90%
Mass media	0%	45%	90%
Counselling for victims of violence	10%	50%	90%
Treatment for rape victims	20%	55%	90%

5.2 Projected Impact

Projections of new infections and AIDS deaths under the Constant and Prioritized Scale-Up Scenarios are shown in Figure 5.2. With Prioritized Scale-Up new infections decline by 71% from 2019 to 2025 reaching 15,000 2025, averting 72,000 new infections during this period, about 43% of the infections that would have otherwise occurred. AIDS-related deaths decline by 71% averting 42,000 deaths during this period. (There is also a decline in AIDS deaths in the constant coverage scenario due to the large increase in the number on ART in 2019 with most of those newly on ART surviving to the second year on treatment which has lower mortality rates than the first year on treatment.)

Figure 5.2 New Infections and AIDS Deaths by Scenario

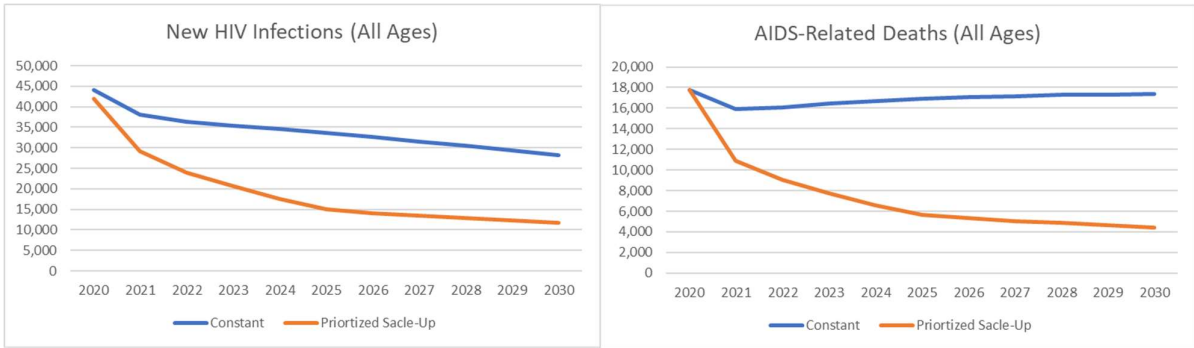


Figure 5.3 compares new HIV infections with deaths to PLHIV from all causes. The lines cross in 2023 indicating an epidemic transition in which the number of PLHIV will continue declining.

The trend in new infections among adolescent girls and young women (AGYW) is shown in Figure 5.4 (a). New infections decline by 85% from 2019 to 2025 to about 2,000 per year.

Figure 5.4 (b) shows that new child infections are expected to decline substantially under both scenarios. Since coverage of PMTCT services is already high, the decline is largely due to reduced prevalence among pregnant women.

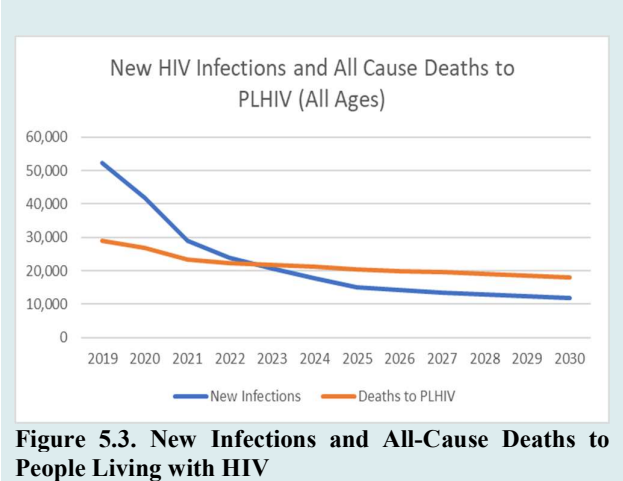
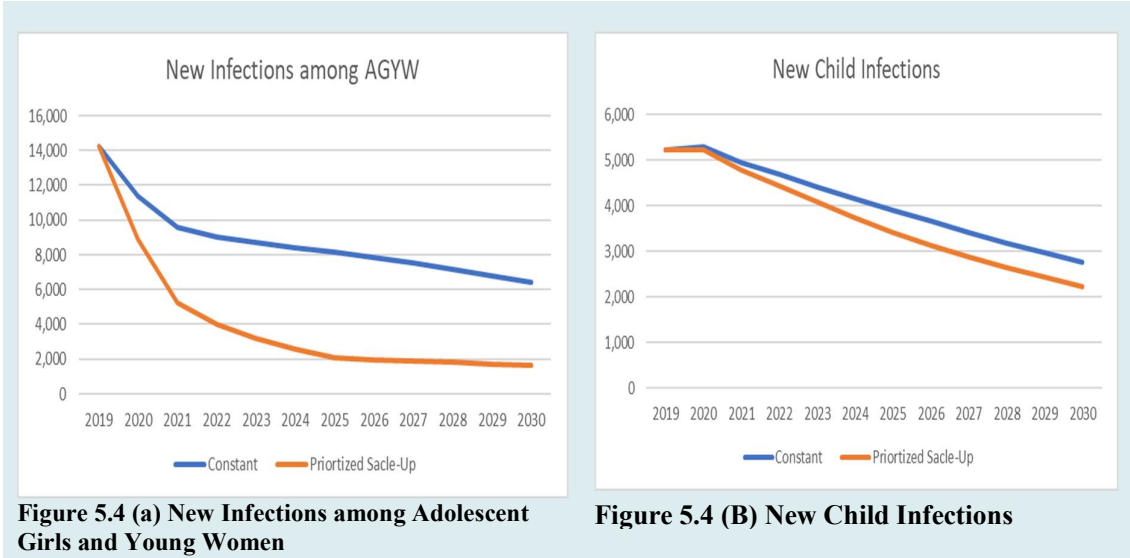


Figure 5.3. New Infections and All-Cause Deaths to People Living with HIV

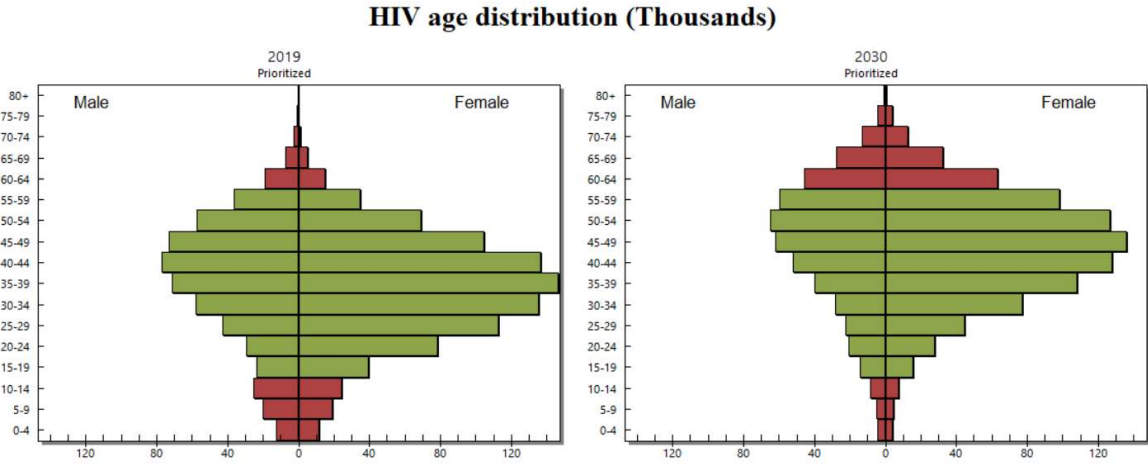
The age distribution of the population living with HIV will change over the next ten years as fewer new infections are added at the younger ages and fewer AIDS deaths occur at older ages. The proportion of PLHIV under age 25 will drop from 19% in 2019 to 12% by 2025 and to 8% by 2030 and the proportion 50 and older will rise from just 16% in 2019 to 41% by 2030, Figure 5.5.



5.3 Projected Costs

The costs for each intervention are estimated as the population in need of the service multiplied by the coverage (the percentage actually using the service) multiplied by the unit costs. We assume that the unit costs of most interventions remain constant

Figure 5.5. Age and Sex Distribution of PLHIV under the Prioritized Scale-Up Scenario



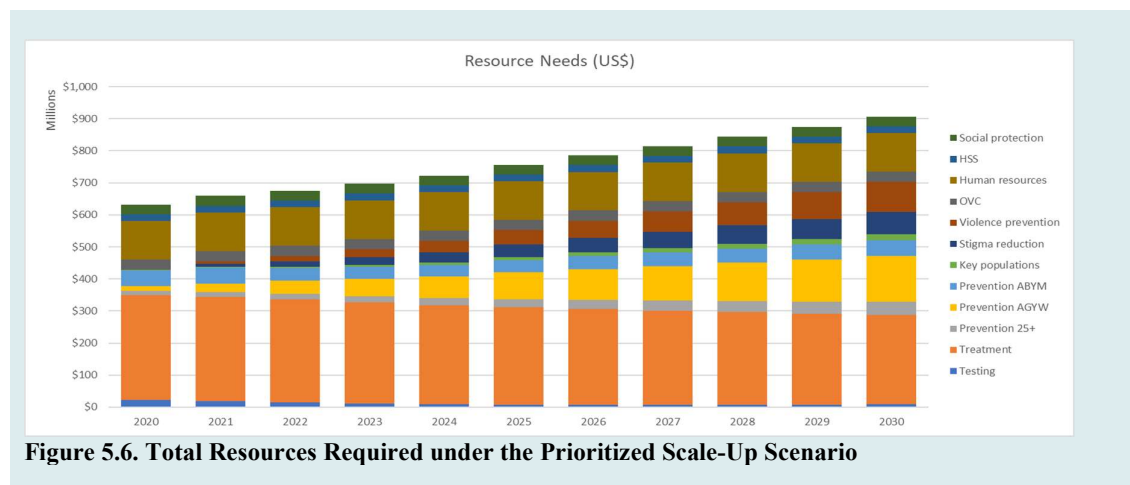
In the Prioritized Scale-Up scenario total required expenditure will rise by 20% from 2020 to 2025 as shown in Figure 5.6. The annual cost of treatment declines by \$13 million by 2025 because of the transition to differentiated service delivery described above. Annual testing costs decline by \$14 million as testing volumes decrease. The costs of safe medical circumcision decline by \$15 million annually once the program reaches its coverage target and switches to the maintenance phase. These savings are offset by increases in resources needed for key populations (\$7 million), condom promotion (\$11 million), community interventions such as SASA! (\$41 million) and PrEP for sero-discordant couples.

Significant increases in resource needs are projected for programs for AGYW, stigma reduction and prevention of violence. Annual expenditures for AGYW increase to \$87 million by 2025. The largest amounts would be needed for PrEP (\$30 million), economic empowerment (\$21 million) and education subsidy (\$15 million). PrEP costs could be reduced by limiting the use

of PrEP to the areas and populations with the highest risk. The other programs all have benefits beyond the HIV prevention so the costs might be shared with other sectors.

Large increases in funding would also be required to expand programs to reduce stigma (\$40 million in 2030) and programs to reduce violence against women (\$70 million). The largest component of violence prevention is economic empowerment. This may be one of the most effective interventions, but it is costly. However, it produces benefits beyond HIV so the costs should be shared with other sectors. We have assumed that resources need for OVC, human resources, HSS, and social protection would remain constant over this period.

In summary, the core programs (testing, treatment, HIV prevention) can be scaled up with no increase in current expenditures. Scaling up social programs for AGYW and violence prevention would require a significant increase in funding but, because of the broad benefits, should be partially funded by other sectors. Programs to reduce stigma are the responsibility of the HIV sector. The costs of an effective program are only approximated here. More work needs to be done to refine the interventions and associated costs. If these social enablers are not implemented it will be difficult if not impossible to reach many of the ambitious coverage targets in the Prioritized Scale-Up scenario.



In the Prioritized Scale-Up the costs of some interventions are kept low by targeting only a subset of the population. The prime example is testing, where we assume that testing costs could actually decline over time if testing is targeted to those populations most likely to test positive, such as index case partners. To maintain the same level of population testing at current levels would require an additional \$13 million in 2025.

The PEPFAR program has been the main funder of the SMC program. PEPFAR resources for SMC are now focused on boys aged 15 and above. To date about one-third of SMCs have been to boys 10-14. If the government wished to fund SMC for 10-14 years olds it would cost about \$8 million per year. This would reduce amount needed from PEPFAR as some boys would already be circumcised when reaching age 15.

5.4 Cost-effectiveness

Since the core programs (testing, treatment, SMC, condoms, services for key populations) actually require less than current expenditure and avert substantial numbers of new infections and AIDS deaths, they are clearly cost-effective and, in fact, cost savings. However, it may not be possible to reach those ambitious targets without also addressing the social enablers.

For the period 2021-2025 the incremental cost of the Prioritized Scale-Up scenario is \$450 million, and it averts 44,000 new infections during that period. The cost per infection averted (undiscounted) is about \$10,000. For the period 2021-2030 the incremental costs are significantly higher (\$1.7 billion) and the cost per infection averted is about \$15,000.

Testing and treatment are the most cost-effective interventions since they are cost savings over the period 2021-2025. SMC is highly cost-effective at about \$800 per infection averted when the full future benefits are taken into account. Also cost-effective are programs for key populations (\$5100 per infection averted) and condom promotion (\$6500 per infection). Much more expensive are programs for AGYW (\$83,000 per infection averted) and PrEP for the general population (\$740,000 per infection averted). It should be noted that PrEP is also included in programs for key populations and for AGYW.

Figure 5.7 show the distribution of districts by HIV incidence in the population aged 15-49. While treatment programs are needed everywhere there are PLHIV, prevention programs will be more cost-effective in the high incidence districts. Incidence is 1% or above in 20 districts. These should certainly be the priority for any geographic allocations. Another 23 districts have incidence between 0.8% and 1.0%. These 43 high incidence districts account for 26% of all new infections and thus constitute a geographic core where prevention interventions might be scaled up first to achieve maximum cost-effectiveness.

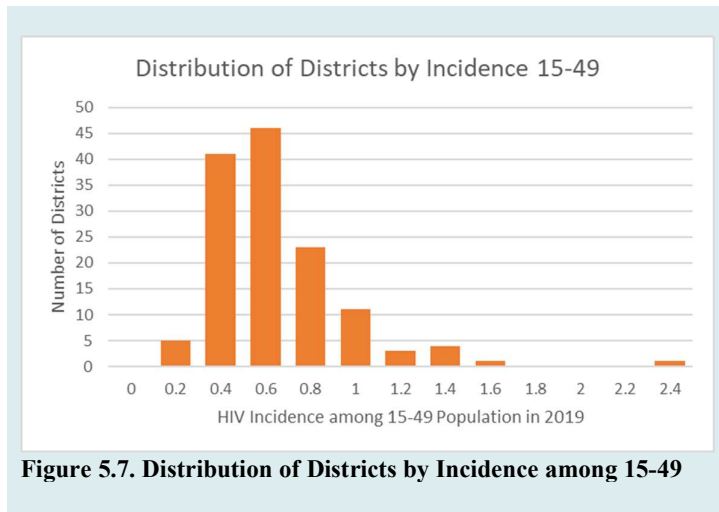


Figure 5.7. Distribution of Districts by Incidence among 15-49

5.5 Productivity gains and return on investment

When people are sick with HIV, they may miss work or perform at reduced productivity. The productivity gains from scaling-up treatment can be estimated from the number of people living with HIV who are not on ART and have CD4 counts below 200 cell/ml¹²⁴. Applying these calculations to the Prioritized Scale-Up and Constant scenarios indicates a cumulative productivity gain of \$38 million from 2021-2025 and \$140 million from 2021-2030.

The Prioritized Scale-Up scenario costs more than the Constant scenario. Is it worth the extra cost? To answer this question, economists have developed the full-income approach which estimates a value on changes in income and mortality.¹²⁵ Using a 3 percent annual discount rate the cumulative incremental cost of the Prioritized scenario for 2020-2025 is \$569 million. The cumulative discounted benefits are \$3.2 billion¹²⁶. Thus, the return on investment for the Prioritized scenario is 5.6. This high return clearly demonstrates the value of the additional investment.

¹²⁴ Resch S, Korenromp E, Stover J, Blakley M, Krubiner C, et al. (2011) Economic Returns to Investment in AIDS Treatment in Low and Middle Income Countries. PLoS ONE 6(10): e25310. doi:10.1371/journal.pone.0025310

¹²⁵ Lamontagne E, Over M, Stover J. The economic returns of ending the AIDS epidemic as a public health threat, Health Policy 123 (2019) 104-108.

¹²⁶ Benefits are calculated as the reduction in standard mortality units (SMUs) estimated as deaths per 100,000 population, multiplied by the value of a one-unit reduction in the SMU. This value (VSMU) is estimated as 1.8% of GNP/capita.

Chapter 6: Costs and Financing of the Investment Case Framework

6.1 Review of Past and Current HIV/AIDS Funding

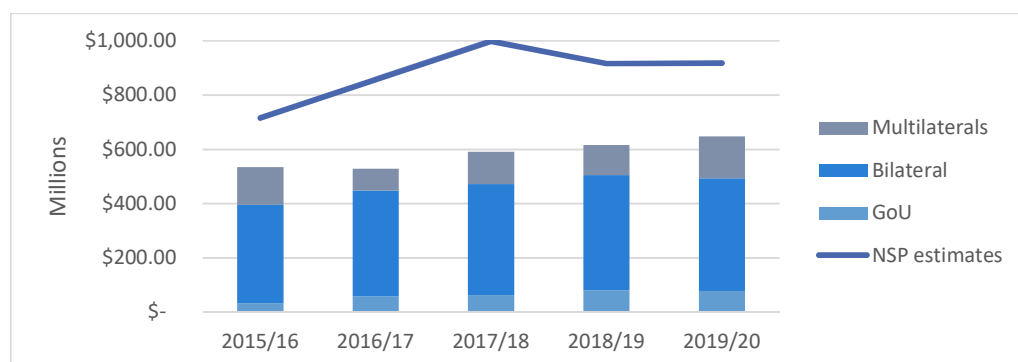
The previous HIV/AIDS investment case framework was estimated to cost US\$ 9.6 billion over ten years 2015 – 2020, with the first five years 2015/16-2019/20 costing approximately US\$ 4.4 billion. Annual costs were projected to grow from US\$ 516 million with a peak of US\$ 998 million in 2017 and gradually drop to US\$ 916 by the 2019, Table 6.1.

Table 1: Resource estimates for the HIV Investments Case 2015-2024

Category	Estimated Annual Costs (US\$ Millions)											
	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Prevention	91	183	207	232	159	164	168	173	178	182	187	192
Care/Treatment	282	342	426	511	518	516	510	511	511	511	511	510
OVC	28	28	28	28	28	28	28	28	28	28	28	28
Program support	115	163	196	227	210	211	210	135	136	137	138	139
Total USD million	516	716	857	998	916	918	916	848	853	859	865	870

The costs were projected to cover key services that would be scaled up rapidly to attain maximum coverage by 2018, and thereafter be maintained at the peak's targets. This rapid increase also included costs for rapid modifications and refurbishments of the Health infrastructure, systems and human resources. A review of the expenditure for the first five years revealed that approximately US\$ 3.023 billion was realised leaving a funding gap of approximately US\$ 1.3 billion as shown in the Figure 6.1 below.

Figure 6.1: Funds Realized for the HIV Investments case 2015-2020



The total resource envelope for this period was approximately US\$ 3.15 billion that were realised through three major sources: Governments of Uganda (10%); Development Partners support (82%); and out-of-pocket contributions from individuals and households (8%). The out-of-pocket contribution reflected largely covers cost of services received.

By far, the USG provided the largest share of support for the national response, contributing nearly US\$ 2 billion over the five years, followed by the Global Fund, US\$ 444 million. GoU financing accounted for approximately US\$ 315 million.

Table 6.2: Funding estimates for the Country HIV response 2015 - 2020

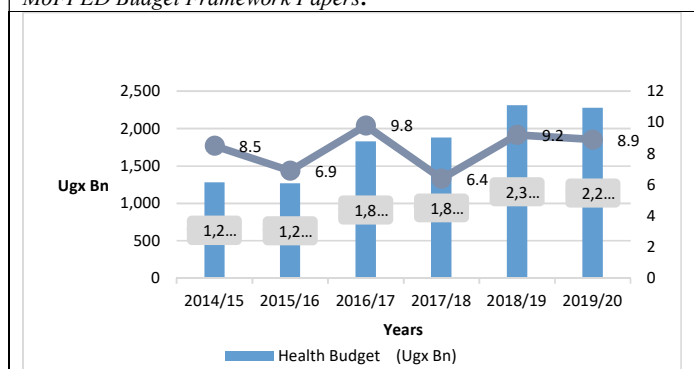
Funding Source	HIV/IDS Funding for the National Response (US\$ 000s)					Totals
	2015/16	2016/17	2017/18	2018/19	2019/20	
GoU	32,546	59,101	62,977	81,000	79,512	315,137
USG	354,677	383,350	402,392	420,540	410,000	1,970,960

Irish Aid	2,365	4,373	4,558	4,140	4,170	19,606
DFID	3,515	-	-	-	-	3,515
SIDA	2,345	2,160	2,160	-	-	6,665
CHAI	1,279	1,435	1,507	1,870	1,304	7,394
Global Fund	104,240	44,910	88,939	82,667	123,748	444,504
UN Agencies	16,342	15,293	14,195	13,820	17,716	77,366
Research funding	17,120	18,191	14,260	12,190	12,366	74,127
Total	534,430	528,813	590,988	616,227	648,815	2,919,273

6.1.1 The Government of Uganda Funding.

The GoU funds the HIV response through budget allocations to the health sector; the decentralized response through district local governments, MDAs, and government grants to NPHFs. The GoU funds also covered medical and health supplies provided through National Medical Stores; health workforce in public facilities, health systems, and infrastructure.

Figure 6.2: GoU contributions to the Health sector 2014/15 - 2019/20
MoFPED Budget Framework Papers.



The GoU funding to the health sector has averaged 7%-9.8% of annual Government spending which conspicuously falls below the 15% target set in the Abuja Declaration. This left the health sector with funding gaps which affected the HIV response as well.

The GoU resources financed: i) procurements of HIV commodities and other medical supplies through NMS - over the years GoU

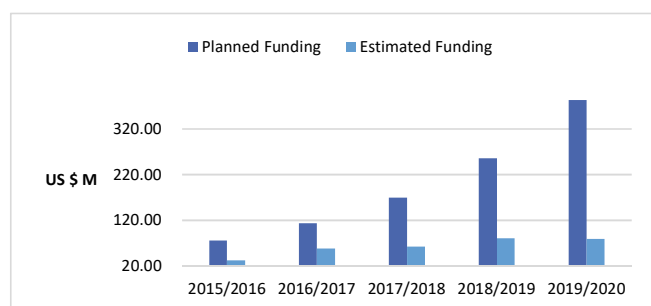
allocated US\$ 94 billion per year to NMS for procurement of ARVs. It also allocated additional US\$ 50 billion to offset currency conversion effects of inflation on the exchange rate for procurements sourced out of the country. To mitigate fiscal shocks resulting from any budgets cuts, GoU purposively ring-fenced funds for procurement of ARVs, and rapid test kits with NMS; ii) funding allocations to the multisectoral coordination under UAC, AIDS Control Programme in MoH; iii) resources for the decentralised response under the MoLG and contributions to the MDA. Table 6.3 below highlights GoU contribution.

Table 6.3 GoU Funding for the HIV response.

Funding area	GoU Contribution to the HIV Response (UGX Millions)				
	FY 2015/16	FY 2016/17	FY 2017/18	FY 2018/19	FY 2019/20
NMS ARVs	94,891	94,891	94,891	86,931	140,329
MoH ACP *	12,299	12,422	12,546	15,055	15,206
MoH GF Coordination	2,589	2,589	2,589	2,275	2,575
Uganda Aids Commission	7,241	7,241	7,241	6,867	8,842
Uganda CCM	800	800	800	800	800
JCRC	242	242	242	242	242
UVRI	366	366	366	366	366
Decentralised response **	648	80,497	96,597	173,874	116,496
Total	119,076	199,048	215,272	286,411	284,856
Total (US Dollar Equivalent)	33.1	57.8	61.5	81.8	79.1

Despite the stagnating proportionate health sector funding, GoU continued to demonstrate its commitment to the HIV response through nominal increase in domestic funding for HIV from US\$ 32 million in 2015/16 to US\$ 79 million in 2019/20. However, this accounts for less than 25% of the total HIV resources, and also lower than planned domestic resources resulting into domestic deficits across the years as illustrated in Figure 6.3 below.

Figure 6.3: Planned versus Actual domestic funding for the HIV Response



The estimated planned funding from GoU is expected to be 10% of the total HIV budget. The figures for GoU funding reflect only ringed-fenced funds for HIV commodities under NMS; the budget allocations to the UAC and support to HIV specific institutions. Work is underway to quantify the HIV funding through the

MDA mainstreaming efforts, projected to gross about UGX 38.86 billion for 2019/20. (US\$ 10.6 Million)¹²⁷. However actual utilisation of the mainstreamed funds is yet to be ascertained.

6.1.2 Development Partners.

Multilateral and bilateral development partners contributed approximately 75% of HIV resources in the country. The funds were channelled through on and off budget support. The partners included the United States Government, the Global Fund, Irish AID, Danish Embassy, DFID, and SIDA. In 2017, DFID's HIV funds were redirected through the Global Fund, while Irish AID, DANIDA and SIDA now focus on the broader country development programs and health sector wide approach through budget support. In total development partner contributions have been estimated at US\$ Dollars 2.6 billion over this period Table 6.4 below.

Table 6.4 Development Partner Contribution for the Period 2015/16- 2019/20.

	2015/16	2016/17	2017/18	2018/19	2019/20	Totals
Bilateral						
USG	354,677	383,350	402,392	420,540	410,000	1,970,960
Irish Aid	2,365	4,373	4,558	4,140	4,170	19,606
DFID	3,515	-	-	-	-	3,515
SIDA	2,345	2,160	2,160	-	-	6,665
Sub totals	362,903	389,883	409,110	424,680	414,170	2,000,746
Multilateral Agencies						
CHAI	1,279	1,435	1,507	1,870	1,304	7,394
Global Fund	104,240	44,910	88,939	82,667	123,748	444,504
UN Agencies	16,342	15,293	14,195	13,820	17,716	77,366
Research funding	17,120	18,191	14,260	12,190	12,366	74,127
Sub totals	138,980	79,830	118,901	110,547	155,133	603,391
	501,883	469,712	528,011	535,227	569,303	2,604,137

6.1.3 Private Sector and Out of Pocket contributions

Out-of-pocket expenditure were borne directly by clients when they sought health-care services. The major categories of expenditures under the OOP include transport to and from facilities, medical consultations, medicines and health supplies and to an extent the additional nutritional requirements a client gets in order to enhance health recovery. The OOP estimates

¹²⁷ The Republic of Uganda Annual AIDS Review report 2019/20 pg115

are still scanty and the provisional figure indicate approximately US\$ 37 million for the year 2019/20 which was the basis for the extrapolation of the previous year’s estimates.

6.1.4 Review of Resource Utilization

HIV Care and Treatment services accounted for the biggest share of HIV funding (53%), while HIV prevention accounted for 22%; programme management, 14%; social support, 7%; strategic information, 3%, and Research, 1%. The cost driver under HIV care and treatment was cost of ARVs and clinical monitoring services.

Further analysis revealed that some interventions were underfunded compared to planned resource requirements, Table 6.4.

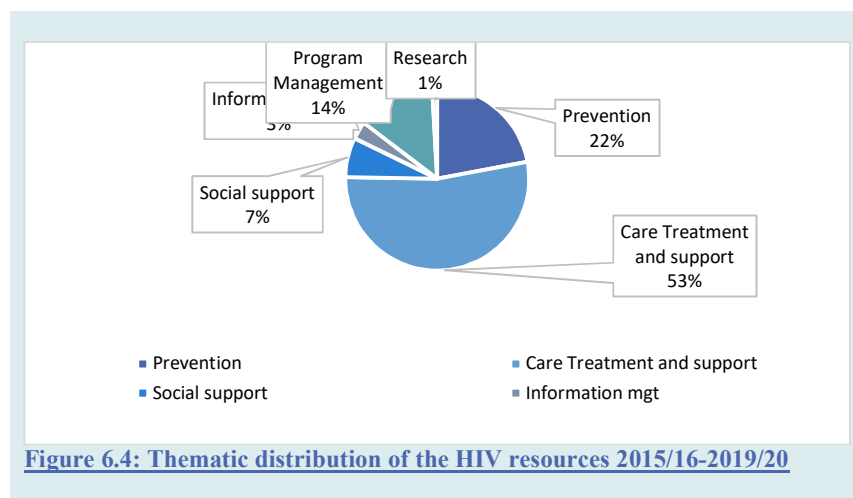


Figure 6.4: Thematic distribution of the HIV resources 2015/16-2019/20

resource requirements, Table 6.4.

The funding gaps partly arose from shortfall in financing, and changes in HIV response brought about by programme innovations. For instance, changes in ART eligibility criteria from a cut off

of CD4 count of <350 cell/ul to CD4 < 500 cells/ul, within less than a year rendered the projected cost estimates stale. The “test and treat” guidelines further drifted the initial resource estimates further away from the initial costs.

Table 6.4: Funding Analysis for selected HIV Commodities: 2015/16-2019/20.

Cost tem	Budget	Funding realised	Funding Gap
US \$' Million”			
HIV Test kits	151.44	77.45	73.98
Viral Load and EID	165.61	98.49	67.12
CD-4 count kits	39.59	10.79	28.81
Other Lab commodities	79.94	16.32	63.62
Sub Totals	436.58	203.05	233.53

6.1.5 Efficiencies in Resource Utilization

The HIV response benefitted from technical and allocative efficiencies that partly account for achievements in a number of programmatic targets.

Allocative efficiencies arose from improvement in procurement systems and other technical efficiencies. These comprised of: a) Procurement mechanism for health commodities; b) rationalisation of logistics and warehousing; c) revision in HIV testing protocols to targeted testing; d) change in treatment regimens; e) harmonising Implementing Partners with reduction in duplication of services.

Efficiencies largely attributed to commodity procurement mechanism include the Global Fund voluntary pooled procurement (VPP) mechanism, and CHAI for paediatric supplies that led to savings. The Global Fund VPP mechanism allowed price negotiation on bulk purchases which led to saving that were reinvested on gap filling and investments in critical areas that were initially not funded. A case to cite is the procurements of laboratory supply for Viral Load

testing which was initially not planned in GF grants. Other efficiencies were realised through the following:

a) **Rationalising of the logistics and warehousing:** This rationalisation was premised on the need to operationalise central level inter-warehouse supply management system, to allow free movements of the health products across warehouses to avert stock outs, overstocks and expiries. Under this system commodities are reallocated to a warehouse whose stock demands exceeds its current supply. This was reflected in reduction of facility level stock outs from in 33% 2016 to 17% in 2019/20.

The introduction of the “One-facility One-warehouse” concept further improved commodity and resource management. It reduced incidences of multiple deliveries by the various warehouses resulting into more efficient use of the resources. Another milestone in the inventory management was the introduction of the “one facility one stock card” - where all commodities are handled together irrespective of the funding mechanism - this improved how facilities account for commodities and drug dispensing.

b) **Revision of the HIV testing protocols to targeted testing:** The revision of the testing protocols to targeted testing resulted to similar outputs (a yield 3% in the positivity rate) even with reduced numbers of persons tested. **The period 2015-2020 saw an annual average of 8,641,264 HTS tests conducted with a yield new infections at 3%.**

c) **Rationalisation of Implementing Partners:** Prior to 2014, the HIV response had Implementing Partners under different funding mechanism operating in almost the same geographical area. This led to duplication of services and resources. With rationalisation of IPs, where IP realigned their operations, this minimised duplications.

d) **Change in treatment regimens:** The change from AZT based first-line ART regimens to TLE in 2016, and then to TLD, and paediatric regimen optimisation with phasing out of NNRTI for adults and children ART regimens, and expansion of third-line ART program to RRH in 2018/19 led to improvements in quality of ART services benefitting both adherence and ultimately service uptake. The changes in and optimisation of the regiments also saw prices drops from PI (US\$ 18 /pack) to DTG (US\$ 5/pack) resulting into a net saving of over US\$ 5 million during 2017-2018. These savings were used for procurements of additional health commodities which partly accounted for increased enrolment. The changes in first-line ART regimens saw a cost reduction in procurements as shown below which was re-invested in additional commodities.

Table 6.5: Price changes as a result of the Treatment regimens and Optimisations.

	AZT based	TLE	TLD
Annual costs/Adult patients	US \$124	US \$ 92.3	US 92.2

The combined effect was savings of approximately US\$ 20 million that was reprogrammed, and led to increased programmatic outputs and increased scale up of services with limited initial resources. The adult regimens, dropped from average annual costs from AZT based to TLE based regimens as well as the regimen optimisation in 2018/19 with a net saving of US\$ 18 million, of which US\$ 13.79 million was re-invested in procuring addition supplies, US\$ 5 million for additional ARV for 25,000 clients, US\$ 2 million for prophylaxis for addition 252,000 patients, as well assorted laboratory supplies of US\$ 6 million for patient monitoring. The savings saw the introduction of VL supplies through the Global Fund. A total of US\$ 4

million was reallocated to COVID-19 programming for procurement of the COVID-19 test kits and PPE for the Health workers.

Table 6.6: Health Commodity Saving under the Global fund mechanism 2017-2018

Item description	Proposed Amount	Unit Cost	No treated
Cotrimoxazole	\$ 2,000,000	7.7	259,740
ARVs	\$ 5,000,000	192.8	25,934
POC EID	\$ 1,200,000	37	32,432
Chemistry	\$ 857,167	3	285,722
CD4	\$ 1,000,000	10.5	95,238
Viral load	\$ 2,716,808	16.2	167,704
INH	\$ 1,000,000	7.3	136,986
COVID-19	\$ 4,190,567	40	104,764
PSM	\$ 60,000		
Total	\$ 18,024,542		

6.1.6 Achievements and Challenges in Resource Mobilisation.

The GoU set in place strategies to ensure growth in domestic funding that comprised of:

- Sustained partnership with donor community especially USG, Irish AID, GF,

and UN.

- New partners have been courted for the response including the KOICA.
- To increase the domestic funding, MoFPED directed all MDAs and LGAs to allocate 0.1% of their total budget allocation (excluding pension, gratuity and transfers) to HIV/AIDS. Assessment of HIV/AIDS mainstreaming for FY 2019/20 found that GoU MDAs in total allocated UGX 38 billion towards HIV services within their sectors. This demonstrates that HIV mainstreaming can creatively avail additional domestic resources.
- An inter-ministerial task force on health commodities was set up, with one of its core functions is to mobilise additional funding to the HIV response. It advocates for optimal allocation and monitoring of allocated resources.
- The National AIDS Spending Assessment exercise was rolled out across the country. This provided guidance on resource allocations and utilisation across the thematic and geographical as well as focussing on areas with higher proportions of disease burden.
- The AIDS Trust Fund (ATF) regulations were approved by Parliament – operationalization of the fund awaits certificate of financial implication by MOFPED.
- The private sector has spearheaded the one-dollar initiative for additional funds for HIV/AIDS. The initiative is a funding mechanism to leverage on the business community in the country to support the HIV response. Though still new, it has mobilised approximately UGX 319,893,510 (US\$ 86,457) in cash, UGX 679,000,000 (US\$183,513) in-kind contribution. This basket funding is projected to raises approximately UGX 16 billion (US\$ 4.4 million) over five-years which is estimated to account for 0.11 % of the US\$ 4.1 billion resource need for the HIV response in next five years.

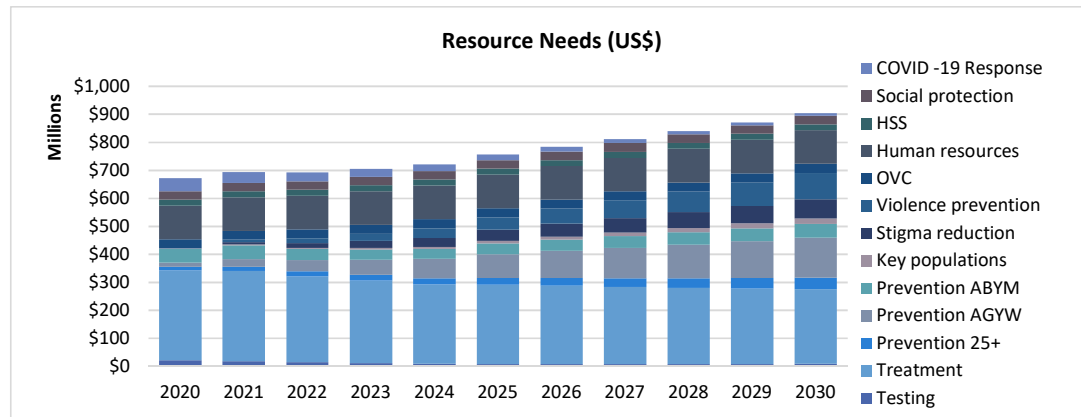
6.2 Resource Estimates for the Revised HIV Investment Case

The costs for the HIV Investments case 2021-2030 were estimated based on Goals model projections and AIM in Spectrum. Several implementation scenarios were considered to guide selection of program targets for maximum impact and the resources required, section 5. The financial implications of the various scenarios have been considered in Chapter 5. The constant coverage scenario would require a total of US\$ 6.28 billion over 10 years.

The prioritized scale-up scenario that was eventually adopted has been presented in Chapter 5. This scenario envisions rapid scale-up to maximum feasible coverage of a comprehensive set of services. The critical interventions for impact are testing, treatment, condoms, SMC,

PMTCT, EID and programs for key populations. These all have proven effectiveness. Other programs (SBCC, AGYW, stigma, violence) are enablers that may influence the uptake of key services and may provide non-HIV benefits but their impact on HIV is not as well documented. The costs for this scenario are estimated at US \$ 8.375bn over the ten years.

Figure 6.5 Resources estimates for the HIV response under the Prioritised Scenario.



Under this scenario, HIV treatment has already reached high levels of coverage. This scenario assumes that it increases to reach 90% coverage of all PLHIV by 2025 and to 95% by 2030. Testing percent of the population that needs to be tested each year will actually decline once high knowledge of status is reached. The program can shift to focus on finding those newly infected with target approaches such as index partner testing, risk assessment for provider-initiated testing, and expansion of self-testing.

Social enablers are key in the success of the HIV response. They are however not specifically attributes in the HIV only. They cut across various sectors. GoU will proactively ensure these are financed through the wide social economic programs. Poverty eradication programs under the Office of the Prime minister, Youth empowerments program under the MGLSD, as well as the AGYM and ABYM program under the Ministry of education will need to be coordinated to ensure synergetic effect are extended to HIV programming. Other areas for consideration include the financing from tourism sector in area with tourism activities.

6.3 Financing of the HIV Investment Case Framework

The National AIDS Trust Fund and other domestic initiatives such as the One Dollar Initiative once operation are potential areas for additional domestic resource mobilisation. These were established to: a) to mobilize resources for the HIV response, and, b) to disburse funds and monitor utilization according to the national priorities. The ATF proposed modest tax on (a)direct incomes (including income and profits, corporate tax, With Holding Tax on goods and services, and bank interest), (b)services (phones/internet, air tickets, and, (c) manufactured goods (beers, soft drinks and cigarettes). This is expected to rise annually US \$100-250m¹²⁸.

Other initiatives to be considered include the National Health Insurance Scheme (NHIS)¹²⁹ –

The NHIS is proposed to operate concurrently with community and private health insurance schemes as a pooled financial risk mechanism. Funds from the NHIS would directly support access to clinical services associated with AIDS-related conditions and for treatment of STIs.

¹²⁸ Uganda Investment case situation analysis

¹²⁹ Ministry of Health (2007). The National Health Insurance Bill.

Access to eMTCT and treatment of other conditions such as malaria that adversely affects PLHIV would also improve. The preliminary projection for NHIS are shown in table 6.6.

Table: 6.6 Anticipated Revenues from National Health Insurance Scheme

Source of Funds /Projected Expenditure	Ugx Billions			
Financial Year	Year 1	Year 2	Year 3	Year 4
GoU Employer Contribution (1%)	27.10	28.80	30.50	32.40
GoU Employee Contribution (4%)	108.5	115.1	122.06	129.451
Private Employers Contributions (1%)	422.832	479.575	543.935	616.931
Private Employees Contributions (4%)	1,691	1,918.30	2,175.74	2,467.72
Pensioners Contribution (1%)	0.027	0.028	0.031	0.032
Self Employed enrolling 20% annually each contributing Shs.100,000/=	129.654	272.273	428.831	600.363
Enrolling 10% Indigents annually	0	0	0	0
Projected Total Revenue	2,379.44	2,814.08	3,301.10	3,846.90
Medical Expenditure	1,935.93	2,274.68	2,737.17	3,512.48
Administration Cost (2% of Revenue)	47.59	56.281	66.022	76.937
Projected total expenditure	1983.522	2330.962	2803.193	3589.416
Estimates share for the HIV response**	337.1987	396.2635	476.5428	610.2007
US Dollar Equivalents in Millions	92.38	108.57	130.56	167.18

** Estimates based on the NHA share of HIV on overall Health spending

6.4 Finance Gap Analysis

The HIV investment case framework will require approximately US\$ 8.2 billion with resources increasing from US\$ 668m million in the first year to US\$ 894 million in the last year. Table 6.7 below shows projected commitments matched with the resources estimates and the resulting funding gaps, over a five-year period. These are based on the assumption of current implementation modalities where resources from donors have been levelled across the period.

Table 6.7: Total commitment and funding gap:

	2020/21	2021/22	2022/23	2023/24	2024/25	Totals
	US \$ Millions					
IC Annual estimates	699.44	710.69	736.51	769.26	822.85	3,738.75
Projected Commitments						
GoU	82.00	86.10	90.41	94.93	99.67	453.10
Development Partners						
The USG	398.00	410.00	410.00	410.00	410.00	2,038.00
Global Fund for ATM	101.00	93.00	83.00	83.00	83.00	443.00
DFID						-
UN Agencies	12.50	12.50	12.50	12.50	12.50	62.50
CHAI	2.24	2.24	2.24	2.24	2.24	11.18
KOICA						
JICA						
Research funds	11.60	11.60	11.60	11.60	11.60	58.00
Total Commitments	607.34	615.44	609.74	614.26	619.01	3,065.78
Funding gap	92.11	95.26	126.77	155.00	203.84	672.97

Conclusions and Way Forward:

The HIV investment case analysis has highlighted the progress so far made towards HIV epidemic control impact targets for SGD 3.3 of ending AIDS by 2030, and also documented the current magnitude and dynamics of the HIV epidemic, and the current coverage and effectiveness of HIV services in Uganda. It has also charted out a cost effective package to meeting the SDG targets based on priority evidence based HIV services brought to scale during the next decade. The critical interventions for impact for the next decade comprise of HIV testing, treatment, condoms, safe male circumcision, PMTCT, EID, and programmes for key and priority populations. Other programmes (SBCC, AGYW, stigma and violence prevention) are enablers that are critical for uptake of these key services and may have benefits beyond HIV control. Achieving the targets in this package is projected to avert up to 130,000 new HIV infections and 51,000 AIDS-related deaths over the decade. This package will cost approximately US\$ 8.2 billion over a ten year period, of which approximately US\$ 1.7 billion is incremental costs to current spending levels. Favourable returns on investment of approximately 5.6 are projected when the costs of treatment averted through averting new HIV infections and productivity gains of a more health population are taken into account. The package presents a compelling case for the additional investment over the decade especially given Uganda's favourable macro-economic outlook.

The epidemic analysis undertaken as part of the investment case highlighted that new HIV infections and AIDS-related mortality dropped substantially over the decade by 52% and 60% respectively, and vertical infections also declined to approximately 5,600 in 2019. However, despite this progress, Uganda came short of the SDG impact targets for 2020, and the HIV epidemic remains severe, generalised, and heterogeneous across geographical, socio-economic and demographic subgroups. Indeed, the HIV burden is still expanding as epidemic control is yet to be attained. Achieving and sustaining HIV epidemic control in the next decade is contingent on bringing to scale priority evidence proven HIV prevention and treatment services augmented by focus on priority population groups.

This analysis also highlighted opportunities for focus in order to end the HIV epidemic during the decade. First the persistent high HIV incidence among key and priority population groups that was found in some instances to be up to ten-fold that of the general population in Uganda. The KP and PP groups include sex workers and their clients, MSM, transgender, fisher folk, incarcerated populations, etc. Despite the small population sizes of these groups, the associated high HIV incidence and sexual mixing patterns potentially threatens attainment of the HIV epidemic control goals. Scaling up and sustaining tailored services for these groups constitute a compelling priority for the next decade in this investment framework.

Secondly, the synthesis highlights the disproportionate HIV incidence among adults working in entertainment, recreation and leisure venues in urban and peri-urban hotspots. This includes workers in bars and lodges, massage parlours and "health clubs", discotheques, restaurants, etc, whose HIV incidence was similar to that among KPs and PPs. We lack data on the HIV testing and treatment cascade, VLS, and sexual behaviour of this group whose population size is likely to be big. However, it is likely that this group is at the risk of *being left behind* and risk maintaining the HIV epidemic. This makes a case for increased attention to this group; service delivery programmes for KPs and PPs should integrate this group and also closely monitor its HIV burden and service uptake and the HIV testing and treatment cascade.

Increased focus on adolescent girls and young women is compelling because they account for a high number of new HIV infections, partly on account of their big population, vulnerability

to high risk behaviour especially with older men, and high HIV incidence. Specific interventions for this group should include tailored services like DREAMS that pay attention to their unique needs and circumstances. This investment case analysis projects that up to 43,000 new HIV infections could be averted during the decade in this age group.

There is paucity of HIV epidemiological data on some population groups that likely have high HIV burden. These groups include long-distance truck drivers, refugees, fishing communities, the military, migrant workers, miners, etc. Recent data on the HIV testing and treatment cascade for these groups was also not available. HIV surveillance and programme monitoring needs strengthening to provide comprehensive up-to-date data on these groups to aide planning and programme monitoring as part of HIV epidemic control efforts for the next decade.

The increasing HIV burden among older people aged over 50 years currently estimated at 17% of PLHIVs, has already surpassed that among young people aged 15 – 24 years. It is projected to grow to 25% by 2025 and 41% by 2030. The management of HIV among older individuals during the decade should integrate management of co-morbidities especially non communicable diseases. This makes a compelling case for strengthening linkages with programmes for NCDs like cardiovascular, diabetes, degenerative, mental illness, etc.

The limited progress of the national response with behavioural interventions and some primary prevention services like male circumcision during the decade was highlighted. Achieving the SDG goals is contingent on progress with these services. We noted low levels and declining trends of preventive sexual behaviour, with apparent increase in risk taking behaviour in recent years. For instance, casual sex among men and women appears to have increased, while condom use during such encounters was low and appears to have declined. Multiple partnerships are still frequent especially among men with low levels of condom use. Youth sexual behaviour especially early sexual debut has also not changed much during the decade. Behavioural interventions and other primary prevention measures remain important because even if the triple 90s or 95s cascade were achieved, there would still remain substantial numbers of HIV-infected individuals with unsuppressed vireamia to continue transmission. The SBCC interventions in the prioritised package under this framework makes a case for innovative approaches to address the gaps in sexual behaviour and underlying structural drivers.

There was tremendous progress with HIV testing and treatment during the past decade, achieving significantly knowledge of HIV serological status among PLHIV, linkage and adherence to treatment, and ultimately VLS. However, men and children were lagging behind in the HIV testing and treatment cascade. We have limited age and geographical disaggregated data that appears to highlight that young people and adolescent have disproportionately more undiagnosed infections, low treatment coverage, and high unsuppressed viremia. In addition, data on HIV testing and treatment cascades for high-risk groups were not available but need to be routinely monitored as part of the enhanced surveillance in order to adequately inform HIV epidemic control. This makes a compelling case for enhanced case finding, linkage, retention in care, and adherence to treatment especially for men, adolescents and children.

Uganda has also made substantial progress with its PMTCT, however, with over 5,600 vertical infection in 2019, virtual elimination of MTCT is not yet in sight. The sources of the remaining vertical infections include women dropping off ART during pregnancy or breast feeding, and incident HIV during pregnancy or breast feeding, and perhaps vertical infection among children of women who don't attend ANC. These patterns of vertical infections makes a compelling case for more investment in PMTCT four-pronged strategy that include FP for HIV-infected women, prevention of HIV among women of reproductive age, enhanced case finding, ART

linkage, adherence and retention of HIV-infected pregnant and breast feeding women. These could be complemented by PrEP for pregnant and lactating women¹³⁰. The Uganda PMTCT elimination plan already takes these dynamics into account.

Uganda's mature HIV treatment programme already manifests HIVDR, AHD, and comorbidities. Weak health facility practices increasing risk of HIVDR include low retention on first-line ART, low on-time ARV pick up, low VLS among some groups, low viral load testing coverage, and ARV stock outs. There are already high levels of HIVDR mutations to NRTIs and NNRTIs among individuals on treatment and naïve recently infected individuals. The high prevalence of HIVDR among individuals with virological failure makes a compelling case for review of the policy of three intensive adherence counselling (IAC) sessions followed by repeat VL test preceding the switch to second-line treatment. Recent HIV treatment guideline updates already took the patterns of HIVDR findings into account. There is also a compelling case for increased focus on the weak health facility practices that pose a risk of emergence of HIVDR in the context of CQI projects at facility level.

Both the NSP 2020/21-2024/25, HSHASP 2017/18-2022/23 and the UNAIDS' Prevention 2020 Road Map provide the basis for scaling up HIV programmes as part of Fast-Tracking a comprehensive response to meet global and national targets by 2030¹³¹. We have defined a priority package of interventions to meet this requirement during the next decade. The programme implementation analysis has noted that while some HIV combination prevention interventions have attained high coverage, others remain unacceptably low. For instance, although PrEP in principle is currently being rolled out nationally, it is only provided at a few health facilities. Low EID coverage among HIV exposed infants leads to poor linkage to treatment for the infected infants as mothers are lost to follow up. Coverage of social support interventions is also low. HTS for adults have reached high coverage levels (~90%), while SMC have low coverage (estimated at 63%). In view of above, efforts should be taken to scale up the identified evidence-based, cost-effective and impactful interventions identified in the "prioritised package" in this framework, hinging on best practices. Furthermore, sustainability of the achievements for interventions already at optimal coverage is critical.

The UNAIDS' Prevention 2020 Road Map notes that two approaches for programme design are critical, namely: i) A targeted approach considering geographical location and population to address the heterogeneity of the HIV epidemic; and ii) A people-centred approach that responds to the different needs of people at risk and their communities. To reach "the last mile", systems need to focus on clients instead of systems. The analysis identified that the following strategies have worked well in Uganda: i) Integration of HIV prevention and treatment into core health services, including SRH, TB and the broader health services; has led to better access and uptake of services; ii) DSDM that took into consideration that not all clients have the same needs, reached more clients; iii) The differentiated ART delivery approach is reported to have eased on the burden of PLHIV to reach clinics; iv) high level political commitment and leadership, and multi-sectoral approach that engages CSOs and the private sector, have enhanced the effectiveness of HIV programmes; v) Enabling policies such as the "Test and Treat" led to a rapid scale up of HTS and ART initiation leading to good performance in the 90-90-90s; vi) Targeted testing has enhanced progress in HTS; vii) Engagement of NGOs in delivering ART has led to better reach of communities in remote parts; viii) Optimization of longer term / MMD of ARVs especially during the COVID-19 lockdown has been helpful; ix)

¹³⁰ World Health Organisation: Preventing HIV During Pregnancy and Breast Feeding in the Context of PrEP: Technical Brief, WHO, Geneva, Switzerland, July 2017

¹³¹ UNAIDS: The Prevention 2020 Road Map.

Use of digital technology in HIV service delivery especially during COVID-19 pandemic to share information among service providers, referral of clients to HIV services, follow up of clients in the community, and enhancing ARV drug refills; x) Rationalization of HIV programmes at regional levels with one IP designated to support one health regions has enhanced efficiency and accountability; xi) Engagement of peers and community support groups to extend services to KP/PP. These best practices should be scaled up during the decade.

The HIV programme coverage also vary by region, age, sex and population sectors. Therefore, attention should be given to providing differentiated HIV prevention packages to specific target groups. There is need for disaggregated data by age, sex, gender and other characteristics to facilitate planning for services at granular level. Furthermore, allocation of resources should be guided by the magnitude of the problem. Uganda should put the money where its mouth is. The analysis highlights little scope for geographical targeting of services in Uganda. HIV treatment should be provided everywhere there are PLHIV. However, where resources are constrained, HIV prevention services could be focussed on high HIV incidence districts.

The role of a multi-sectoral approach and collaboration through public-private-partnership in the national response need to be strengthened to enable partners to contribute based on their comparative advantages. Specifically, strengthen the national response coordination mechanisms, the health systems, as well as the social and financial protection systems. The MOGLSD has a central role in building community level structures for reaching cultural leaders and community networks of PLHIV to spread HIV/AIDS awareness, reduce stigma and address GBV. Community systems strengthening helps in generating demand for HIV/AIDS services, facilitates access and expands the coverage of community-based programmes. It also helps facilitate, as far as possible, transitions of community-based programmes from donor to domestic funding and achieving the 2016 Political Declaration target to “ensure that 30% of service delivery is community-led” (UNAIDS).

Lessons learnt from the ongoing Covid-19 pandemic highlight the need for building resilient systems. The Covid-19 found a weak public health system that was unable to sustain service delivery under prolonged pressure. Due to this, health services in general and HIV services in particular were negatively impacted. In recognition of the need to put in place mechanisms to address this, UNAIDS in its press statement noted that as “the world undertakes focused efforts to slow the spread of COVID-19, it must also redouble efforts to limit any interruption and promote rapid recovery of HIV-related services, including ensuring uninterrupted supplies of essential commodities and technologies for HIV and other global health priorities”¹³².

Although the national response attracted significant resources from domestic and external partners during the decade, the total resource envelope fell short of requirements and funding gaps remained. This may have hindered attainment of programme targets.

The prioritised scale up scenario stands to see reduced spending on HIV treatment in the future since the numbers in need of treatment will begin to fall mid-decade and will be 6% less by end of the decade than if coverage of the services constant 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 spending now.

The investment case analysis makes it imperative for GoU and its partners will have to consider strategies for funding the HIV response to meet the targets for the decade. The

¹³² UNAIDS. PRESS RELEASE: HIV and COVID-19: a unique moment in time to learn, leverage and build resilient systems for health.

first strategy is to maintain current funding levels from both domestic and external sources. Now is not yet the time for any of the current funding sources to contemplate reduction in funding. Secondly, there is need to mobilise additional resources from both domestic and external sources. In line with this, it is imperative for the GoU to consider significant increase in its on budget support for health and HIV services, to at least to meet the Abuja targets. This is even more compelling now as Uganda approaches attainment of lower middle income status, which comes with more limited external donor financing. The Government also needs to actualise other innovative sources of domestic funding, including operationalisation of the National Health Insurance Scheme (NHIS), the National AIDS Trust (NATF), the one-Dollar Initiative, etc. Although Government has prioritised the impending oil revenues largely to infrastructure development, funding of HIV services also makes a compelling case. There should also be a government strategy for mobilisation of additional resources from its current bilateral and multilateral external funding partners especially the US Government, the Global Fund, Irish AID, etc. This could be reinforced with soliciting funding from other multilateral and bilateral partners including the World Bank, African Development Bank, etc. This HIV investment case framework should support these initiatives.

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

Increasingly integrate HIV services within the broader health systems. This will entail developing multipurpose service delivery points at a facility or in the community to provide a range of services, often extended by the same provider. It is often associated with better programme outcomes and impact and leverages synergies and enhances service delivery quality and efficiency.

Strengthen the financial and risk management systems. The objective is to have strong and effective HIV programme delivery systems¹³³. Investments in financial management and health financing will improve coverage of HIV services in an equitable manner without exposing the population to financial hardship.

In conclusion, this HIV investment framework highlights the progress made with HIV epidemic control during the past decade, and the main gaps that remain. It identifies a prioritised package for investment focusing on the general and priority population groups. Priorities include addressing the persisting high HIV incidence especially among key and priority populations, AGYW, people in incarceration, and the increasing burden of HIV in older populations with likely comorbidities. Behavioural interventions should focus on sexual behaviours such as casual sex, multiple partnerships, early sexual debut among young people, and the prevailing low levels of condom use. Furthermore HIV treatment programmes should pay increased focus on men and children that are still lagging behind in the HIV testing and treatment cascade through tailored case finding, ART linkage, adherence and retention.

¹³³ The Global Fund. The Role of the Global Fund Supporting Countries to Build Resilient and Sustainable Systems for Health. December 2015 Geneva, Switzerland.

Annex 1: Summary of key recommendations for specific HIV interventions

Intervention	Delivery approaches	Recommendations
Social behaviour change communication (SBCC)	Multi-channel approaches (interpersonal communication, youth-focused, community dialogue and interactive social media programmes).	Scale up SBCC interventions to promote risk-avoidance, behaviour change and access to and the uptake of combination HIV prevention interventions. Address the gap of lack of comprehensive HIV knowledge. Young people should be targeted; they need to acquire and maintain high HIV knowledge and good attitudes, as well as be empowered with skills to help them foster positive behaviour change.
Condom promotion and distribution	Total market approach targeting special groups. People-centred to reach clients where or near where they live in line with the concept of last mile delivery.	Demand creation and data driven approach in service delivery. Targeted condom promotion and distribution with a focus on higher risk populations (PLHIV, key populations, priority populations and people in discordant relationships). Address the age, urban/rural divide and regional disparities in condom use as well as challenges with morality-related impediment to condom warehousing.
Safe male circumcision	Most cost-effective to target the sexually active and higher risk groups. Targeting infants has no immediate benefit.	Scale up SMC targeting adolescents, young men, adult males and key populations with the aim of reaching at least 80% of men aged 15-29 years. Address rural/urban disparity in SMC coverage.
Anti-retroviral treatment	People-centred approaches; and Test & Treat strategy are most cost-effective.	Scale up ART to reach 95% coverage level to achieve high population level viral suppression. Optimize retention and adherence to ART.
HIV testing counselling	DSDMs such as Assisted Partner Notification, Index client testing, HIV self-testing (HST) and Provider-Initiated Counselling and Testing (PICT) are most effective.	Scale up HTC to diagnose new cases while addressing the urban/rural divide disparities. Target key and priority populations.
Elimination of mother to child HIV transmission (eMTCT)	DSDMs and Mother/Baby retention models for PMTCT. Also, integrated service delivery approaches.	Scale up eMTCT 4-pronged services using effective approaches to attain high programme coverage and impact. Strengthen paediatric HIV testing. Integrate HIV services within the Maternal, New born and Child Health (MNCH). Integrate Nutrition Assessment Counselling and Support (NACS) services in PMTCT.
Pre-Exposure Prophylaxis (PrEP)	Targeting all PLHIV in serologically discordant relationships.	Cognizant that currently over three quarters of the districts remain without PrEP services, scale up PrEP services to cover all districts while addressing stigma and discrimination.
Post Exposure Prophylaxis (PEP)	Targeting high risk groups. Effective when administered within 72 hours of exposure.	Scale up PEP services. The PEP guidelines should be reviewed, updated and rolled out to improve the quality of services.
HIV prevention services for Adolescent girls and young women (AGYW)	Youth-friendly approaches, empowerment with life skills and HTC with effective linkage to care and retention.	Scale up SBCC to promote HIV risk avoidance and promote uptake of the interventions among AGYW. Promote combination HIV prevention services among AGYW, including; SBCC, HTC, condom distribution and use, ART and sexual and reproductive health services (SRHS).
Cotrimoxazole prophylaxis	Targeted approach for newly diagnosed HIV clients who are not able to access ARVs.	Cotrimoxazole prophylaxis should no longer be a top priority intervention for HIV prevention and control. It should only be implemented in a targeted approach for

Intervention	Delivery approaches	Recommendations
Isoniazid preventive treatment (IPT)	Targeting PLHIV with TB coinfection.	newly diagnosed HIV clients who are not able to access ARVs. Given the high rate of HIV and TB comorbidity, IPT will remain relevant. But, for it to have the desired impact, its implementation should be scaled up to address the current sub-optimal coverage of 51%.
TB/HIV Collaborative Activities	An integrated approach that ensures a 'One-stop-centre' model for TB/HIV care.	Investment to enable continued routine screening for TB among PLHIV, INH prophylaxis among PLHIV and screening for HIV among all TB patients.
Control of sexually transmitted diseases (STDs)	Integrated approach of service delivery at health facilities.	Scale up screening for STDs, management of STDs, surveillance of HIV among STD patients through HTC, surveillance of STIs among women attending ANCs, as well as monitoring of STD drug resistance. Revise treatment algorithm.
HIV Prevention Among Key/Priority Populations	Targeted approaches using peers and key population networks.	Continued investment in combination HIV prevention services targeting key/priority populations; the group has high HIV incidence. Tailored package of services for most at risk and key populations, linking them to services and follow up. Moonlighting. Increasing investment for harm reduction interventions. For PWIDs, accelerate access to harm reduction interventions and roll out medically assisted therapy and overdose management services, as well as address barriers that impede access to health care services.
Structural interventions	Targeting vulnerable groups.	Increase school enrolment of girls and enhance their retention in schools, gender empowerment and economic empowerment women.
System strengthening	Multi-level and multi-sectoral approach of system strengthening.	Developing resilient systems, including; addressing the inadequate domestic financing; inadequate equipment maintenance, quality control and quality assurance; insufficient numbers of skilled human resources; insecurity of commodities for HIV programmes and the associated stock-outs; as well as lack of a unique identifier in the health system. Strengthen decentralization of services.
Research	Multi-disciplinary	Developing a national HIV research agenda. Continued research on HIV prevention, care and treatment. Implementation science research to determine better approaches to deliver proven cost-effective interventions. Collection of and optimization of use of granular data to focus interventions so as to realize maximum impact.