



TECHNICAL REPORT

Assessment of Quality of Integrated Reproductive, Maternal, Newborn, Child, and Adolescent Health and HIV Care in Uganda and Kenya

MAY 2020

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Nancy Fronczak, University Research Co., LLC

Tamar Chitashvili, University Research Co., LLC (Principal Investigator)

Ekaterine Cherkezishvili, University Research Co., LLC

Peter Mutanda, University Research Co., LLC (Co-Principal Investigator)

Gorrette Nalwadda, University Research Co., LLC (Co-Principal Investigator)

Sarah Kauder, University Research Co., LLC

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Acronyms

| | |
|---------------|--|
| AIDS | Acquired immunodeficiency syndrome |
| ANC | Antenatal care |
| ART | Antiretroviral therapy |
| ARV | Antiretroviral |
| ASSIST | USAID Applying Science to Strengthen and Improve Systems Project |
| AZT | Zidovudine |
| CD4 | Cluster of differentiation |
| CO | Clinical Officer |
| DHS | Demographic and Health Survey |
| DNA | Deoxyribonucleic acid |
| DREAMS | Determined, Resilient, Empowered, AIDS-free, Mentored, and Safe |
| EID | Early infant diagnosis |
| ELISA | Enzyme-linked immunosorbent assay |
| eMTCT | Elimination of mother-to-child transmission |
| FP | Family planning |
| FY | Fiscal year |
| HAART | Highly active antiretroviral therapy (combined three-drug therapy) |
| HIV | Human immunodeficiency virus |
| LAM | Lactational amenorrhea |
| L&D | Labor and delivery |
| MCSP | Maternal Child Survival Program |
| MO | Medical Officer |
| NASCOP | National AIDS and STI Control Programme (Kenya) |
| NVP | Nevirapine |
| OHA | USAID Office of HIV/AIDS |
| PCR (for HIV) | Polymerase Chain Reaction (blood test for DNA for HIV) |
| PCMD | Preventing Child and Maternal Deaths |
| PEPFAR | U.S. President's Emergency Plan for AIDS Relief |
| PHIA | Population-based HIV impact assessment |
| PMTCT | Prevention of mother-to-child transmission |
| PrEP | Pre-exposure prophylaxis |
| QI | Quality improvement |
| QoC | Quality of care |
| RN | Registered nurse |
| RMNCAH | Reproductive, maternal, newborn, child, and adolescent health |
| SARA | Service Availability and Readiness Assessment |
| SID | HIV/AIDS Sustainability Index and Dashboard |
| SIMS | Site Improvement through Monitoring System |
| SPA | Service Provision Assessment |
| STI | Sexually transmitted infection |
| TDF/3TC/EFV | Tenofovir+Lamivudine+Efavirenz |
| TB | Tuberculosis |
| USAID | United States Agency for International Development |
| VLS | Viral load suppression |
| WHO | World Health Organization |

ABSTRACT

Background and Methods

The USAID Office of Health Systems and USAID Office of HIV/AIDS (OHA) in Washington tasked the USAID Applying Science to Strengthen and Improve Systems (ASSIST) Project team to develop a survey toolkit for assessing the quality of care of integrated reproductive, maternal, newborn, child, and adolescent health (RMNCAH) and HIV services and to test the tools in two to three priority Preventing Child and Maternal Deaths (PCMD) countries also supported by the U.S. President's Emergency Plan for AIDS Relief (PEPFAR), since existing facility-based tools did not provide the information necessary for this type of assessment. Uganda and Kenya were identified as two of three countries in the world with the largest HIV epidemics. Both have adopted the main World Health Organization (WHO) recommended policies for integrated HIV services and for services for prevention of mother-to-child transmission of HIV (PMTCT). The assessment of HIV services focused on quality of integrated RMNCAH and HIV services, including the quality and continuity of life-long HIV treatment among HIV-positive patients.

In 2017-2018, the survey toolkit was developed, and the tools tested and implemented in 10 selected facilities in Uganda and 11 facilities in Kenya. Selection criteria included: PEPFAR/USAID-supported districts or counties, suggested by USAID field team, facilities with no on-going external quality improvement (QI) intervention in maternal or RMNCAH services; high volume and/or high maternal and under five mortality facilities; facilities representing all levels of the health service delivery system that provide RMNCAH and HIV services within each selected district and are connected with referral linkages; and facilities where a similar assessment had not been recently performed.

Information related to the assessed services was gathered from: a) self-administered questionnaires for service providers; b) retrospective reviews of individual patient records; c) observation of services being provided for the maternal and newborn care process with supplementation of information for observed patients from their patient chart/card; d) interviews with clients; and e) key informant interviews with managers/providers and observations to verify reported response about facility-level key inputs (e.g., drugs, diagnostics) and supporting systems for quality of RMNCAH and HIV care.

Findings

It should be noted that comparisons of results between countries in this report are used only to provide pictures of different levels of existing practices. Differences should not be used to imply that services in one country are better than in the other, as the facility sample was not selected to be representative of the country.

- Evidence of HIV testing at least once during antenatal care (ANC) is widespread, but recording of the test result is not consistent, particularly in Kenya.
- Almost all interviewed clients (99% Uganda and 97% Kenya) reported they had received an HIV test during their pregnancy with most (87%) Kenyan women admitted for labor and delivery (L&D) knowing their HIV status on admission (this was not assessed for Ugandan women). According to national Demographic and Health Survey (DHS) findings, the proportion of pregnant women who had HIV testing during ANC and labor are higher in Kenya than in Uganda (Kenya DHS, 2014).
- HIV-positive ANC clients are universally placed on antiretrovirals (ARV)—and the national protocol for both Uganda and Kenya is the three-drug regimen. Evidence of clinical follow-up, including laboratory results, for women on life-long antiretroviral therapy (ART) was weak. High coverage of ART was also confirmed by population-based HIV impact assessments (PHIA) in both countries (95.3% in Uganda and 92.1% in Kenya) (Uganda MOH 2019, Kenya Ministry of Health 2020).

- Retesting of women three months after an initial HIV negative test during ANC, including at admission for L&D (policy for both countries) is not consistently practiced, with Uganda retesting at higher levels than Kenya. Dates of tests to identify eligibility for retest during L&D were missing for substantial percentages of patients.
- Assessing HIV status for partners of pregnant women was weak (recorded for 32% in Uganda and 11% in Kenya), and counseling about pre-exposure prophylaxis (PrEP) for persons at risk (assessed in Kenya) was not practiced, although provision of PrEP is policy and drugs were available. Considering lower overall testing rates among the adult male population, enhanced partner testing could be an important strategy to close the gender gap in HIV testing (Kenya DHS 2014, Uganda DHS 2016).
- Documented evidence of provision of ARV for exposed infants was universal in Uganda (95%) and weaker in Kenya (80%). However, when adjusting parent reports with ARVs detected in the blood, only 56.3% of children diagnosed with HIV in Uganda had been previously diagnosed and more than half of HIV-positive children (54.3%) were not on ART, according to the Uganda PHIA, 2016-2017 (Uganda MOH 2019), suggesting that the 90-90-90 cascade is the weakest among children, both in Uganda and Kenya (Uganda MOH 2019, Kenya MOH 2020).

Evidence of routine screening of infants, older children, and adolescents for risk, familial exposure to HIV, or symptoms that might indicate HIV infection was not found. This contributed to the percentage of women arriving for ANC and L&D who did not know their HIV status—that is, they had likely never been tested during prior contacts with health services, as would be expected with integrated HIV services. Nationally representative surveys in Uganda and Kenya also show limited HIV testing, knowledge of their status, and comprehensive knowledge on HIV among these target populations (Uganda MOH 2019, Kenya MOH 2020), suggesting the need for enhanced efforts to improve testing, counseling, and treatment follow-up to achieve and sustain HIV-related national and global goals.

Conclusions

The developed tools are appropriate and feasible to implement and provide more in-depth assessment of the quality of care for RMNCAH and HIV care, according to the existing global guidance (e.g., WHO's Quality of Care framework for maternal, newborn, and child health). The modular approach allows focused assessment in specific clinical area of interest (e.g., antenatal care). By using information from a variety of sources, the assessment tools help the triangulation of results.

The results from this study are consistent with documented nationally representative information on HIV service availability and coverage for Uganda and Kenya.

- Core PMTCT functions are quite good but weaknesses exist in re-testing negative women to ensure that providers are acting on current HIV status at delivery and postpartum, as per guidelines.
- Integration between PMTCT and ongoing HIV care seems poor, with evidence of weak clinical follow-up for women on life-long ART.
- Integration of HIV services into maternal, newborn, and child health programs other than PMTCT is very weak, with various data collection methods showing almost no screening of sick infants and young children for risk of HIV and limited use of visits by mothers of sick children or adolescents as an opportunity to assess HIV status, although these services were more consistently observed in Kenya than in Uganda.

EXECUTIVE SUMMARY

Objectives and methods

The USAID Office of Health Systems and USAID Office of HIV/AIDS (OHA) in Washington tasked the USAID Applying Science to Strengthen and Improve Systems (ASSIST) Project team to develop a survey toolkit for assessing the quality of integrated reproductive, maternal, newborn, child, and adolescent health (RMNCAH), including HIV services for pregnant women, exposed infants, sick children, and adolescents, and to test the tools in two to three priority Preventing Child and Maternal Death (PCMD) countries also supported by the U.S. President's Emergency Plan for AIDS Relief (PEPFAR), since existing facility-based tools did not provide the information necessary for this type of assessment. Uganda and Kenya were identified as two of three countries in the world with the largest HIV epidemics. Both have adopted the main World Health Organization (WHO) recommended policies for integrated HIV services and for services for prevention of mother-to-child transmission of HIV (PMTCT).

In 2017-2018, the survey toolkit was developed, and the tools tested and implemented in 10 selected facilities in Uganda and 11 facilities in Kenya. Selection criteria included: PEPFAR/USAID-supported districts or counties, suggested by USAID field team, facilities with no ongoing external quality improvement (QI) intervention in RMNCAH services; high volume and/or high maternal and under five mortality facilities; facilities representing all levels of the health service delivery system that provide RMNCAH and HIV services within each selected district and are connected with referral linkages; and facilities where a similar assessment had not been recently performed. Data for this study were collected in the period May 2017-February 2018. The majority (80%) of sample facilities in Uganda were health center level (38% Level 3 and 62% Level 4), while the majority in Kenya were hospital level (73%).

This assessment was part of a larger assessment of RMNCAH services, with the HIV focus on integration of RMNCAH and HIV services. Kenya and Uganda were selected as the assessment countries, being two of three countries with the largest HIV epidemics and having an HIV prevalence among the adult population (15-49 years old) of 4.7% and 5.7%, respectively (UNAIDS 2018a, UNAIDS 2018b). Both countries are PEPFAR priority countries that have adopted the main WHO-recommended policies and clinical recommendations for integrated HIV services and for services for PMTCT. Additionally, both countries have adopted the WHO recommendations that HIV-negative pregnant women be retested every three months after a negative test until after delivery, and periodically (with the frequency depending on risk factors) during breastfeeding.

The scope of the study included availability and provision of services as well as availability of trained staff, guidelines, and patient follow-up systems relevant to:

- 1) Counseling on preventing HIV and other sexually transmitted infections (STIs) as well as HIV testing for case detection among adolescents, caregivers for sick children, and partners of caregivers;
- 2) Case detection and identification of risk for infection during pregnancy, childbirth, and immediate postpartum;
- 3) Services for the exposed infant;
- 4) Assessing the HIV status of the partner of the pregnant woman and pre-exposure prophylaxis (PrEP) services;
- 5) Antiretroviral therapy for the infected mother during pregnancy, delivery, and postnatal care along with counseling on infant feeding, family planning (FP), and interventions for the exposed infant (postnatal and early infant care); and
- 6) Detection of the infected child (child health services).

The assessment did not focus on the quality and continuity of life-long HIV treatment among HIV-positive patients.

Information related to the assessed services was gathered from: a) self-administered questionnaires for service providers about their experience, knowledge, attitudes, and practices; b) retrospective reviews of individual patient records for documentation of patient assessments and the results of these assessments, diagnoses, interventions, and information sharing; c) observation of services being provided for the care process with supplementation of information for observed patients from their patient chart/card; d) interviews with clients about their knowledge, experiences with services, and perceptions of how they were treated; and e) key informant interviews with managers/providers and observations to verify reported response about facility-level key inputs (e.g., drugs, diagnostics) and supporting facility-level systems for patient follow-up. Additional information on facility resources and patient follow-up systems and from record reviews was collected from a subset of Kenyan facilities to provide more details on HIV services.

Findings

It should be noted that comparisons of results between the two countries in this report are used only to provide pictures of different levels of existing practices. Differences should not be used to imply that services in one country are better than in the other, as the facility sample was not selected to be representative of the country.

Across the different data collection methods, it was evident that HIV testing, antiretroviral therapy (ART) for HIV-positive antenatal care (ANC) clients, and preventive antiretrovirals (ARV) for their exposed infants are universally provided services, although there were weaknesses identified in recording of the information, particularly in Kenya.

Current (within the past 12 months) training for HIV screening for PMTCT was low, with 48% (n=160) of Ugandan and 43% (n=161) of Kenyan ANC service providers interviewed reporting training in the past 12 months. Provider responses about their knowledge of HIV and the range of services they reported providing that are relevant to PMTCT were strong, but observation and record review evidence of actual provision of services beyond initial maternal testing and provision of ARV, (e.g., FP, assessing the partner HIV status, and retesting HIV-negative pregnant women), showed gaps, particularly for Kenya.

It was noted in the retrospective ANC record review that 41% (Uganda) and 16% (Kenya) of records indicated the woman did not know her HIV status when she first started ANC. Similarly, a national representative survey from Uganda indicates a need to improve the first 90 target among women of reproductive age, especially among young women or those experiencing their first pregnancy (Uganda MOH 2019).

There were gaps noted in the consistency of providing/documenting the HIV test for ANC clients, particularly for Kenya, where the HIV test result was not documented in 18% (n=82) of retrospectively reviewed ANC records even though five of these women were documented on ART. Among a sample of retrospectively reviewed labor and delivery (L&D) records (for different women than those reviewed for ANC) 92% (Uganda, n=247) and 93% (Kenya, n=262) of the women had an HIV test result recorded at their discharge, however, only 73% (Uganda) and 44% (Kenya) had a current test result documented. (that is, either no test result was recorded, or there was documentation of a negative test but no documentation of a retest within the prior 3 months, as recommended by WHO and national guidelines).

According to a retrospective review of ANC client records, almost all (99%) HIV-positive pregnant Ugandan women were enrolled in the three-drug ART regimen (as per Ugandan protocol) and 94% of the Kenyan were on an ART regimen. Kenya PMTCT protocol is also to provide the three-drug ART regimen, however, recording of the exact ART regimen women were on was unclear. Documentation showed that most of exposed Ugandan infants (97%) received prophylactic ARV, but only 80% of exposed Kenyan infants had this documented. All assessed Kenyan facilities (n=11) and 90% of Ugandan facilities (9 of

10) had the first line three-drug maternal ART regimen available, and 91% (Kenya) had both nevirapine and zidovudine syrup (the first line infant prophylactic regimen for Kenya), while 80% (Uganda) had nevirapine syrup (the first line infant prophylactic regimen for Uganda) for exposed infants available.

Assessment of the HIV status for partners of pregnant women was low (32% Uganda and 11% Kenya), with further analysis showing that assessment of partner HIV status was mostly conducted for the partners of positive women. This means that women who were negative but might be at higher risk of HIV infection from their partner were less likely to be identified. This also means, that considering lower overall testing rates among adult male population, enhanced partner testing could be an important strategy to close the gender gap in HIV testing (Kenya DHS 2014, Uganda DHS 2016).

Evidence from retrospective client record reviews and observation of outpatient care of sick children demonstrated that HIV status and risk of HIV infection from their mothers was rarely assessed when providing care to sick children, despite most child health service providers from both countries reporting that they screen mothers and sick children for risk/symptoms of HIV. During observed sick child (from 2 months to 5 years old) consultations 3% of the Ugandan and 40% of the Kenyan child health care providers asked if the mother had ever had a HIV test, with slightly lower percentages (1% Uganda and 39% Kenya) asking whether the infant had ever had an HIV test. Among the 22 (Uganda) and 68 (Kenya) observed consultations for sick infants (less than two months old) 14% (Uganda) and 54% (Kenya) of the mothers were asked if they had ever had an HIV test with fewer (0% Uganda and 44%,Kenya) observed being asked if their infant had ever had an HIV test. Retrospective reviews of outpatient records for sick children showed that an assessment of HIV status or conducting a HIV test was documented for only 2 of 737 (0%) Ugandan and 3 of 786 (0%) Kenyan children their most recent visit. Recent training and use of guidelines related to HIV and children were reported by only 26% (Uganda) and 27% (Kenya) of child health service providers in each country. Considering that after adjusting parent reports with ARVs detected in blood, only 56.3% of children diagnosed with HIV in Uganda has been previously diagnosed (Uganda MOH 2019), significant improvement has to be made to improve testing of children and complete follow up of HIV-exposed infants (also found to be deficient according to SIMS data from selected study facilities of Kenya).

PrEP was assessed in six Kenyan facilities,¹ where integrated RMNCAH and HIV care was studied in detail per OHA request (details are provided in the background section). PrEP is part of the PMTCT protocol for Kenya, however, provision to /counseling of eligible clients about PrEP was not documented in these six facilities, although the PrEP ARV drugs were available.

Integration of HIV education into services provided to adolescents was also not reported by interviewed adolescents, with only 11% (Uganda) and 15% (Kenya) of those interviewed aware that HIV services were available for adolescents, despite most providers of services for adolescents (57% Uganda and 74% Kenya) reporting that they routinely counsel adolescents about HIV.

Over half (58% of Ugandan and 55% of Kenyan) of providers of L&D services completing questionnaires reported their facility has a system for follow-up of HIV-positive women and their exposed infants. Asked to provide more information about these follow-up systems, most respondents described information sharing processes or described the follow-up services available. Systems for tracking whether patients actually received the services at HIV treatment points and for monitoring a patient across the various services relevant for their care were less widely reported. The most commonly reported tracking systems for patients who were identified as not compliant with referrals or appointments relied on community members, including mentor mothers.

¹ PrEP was not assessed in Uganda.

According to the current WHO recommendations, all HIV-positive ANC clients should receive life-long highly active ART (HAART). Viral load or CD4 (if viral load is not available) are important measures of the effectiveness of ART. Only 3% (Uganda) and 28% (Kenya) of retrospectively reviewed records for HIV-positive ANC clients had a CD4 count recorded, and 0% (Uganda) and 36% (Kenya), a viral load recorded. Laboratory tests for assessing and monitoring clients on ART were available in fewer than half of the six Kenyan facilities where additional information on laboratory tests for HIV services was collected. Additionally, among these six facilities, all had observed guidelines for PMTCT and for clinical management for HIV, but only 67% had guidelines for palliative care.

Counseling for PMTCT was variable with some topics being covered more often than others. The more frequently identified topics were counseling on dual protection using condoms (documented in retrospective ANC record reviews for 80% [Uganda] and 77% [Kenya] of clients) and PMTCT specific subjects (e.g., importance of ART). Topics not identified as priority counseling topics by service providers and not documented/reported in high percentages for clients included FP, infant feeding, and exclusive breastfeeding—although most infants were documented as being exclusively breastfed on discharge.

Interviewed adolescents from both countries were familiar with HIV, and knowledge for where they could get an HIV test was high. Respondents' knowledge of how HIV was transmitted was faulty, however, and they did not report being counseled about HIV testing. Knowledge of condoms was low in Ugandan respondents. Among adolescents who reported they knew about condoms, most were aware that condom use reduces risk from HIV, but knowledge for where they could get condoms was low among Kenyan respondents. The study findings are consistent with nationally representative surveys, indicating low level of comprehensive knowledge on HIV and low testing and counseling practices in this important age group. This suggests the need for age-appropriate sexual and reproductive health education and counseling both in the health and education sectors.

Conclusions

The developed tools are appropriate, feasible to implement and provide more in-depth assessment of the quality of care for RMNCAH, according to the existing global guidance (e.g. WHO's Quality of Care [QoC] framework for maternal, newborn, and child health [MNCH]). The modular approach of the tools allows conducting of a focused assessment in priority clinical areas of interest (e.g., ANC), as needed, with fewer resources. By using information from a variety of sources, the tools allow for triangulation of results and thus provide a deeper understanding of quality of care gaps and their root causes. The tools were found to be adequate for achieving the objective, and with minor revisions to adapt them to specific country context, they will provide an important contribution to the ability to quantify the quality of integrated HIV services with RMNCAH services.

Results from this study are consistent with documented nationally representative information on HIV service availability and coverage.

Core PMTCT functions were strong but weaknesses in documentation of HIV test results and the ART regimen were noted. Furthermore, substantial weaknesses in re-testing of women undermines the success of eliminating mother-to-child transmission (eMTCT) efforts. Integration of HIV services into MNCH programs other than PMTCT are very poor. These include limited testing of men, limited testing of sick young infants and children under five years old in primary care settings, poor counseling and offering FP services for HIV-positive women, and poor adolescent counseling and preventive practices. This means that the opportunity to offer the HIV test to persons seeking other services and who did not know their status or who might be at higher risk of HIV infection was missed. Integration between PMTCT and ongoing HIV care was poor in both countries, with limited evidence of clinical follow-up of HIV-positive women on life-long ART. Systemic processes for monitoring and ensuring follow-through for a woman and her infant from HIV-positive diagnosis to maternal enrollment in life-long ART and follow-up of the exposed infant were not identified.

Recommendations

- Strengthen the system for identifying eligible HIV-negative women and retesting to ensure that the current HIV status and appropriate measures are taken for PMTCT throughout the pregnancy and breastfeeding period.
- Educate providers and then monitor implementation of a uniform system for recording HIV status and the ARV regimen for HIV-positive women at different times during pregnancy through the postpartum period to improve accurate monitoring of pregnant women and reduce the risk of missing women whose HIV status is not current.
- Monitoring systems around integrated PMTCT and RMNCAH services on one hand and PMTCT and ongoing HIV care on the other should be strengthened and include measures around identified weaknesses (testing for men, retesting of pregnant women, testing of sick children under five years old, monitoring viral load, PrEP, and knowledge of HIV status and risky behaviors).
- Methods such as QI coaching and clinical mentoring in combination with provider decision support tools (e.g., posting posters in various service sites to increase awareness of signs/symptoms of HIV infection and to promote patients asking for/providers offering HIV testing for persons at risk of HIV infection) can be considered to reinforce correct and consistent use of evidence-based clinical recommendations. The results of these efforts should be regularly monitored and used for continuous improvement, learning, and adaptation.

I. BACKGROUND

While major progress has been made over the past two decades in improving mortality outcomes in women and children – major disparities remain in survival rates around the time of birth for mothers and infants born in high-, middle- and low-income countries. A significant gap continues to exist between actual and achievable health care outcomes, primarily because effective interventions are not implemented for every patient, every time there is an opportunity. While access to and use of services for reproductive, maternal, newborn, child and adolescent health (RMNCAH) care has increased globally, and in some countries beyond expectations, the quality of care (QoC) remains an impediment to accelerating the pace in Preventing Child and Maternal Death (PCMD), including preventable morbidity and mortality from HIV in this target population in PCMD and U.S. President's Emergency Plan for AIDS Relief (PEPFAR) priority countries. Fragmentation of RMNCAH and HIV programming at different levels creates additional challenges for delivering high quality, integrated, people-centered RMNCAH and HIV care across the RMNCAH continuum.

There has been much progress internationally in the provision of services for HIV prevention and treatment. A focus over the past years has been to integrate HIV services across the health service spectrum, so that every contact provides an opportunity for preventive education, case detection, and improving patient follow-up. Successful HIV services require not only provision of preventive and curative services, but also counseling, patient follow-up, and linkages within and across services, service sites, and communities, to ensure that the patient actually receives the available services that are important for HIV prevention and treatment, across the lifecycle continuum. This includes two types of integration: physical integration (i.e., the facility/unit providing both HIV and RMNCAH services) and functional integration (e.g., ensuring women and babies are linked to HIV care after preventing mother-to-child transmission of HIV [PMTCT]). Improving HIV case detection and outcomes for mothers, children, and adolescents requires both types of integration for effective and efficient use of resources. Critical paths for HIV services include: a) counseling on preventing HIV and other sexually transmitted infections (STIs), including a focus on adolescents (many of whom are or will be mothers) that includes promoting safe sexual practices (gateway services may be family planning [FP] and curative care services); b) identifying persons at risk for HIV infection and offering antiretroviral (ARV) for pre-exposure prophylaxis (PrEP) as well as testing and follow-up on test results; c) case detection and services for PMTCT provided through antenatal care (ANC) and labor and delivery (L&D) services (identification of risk for infection during pregnancy, HIV testing of negative women on a periodic basis to identify new infections, ARV interventions for the infected mother along with counseling on infant feeding and FP, ARV interventions for the exposed infant/postnatal and early infant care); d) detection of the at-risk or infected child (child health services); and e) lifelong treatment for HIV-infected persons (antiretroviral therapy [ART] services). Integrated services may be particularly relevant for PMTCT, where women (and exposed infants) require specific services and follow-up at different times (and often different locations) over the course of pregnancy through the postpartum period. For example, ANC services must be linked with HIV testing, ART, and L&D services; L&D services must be linked with HIV testing and postpartum follow-up for PMTCT; postpartum care must be linked with long-term follow-up for life-long ART; and infant testing services must be linked with follow-up services should the infant test positive.

Understanding gaps in quality of RMNCAH care, supporting systems for patient follow-up at the service delivery level, and the extent to which HIV services are provided in an integrated manner is an essential first step to initiate improvement interventions. While there are multiple tools to assess the quality of RMNCAH services (e.g., Service Availability and Readiness Assessment [SARA], Service Provision Assessment [SPA], World Health Organization [WHO] SARA Hospital Assessment, Maternal Child Survival Program [MCSP] assessment, Site Improvement through Monitoring Systems [SIMS], HIV/AIDS Sustainability Index and Dashboard [SID]), there is the need to update survey tools so that they a) incorporate updated evidence on RMNCAH and HIV care such as those described in WHO standards for quality assessment, improvement, and accreditation for HIV care; b) assess HIV prevention, early

detection, treatment, and counseling services as integral components of RMNCAH care at the service delivery level; c) are aligned with global measurement frameworks that have defined indicators (e.g., Every Newborn Action Plan, WHO QoC indicators around childbirth, Ending Preventable Maternal Mortality, WHO 100 Global indicators, and PEPFAR Monitoring, Evaluation and Reporting Indicators); d) are tailored to the context of Ending Preventable Child and Maternal Deaths and PEPFAR priority countries; e) allow assessment of the RMNCAH care continuum; f) help facility quality improvement (QI) teams and governments to identify and address gaps in QoC to achieve maternal and child mortality prevention and 90-90-90 targets; and g) ensure integration with various HIV prevention efforts, including DREAMS (Determined, Resilient, Empowered, AIDS-free, Mentored and Safe) and Global Health Initiative mandates. In Fiscal Year (FY) 2017, the USAID Office of Health Systems tasked the USAID Applying Science to Strengthen and Improve Systems Project (ASSIST) team to develop a survey toolkit to examine the quality of care of essential RMNCAH services for clinical conditions contributing to the highest share of maternal and child mortality and to test the tool in two or three priority PCMD countries. In 2017 the USAID Office of HIV for USAID Washington (OHA) provided additional funds to incorporate the HIV component into the RMNCAH quality of care assessment tools and conduct the assessment in at least one PCMD and one PEPFAR priority country. The objective was to develop universal tools that could be used to assess the state of integrated RMNCAH and HIV care and, by implementing the assessment in at least one priority country, support prioritization of improvement interventions, enable comparisons and coordination of improvement efforts, and help to identify and address gaps in integrated RMNCAH and HIV care in PCMD and PEPFAR priority countries.

A. Epidemiologic and population-level HIV data

Incidence and prevalence of HIV: Both Kenya and Uganda are PEPFAR priority countries with high HIV prevalence (AVERT 2018a; AVERT 2018b). According to latest Population-based HIV Impact Assessments (2016-2017 in Uganda and 2018 in Kenya), it is estimated that 6.2% of adults (15-64) in Uganda are HIV-infected (Uganda MOH, 2019; Kenya MOH, 2020). HIV prevalence in study regions are similar in Uganda (7.6% in Central 2 Region and 7.2% in Mid North) and higher, compared to national average. In contrast, HIV prevalence substantially differs among study counties in Kenya, 2.3% in Kilifi and 17.5% in Kisumu, and with national average of 4.9% (Kenya MOH, 2020). Contrary to the adult population, the HIV prevalence among children aged 0-14 years is higher in Kenya (0.7%) than in Uganda (0.5%). The burden of HIV prevalence is higher among women than men in both countries. While annual incidence data is not available by geographies, annual HIV incidence in Kenya (0.15%) among people 15-49 years old is lower than in Uganda (0.47% among women and 0.31% among men) (Uganda MOH, 2019; Kenya MOH, 2020).

Self-reported HIV testing: Knowledge of where to get HIV testing is over 90% in all study geographies of Kenya and Uganda. In Uganda, 75.9% of adults (those aged 15-64 years) reported that they have ever tested for HIV and received test results—more than two-thirds (68.9%) of men and 82.1% of women. Both study regions of Uganda have lower self-reported HIV testing (78.9% in Central 2 and 76.1% in Mid North respectively). In Kenya, 79.5% of adults were ever tested for HIV and received results (Uganda MOH 2019; Kenya MOH 2020). According to DHS surveys, both Uganda (2016) and Kenya (2014) study districts show higher testing and test-result rates than UPHIA surveys, over 80% of women and more than 64% men. However, in Kilifi County, Kenya, HIV testing with known results among adult male population was higher (90%) (Kenya DHS 2014). HIV testing in the 12 months preceding the survey among adults, who received the test results was poorer in all study geographies in Uganda and Kenya, with the highest performance in Kilifi County of Kenya (62% among women and 65% among men). Women reported higher testing rates than men in other study regions.

90-90-90 targets

HIV diagnosis: In Uganda, 66.2% of adults (those aged 15-64 years) living with HIV know their HIV status. Study regions show variable success rates in HIV status awareness and treatment. In Uganda,

71.5% of HIV-positive adults (those aged 15-64 years) in Central 2 region and 75.9% in Mid North region know their status. In Kenya, 79.5% of the adult population know their HIV-positive status.²

Treatment: Based on self-report and ARV detection data, 87.6% of adults in Central 2 region and 82.5% of adults in Mid North Region of Uganda, who are living with HIV and know their status, are receiving ART. This is less than the national average (90.4%). Over 96% of the adult HIV-positive population in Kenya receive ART (Uganda MOH 2019; Kenya MOH 2020). Among those who are aware, 92% of HIV-positive men and 89.8% of HIV-positive women, respectively, are on ART treatment (Uganda MOH 2019).³

Viral load suppression (VLS): Among HIV-positive adults (those aged 15-64 years) 59.6% in Uganda and 71.6% in Kenya have achieved VLS (Uganda MOH, 2019; Kenya MOH, 2020). VLS rates are slightly lower in study regions of Uganda (56.9% in Central 2 region and 54.6% in Mid North region), with higher rates among women than men. The prevalence of VLS increased with increasing age for those between the ages of 20-54 years, from 39.6% among HIV-positive people aged 20-24 years to 74.2% among those aged 50-54 years. Less than 40% of children (those aged 0-14-years) had achieved VLS in Uganda (Uganda MOH 2019).

Among adults living with HIV who reported ART use or had detectable ARVs in their blood, 83.7% had achieved VLS in Uganda: 87.5% in Central 2 and 80% in Mid North Regions (the 3rd 90 target). Like other 90 targets, VLS is higher among adult population in Kenya who report being on ART (90.6%), than in Uganda (Uganda MOH 2019; Kenya MOH 2020).

PMTCT: In Uganda, 98.4% of women of childbearing age (those aged 15-49 years) who delivered in the three years preceding the survey attended at least one ANC visit for their most recent birth. Study districts of Uganda also show over 98.2% ANC attendance rate. ANC attendance in study counties of Kenya is also high, over 95% (Uganda MOH 2019; Kenya MOH 2020).

Among mothers who gave birth within the 12 months preceding the survey, 90.9% knew their HIV status in Uganda: 90.2% in Central 2 region and 94.7% in Mid North region. However, known status among adolescent pregnant women is lower (84%) (Uganda MOH, 2019). In Kenya, about 96% of pregnant women know their status. DHS data both from Uganda (2016) and Kenya (2014) reported lower counseling and testing for HIV: the proportion of pregnant women counselled on HIV and receiving the test results ranged from 59% in Kilifi County of Kenya to 92% in Lango region of Uganda, with lower overall performance in Kenya. In contrast, the proportion of pregnant women who had HIV test results during ANC or labor and received results was substantially higher in Kenya (over 95% in both study counties) than in Uganda (66.3% in North Central and 85.7% in Lango region) (Kenya DHS, 2014; Uganda DHS, 2016), indicating higher performance of testing women during labor in Kenya, compared to Uganda.

Among HIV-positive mothers who gave birth in the 12 months before the survey, 72.9% were already on ART prior to pregnancy and 22.3% were newly initiated on ARVs during pregnancy, labor, and delivery. Among all HIV-positive women who gave birth in the 12 months preceding the survey, 95.3% reported use of ART during pregnancy, which indicates high coverage of ART provision for PMTCT (Uganda MOH 2019). In Kenya, 92.1% of HIV-positive pregnant women reported to be on ART (Kenya MOH 2020).

Among infants born in the 17 months before the survey to HIV-positive women, 15.6% were confirmed HIV-positive by the virologic testing in Uganda. Among infants born in the same period to HIV-positive women who were already on ART at first ANC visit, only 3.4% were confirmed positive by virologic testing

² No regional estimates are available in Kenya.

³ Regional data on HIV diagnosis and treatment are not available in Kenya.

(Uganda MOH 2019), suggesting effectiveness of early testing and treatment prior to pregnancy. Knowledge of PMTCT among women (age 15-49) was higher in Kenya (over 80%) than in Uganda (61%) (Uganda MOH 2019; Kenya MOH 2020).

Adolescents and young adults: The prevalence of HIV among young people in Uganda is 2.1%.⁴ Early sexual debut (self-report of sex before 15 years of age) is estimated at 13.6% (13.8% in Central 2 region and 12.1% in Mid North Region) with higher prevalence among boys than girls. Similarly, more boys started sex at early age, than girls in Kenya, with substantial regional differences between study regions; 9.3% of girls had sexual intercourse before age 15 in Coast region, compared to 20.9% in Nyanza region (Kenya DHS 2014; Uganda DHS 2016).

About two-thirds of young women (aged 15-24 years) in Uganda and about half of young men with sexual intercourse in the past 12 months were tested in the past 12 months and received the test results (Uganda DHS 2016). Similarly, adolescent women in study districts of Kenya reported higher testing in the last 12 months, with the testing rate being the highest among adolescent women in Nyanza (75%) and lowest among adolescent men in Coast region (42.5%) (Kenya DHS 2014). Among adolescents aged 15-19, only 37.2% of HIV-positive were aware of their HIV status in Uganda. Out of those who were aware, 15% reported that they are not on ART (Uganda MOH, 2019). More than half of young people living with HIV had not been diagnosed. Among those on ART, more than a quarter did not have suppressed viral loads. Only 54.4% of older adolescent boys and young men had ever tested for HIV in Uganda (Uganda MOH 2019).

Adolescents' comprehensive knowledge about AIDS was low in both countries but higher in Kenya. Slightly over half of adolescents in Coast region and 64% adolescents in Nyanza region of Kenya had comprehensive knowledge on AIDS, higher than the national average (46%) (Kenya DHS 2014).

Children: Approximately 0.5% of Ugandan children (ages 0-14 years) and 0.7% of Kenyan children are living with HIV. Based on parents' reports, adjusted for ARVs detected in children's blood, only 56.3% of children diagnosed with HIV in Uganda had been previously diagnosed and more than half of HIV-positive children (54.3%) were not on ART. Similar data are not yet available in Kenya, however, the nationwide 90-90-90 cascade in this age category was the lowest performing (78.9% -93.2%-67.1%) (Uganda MOH 2019; Kenya MOH 2020).

Given the high HIV prevalence, both countries have vigorously pursued HIV program expansions, with both Uganda (Uganda MOH 2016a, Uganda MOH 2016b), and Kenya (NASCOP 2015, NASCOP 2016), having policies for integrated HIV services. Additionally, both countries have adopted the WHO recommendations for:

- Retesting HIV-negative pregnant women every three months after their first negative test until after delivery, and periodically (with the frequency depending on risk factors) during breast feeding.
- PrEP

Along with a focus on assessing HIV services related to PMTCT, within the context of this study, assessment of integration included:

- Whether clinic visits for non-HIV services were used to promote preventive education, HIV case detection, and identification of persons at higher risk of HIV infection among eligible persons (e.g., sick children and their caregiver, partners of patients, adolescents).

⁴ Latest PHIA data are not yet available in Kenya.

- Whether FP services were counseled/offered where eligible clients might be receiving other services (sick child care, various maternal health services, adolescent health services).
- Linkages between services related to prevention and clinical follow-up for HIV-positive patients.

This assessment was part of a larger assessment of RMNCAH services, with the HIV focus on integration of RMNCAH and HIV services. The assessment did not focus on the quality and continuity of life-long HIV treatment among HIV-positive patients. The scope includes availability and provision of services as well as trained staff, guidelines, and patient follow-up systems relevant to:

- 1) Counseling on preventing HIV and other STIs among target populations (e.g. adolescents);
- 2) Case detection and identification of risk for infection during pregnancy, childbirth and immediate postpartum;
- 3) Services for the exposed infant;
- 4) Assessing the HIV status of the partner of the pregnant woman, and PrEP services;
- 5) ARV interventions for the infected mother during pregnancy (ANC, delivery, and postnatal care) along with counseling on infant feeding, FP, and interventions for the exposed infant (postnatal and early infant care); and
- 6) Detection of the infected child (child health services).

II. METHODS

A. Study design

This was a cross-sectional health facility-based survey using mixed methods for data collection. Data were collected over the course of one to two days in each facility during May 2017-February 2018.

The RMNCAH quality of care assessment was conducted in 10 select facilities in Uganda and 11 facilities in Kenya. In addition, after receiving additional funding from USAID OHA, survey tools were revised to incorporate further questions on integrated HIV and RMNCAH services into the tools. These revised tools were implemented in six of the eleven facilities in Kenya, where data had not yet been collected. Thus, in Kenya, five facilities were assessed using the initial survey tools, and six facilities with revised survey tools.

B. Tools and country adaptation

The USAID ASSIST team developed the survey toolkit for assessing the quality of integrated RMNCAH including HIV services for pregnant women, exposed infants, sick children, and adolescents in 2017 and tested it in Uganda and Kenya during May 2017-Feb 2018.

This information on HIV services was a subset of information collected during a survey of the quality of RMNC+A care. The HIV focus for the data collection tools was based on assessing compliance with WHO evidence-based clinical recommendations and commonly promoted health system support activities for HIV and AIDS services.^{5,6}

⁵ Consolidated Guidelines on HIV prevention, diagnosis, treatment and care for key populations, WHO, 2016 update.

⁶ Consolidated guidelines on the use of antiretroviral drugs for treating and prevention HIV infection recommendations for public health approach. WHO, Second Edition, 2016.

C. Methods for data collection

Facility level information: Key informants (managers and service providers) who were knowledgeable about facility resources were identified and asked to provide information on availability of drugs, laboratory tests, and implementation of facility-level systems for patient follow-up. Where relevant, the data collector asked to see items to verify availability. Additional information on facility resources and patient follow-up systems was collected from a subset of Kenyan facilities to provide more details on HIV services.

Provider interviews: Providers of the relevant services were asked to self-complete a general module about their training, experiences, and opinions about working conditions, and then to complete service-specific modules related to services they provide, where their experience, knowledge, attitudes, and practices related to specific services were assessed.

Interviewed clients: Clients who received specific services in the facility (ANC, delivery, child health care, and adolescent services) were interviewed about their opinions as well as knowledge about their condition and services they had received, and their opinions of how they were treated. Informed consents were required for all interviewed clients. Parental consent was sought prior to the interview of adolescents below 18 who were not pregnant or had not given birth, and those who had not previously delivered, but were attending RMNCAH health clinics.

Observations of client-provider interactions: Informed consent was obtained from observed clients and service providers. The data collector sat in the area where the consultancy was taking place. Using a checklist, the data collector was instructed to mark the information that was shared between the provider and the client, regardless of whether the provider asked, or the client volunteered the information. In addition, any examinations or tests performed were to be marked. They were not to speak or interrupt the consultation. After the consultation, the observer was allowed to check the client chart/record for information that might have been documented for earlier visits or that might have been gathered during this visit but not observed (e.g., if the patient went to a laboratory) and to clarify specific information with the provider.

Record reviews: Individual patient records (or registers with individual patient information) maintained at the facility were reviewed retrospectively for documentation of initial patient assessments, results of any tests and measurements, diagnoses and interventions, and documentation of information shared between clients and service providers. For each service with retrospective record reviews, the best available medical documentation (individual patient charts/records including service-specific documents such as partographs, and service registers) was reviewed for recording of patient-specific information. For most ANC and sick child cases there were no individual patient records maintained at the facility, so information was collected from structured registers where individual patient information was recorded.

Prior to data collection, all data collection instruments were field-tested to ensure clarity and logical flow of questions in both countries. These tools were then revised to ensure the highest level of data quality and adaptation to local context. The questionnaires were structured to generate information specific to each objective.

D. Samples for each tool

Facilities: In each country, study facilities (10 in Uganda and 11 in Kenya) were purposefully selected. Initial RMNCAH quality of care survey tools had information on integrated RMNCAH and HIV care and were used in 10 facilities in Uganda and five facilities in Kenya during 2017 (Kisumu County). Because of a nurse's strike, in June 2017, the assessment was stopped in Kenya. With additional funding, the survey tools were revised to incorporate more in-depth information on integrated RMNCAH and HIV care. These new tools were then used to assess integrated RMNCAH and HIV care in six additional facilities in Kenya (Kilifi County).

The following criteria were used to prioritize selection of facilities:

- Districts/facilities with high inpatient and outpatient volume and/or high maternal and mortality for children under five years old;
- Facilities representing all levels of RMNCAH services within each district and having referral linkages;
- Facilities in different geographic areas with not more than two districts within the same region;
- Facilities with no ongoing external QI intervention in RMNCAH services;
- Facilities where a similar assessment had not been performed recently.

Twenty percent of the Ugandan facilities and 73% of the Kenyan facilities were hospitals. The remaining facilities were health centers, with most of the Ugandan health centers classified as level III (n=3) or IV (n=5).^{7,8} All health centers from both countries reported providing inpatient services. **Annex Table 1** lists the types of facilities within each sample.

Providers: All health workers providing RMNCAH services who were present in the facility on the day(s) of assessment and who agreed to participate in a personal interview (informed consents were required) were included in the provider sample. Samples varied among facilities, depending on availability (presence but also time availability depending on the workload) of the providers. Most respondents from both countries were nurses or midwives who, on average, had completed their pre-service training around 10 years prior and had worked in the facility for an average of six years. Kenya, however, had a higher percentage of respondents who were physician/medical officer level. The majority of service provider respondents for each country came from three facilities (one hospital and two health centers in Uganda and three hospitals in Kenya).

In total, 71 different providers from Uganda and 104 from Kenya provided responses about their knowledge and HIV services provided in relation to the specific RMNCAH service that was assessed. **Annex Tables 1** and **2** provide further details on these respondents, including their facility distribution.

Interviewed clients: Eligible clients included women who attended the ANC clinic or gave birth in the facility (interviewed before discharge); women who had given birth within the last three months attending postnatal or MCH clinics; caretakers of sick children; and young adolescents aged 15-19 years old who had at least one previous medical visit in the facility.

All interviewed clients were female, with an average age of 24.1 (Uganda) and 25.1 (Kenya). Ugandan respondents were somewhat less educated than Kenyan, with 47% compared with 32% having no formal education or some primary school. Most (62% for Uganda and 55% for Kenya) were housewives living with their husbands (88% for Uganda and 78% for Kenya). The majority from both countries described themselves as low-middle or middle-income and in good health.

In total, 360 different clients from Uganda and 266 from Kenya were interviewed. **Annex Tables 3** and **4** provide further details on characteristics and facility distribution of interviewed clients.

Clients with observations on care: Observations were conducted for clients receiving ANC services, L&D services, and children 0-59 months old receiving curative care services.

7

⁸ <https://www.theguardian.com/katine/2009/apr/01/uganda-healthcare-system-explained>

Eligibility for observation:

- **Labor and delivery:** All pregnant women, mothers, and newborns present the day of the survey were eligible for observation. Women were observed at different points in the L&D process (admission, active L&D, and postpartum), and the same woman was not necessarily observed at the different points. Progress in labor moves at different paces for different women, and the observers moved between women so that they could observe the services at different stages for larger numbers of women than would occur if they followed each woman from admission through the postpartum stage.
- **Sick young infants and children:** Inclusion criteria for sick children were as follows:
 - Young infants 0-59 days old with any of the following:
 - Complaints or signs of severe illness, i.e., change in consciousness/lethargy, convulsions, vomiting everything and unable to feed or breastfeed, fever, low body temperature, diarrhea/vomiting.
 - Nutrition or feeding problems; yellowing of eyes/skin.
 - Cyanosis, surgical conditions, bleeding that required transfusion.
 - Children 60 days to 59 months old with any of the following:
 - Signs/symptoms of severe illness (e.g., change in consciousness/lethargy, convulsions, vomiting everything, unable to feed or breastfeed).
 - Fever/malaria, cough, fast/difficulty of breathing, pneumonia, diarrhea/vomiting, ear problem, measles, nutrition or feeding problems.
 - This was the first outpatient visit for the child for this condition (i.e., this was not a follow-up visit for the condition).

In total, service provision was observed for 363 Ugandan and 401 Kenyan clients. **Annex Table 5** provides further details on the care observations by service and facility distribution.

Record reviews: The sample for each service was selected by reviewing the service register and identifying the most recent 15 eligible clients for each respective population (pregnant women visits, childbirth, sick children aged under five years old) and then additional cases meeting specific criteria. A record that met more than one selection criteria was considered for all applicable samples. The exact sample size for each facility was influenced by the availability of records for the criteria (e.g., some facilities had few HIV-positive patients) and the time data collectors had to collect the information.

Following are the sampling criteria for each service:

- **ANC services:** For each facility, select the most recent 15 clients, plus additional records for at least 15 clients with blood pressure >140/90 and 15 clients with HIV-positive status. The final record selection included 45% (n=160) from Uganda and 35% (n=163) from Kenya, specifically selected for HIV-positive status.
- **Childbirth services:**
 - *General sample:* Records were selected to provide sufficient numbers of patients with specific conditions. The conditions included HIV-positive status, but also newborn conditions (asphyxia, low birth weight, and prematurity). The final record selection included 52% (n=129) from Uganda and 42% (n=110) from Kenya specifically selected for HIV-positive status;
 - *Maternal complications sample:* Select cases with severe preeclampsia/eclampsia, postpartum hemorrhage, obstructed labor, prematurity (<37 weeks gestation);

- Newborns with diagnosed newborn asphyxia, prematurity (birth at <37 weeks gestation) and very low birth weight ($\leq 2000\text{g}$);
- Outpatient department patients aged from 60-59 months old with diagnoses of diarrhea or pneumonia;
- Outpatient department patients 0-59 days old with:
 - Documented signs of serious infection and/or relevant diagnosis (sepsis, severe pneumonia, malaria, meningitis) who were referred to higher-level facilities;
 - Documented signs of serious infection and/or relevant diagnosis (sepsis, severe pneumonia, malaria, meningitis) who were treated at outpatient level;
 - Diagnosis of pneumonia or fast breathing (respiratory rate >60 per minute).

Retrospective record reviews were conducted for a total of 1694 Ugandan and 2503 Kenyan clients. Sample information is available in **Table 1. Annex Table 6** provides further details on the sample of records reviewed. **Annex Table 7** provides details on ANC record reviews, and **Annex Table 8** provides details on L&D record reviews, by facility and eligibility criteria.

Table 1: Sample information

| Sample facilities | Uganda | All Kenya, including additional sites | Number of Kenyan facilities (subset of all Kenyan facilities) where additional HIV information was collected |
|---|--------|---------------------------------------|--|
| Health center | 8 | 3 | 2 |
| Health centers Level 3 | 3 | | |
| Health centers Level 4 | 5 | | |
| Hospital | 2 | 8 | 4 |
| Total number of facilities | 10 | 11 | 6 |
| Service providers providing responses¹ | | | |
| ANC service provider | 21 | 30 | 17 |
| Delivery service providers | 31 | 20 | 0 |
| Newborn care providers | 30 | 22 | 0 |
| Child health service providers | 19 | 11 | 0 |
| Adolescent service providers | 28 | 23 | 21 |
| Client interviews² | | | |
| Interviewed ANC clients | 160 | 161 | 0 |
| Interviewed delivery clients | 105 | 80 | 37 |
| Interviewed adolescents (health literacy) | 95 | 15 ³ | 0 |
| Interviewed adolescents (health services) | 93 | 13 ³ | 0 |
| Observed consultations | | | |
| Observation of service provision (ANC) | 137 | 144 | 93 |
| Observation of service provision (sick child ≥ 2 months) | 145 | 168 | 0 |
| Observation of service provision (sick child < 2 months) | 22 | 68 | 0 |
| Observation of service provision (intra and immediate postpartum care before discharge) | 59 | 21 | 0 |

| Sample facilities | Uganda | All Kenya, including additional sites | Number of Kenyan facilities (subset of all Kenyan facilities) where additional HIV information was collected |
|---|--------|---------------------------------------|--|
| Record reviews | | | |
| ANC (primarily information in registers) | 356 | 462 | 0 |
| Labor, delivery, postpartum (general sample) | 247 | 262 | 0 |
| Labor, delivery, postpartum (maternal complications sample) <i>[no HIV information collected]</i> | 354 | 207 | 0 |
| Sick child record reviews (primarily information in registers) | 737 | 786 | 0 |
| ¹ A service provider may have given responses to more than one service section. ² The interviewed adolescents for both sections overlap. ³ Kenyan data collectors reported that adolescent patients were rarely available in the sample facilities at the time of the visit. | | | |

Training and quality control: Data collectors received three and a half days of training that covered the study protocol, the data collection tools, and how to collect the information in the facility. Specific information covered and the training methods included the following:

- One day classroom training that included a review of the study protocol, an overview of the assessment and its objectives, and research ethics related to confidentiality and informed consent of study participants.
- Additionally, all data collection tools and informed consent forms were reviewed, with instructions for how to administer the questionnaires and complete responses in the forms and guidance provided on data extraction from registers and patient records. Data collectors involved in direct observation of care (ANC, childbirth services, and young infant/child outpatient visits) and a simulated clinical scenario for neonatal resuscitation were trained on the appropriate use and implementation of the data collection tools, as well as how to conduct objective and ethical participant observation.
- Two days of practical experience in data collection in one health facility in Uganda and two in Kenya that provided the full range of services assessed but were not selected for the survey.

To maximize the quality and efficiency of data collection in the context of clinical content expertise, data collection teams were organized into three main domains (ANC services, childbirth services, and child and young infant care services), with each team assigned to conduct medical documentation reviews and observations for their domain of expertise. Data collectors with less clinical content expertise but knowledge of the local language were assigned to conduct client interviews.

Supervision and quality control: A supervisor was assigned to oversee the fieldwork, check the completion and quality of collected data for each data collector and data collection tool, distribute self-administered provider questionnaires, and complete the facility-level inputs tool (Tool #1). The team supervisor provided oversight in the field in order to ensure that quantitative data met good data quality standards in terms of: 1) validity; 2) integrity; 3) precision; 4) reliability; and 5) timeliness.

The field teams met daily during the data collection phase to review completed tools, data collection progress, and plan next steps. Quantitative data forms were reviewed daily for completeness. Random

spot checks of the quantitative data were completed by the Principal Investigator (in Kenya, Kisumu County) or Assessment Supervisor (in Kenya and Uganda) to assure accuracy, validity, and completeness of the data. Any issues related to data quality and completeness were rechecked in the field. Due to a large number of questionnaires and data collection tools, data entry was not able to be completed in parallel of the fieldwork, preventing correction if inconsistencies or missing data (when such existed) were identified during data entry.

Data processing and analysis: Safe handling and security of all data in both hard and soft formats were strictly enforced. To maintain strict anonymity of data, protect survey respondents, and comply with ethical standards, informed consent forms and completed data collection tools were kept separately, and data collection tools did not include any individually identifiable data.

Data for each set of tools were entered into excel-based data entry tools, with ranges set to reduce data entry errors. Data analysis was conducted for each set of tools separately using Excel and SPSS v18. Univariate frequency distributions for key variables with checks on outliers was performed.

Descriptive statistics were compiled from the knowledge and skills questionnaires and facility inputs tool. For a few items, where it was important for understanding results, crosstabulations were carried out.

There were numerous missing responses in the self-administered provider interviews. Where there were responses to the main topic but missing responses for related, following questions, the missing responses were assumed to be “no” or “negative”, under the assumption that respondents are more likely to provide responses for what they know or do and more likely to skip those that do not apply to them. In some cases, where it was not appropriate to classify missing information as negative, the percentage where a response is missing is provided.

Ethical considerations: The study posed minimal risk given that the formative and evaluative assessment components were non-invasive and the questions and topics discussed were within the scope of day-to-day health service delivery and utilization parameters. For all information obtained, the privacy of providers and clients was maintained: the provider questionnaires and register reviews were anonymous, without any identification of individual provider or client information.

Questionnaire completion and observation of visits were conducted after receiving written consent from the respondents and caretakers.

The study protocol was approved by a registered Institutional Review Board in the United States (University Research Co. LLC) and by the ethical committee review boards in Uganda (Makerere University College of Health Sciences, Ref # HDREC, 480) and Kenya (Maseno University Ethics Review Committee, Ref #MSU/DRPI/MUERC/00409/17).

Limitations: The objective of the sample selection for all tools, including selection of facilities, was to test the tools and data collection methods. Thus, the sample was not meant to be representative of district or national services. While the results are important for documenting general practices, they cannot be used to make comparisons between facilities, countries, and services related to the HIV prevalence in the catchment area of the facilities.

The results from this survey were impacted by opportunistic samples for observations and self-administered provider questionnaires, where there were substantial numbers of missing responses.

The data are presented by totals, which may be biased when a large percentage of the information, specifically for individual provider responses and service observations, comes from a few sample facilities. This is specified where it seems most relevant.

Observations were limited to clients/patients available on the day of the survey. A limitation in observing ANC, childbirth services, and outpatient visits of children is that observation itself may cause the health care provider to modify his or her behavior. However, the assumption is that after a few minutes, the provider will become accustomed to the presence of an observer and function in a more natural fashion.

The results are sometimes inconsistent for the same item across data collection methods and samples. However, when the data on a subject are triangulated across the different sources of data, the results can confidently be said to reflect the general practices and issues for the facilities, for the services assessed.

Analysis and interpretation: The findings from the various tools were triangulated to provide an overview of the strengths and weaknesses in practices and adherence to WHO recommendations for best practices related to integrated HIV services. The information was analyzed at the individual level (service provider, client, observation, record review) and facility level (resources and systems). Individual client and service provider level information may be biased toward facilities with larger caseloads—which sometimes had a larger representation in samples. In most cases these were hospitals. **Annex Tables 2 and 4** provide details on the sample of service providers and interviewed clients by facility.

The samples of clients across the various methods (e.g., record reviews, observations, client interviews) of data collection within each service are not the same persons, so results are triangulated to provide a general picture of the findings for specific items. The selective nature of the samples and the limited number of facilities where data were collected mean that the data are not representative.

III. FINDINGS

A. Case detection and HIV testing

Counseling and testing for HIV during ANC: Most interviewed ANC service providers (100%, Uganda and 97%, Kenya) reported that ANC clients are routinely tested for HIV infection, with almost all interviewed clients (99%, Uganda and 97%, Kenya) reporting they had received an HIV test during their pregnancy. During the observed ANC consultations, 87% of the Ugandan and 58% of the Kenyan women were asked about their HIV status or their status was discussed, with 92% of those with whom the HIV status was discussed (from both countries) then counseled/offered an HIV test.

Annex Tables 9 and 10 provide further details on information from ANC service provider and client interviews and client observations.

Among the ANC records retrospectively reviewed, 45% (Uganda) and 36% (Kenya) were for HIV-positive ANC clients, selected specifically to ensure sufficient numbers to assess the care for HIV-positive women. These records documented that almost all ANC clients (99% Uganda and 96% Kenya) were counseled about the importance of the HIV test (**Table 2**).

In total, the final HIV status was recorded for 99% (Uganda) and 82% (Kenya) of the ANC clients whose records were reviewed. The final unknown status for clients (1% in Uganda and 18% in Kenya) may be because the test was not offered, the client refused the test, or the result of a performed test was not recorded (**Table 2**). Of note was that 41% of the Ugandan women did not know their HIV status on their first ANC visit (1st 90% PEPFAR target), and that as of the most recent visit, the HIV status was not recorded for 18% of Kenyan women.

Table 2: Record review documentation for ANC clients: HIV testing and status

| Indicator | Uganda (n=356) | Kenya (n=462) |
|---|----------------|----------------|
| HIV status documented in records | | |
| Any note indicating assessment of HIV status/discussion of importance of HIV test | 99% (n=353) | 96% (n=445) |
| Status prior to current visit | | |
| Positive prior to current visit ¹ | 36% (n=128) | 45% (n=162) |
| Negative prior to current visit | 22% (n=80) | 35% (n=209) |
| Patient did not know status | 41% (n=145) | 16% (n=74) |
| No documentation that status was assessed | 1% (n=3) | 4% (n=17) |
| Among prior known negative | (n=80) | (n=209) |

| Indicator | Uganda (n=356) | Kenya (n=462) |
|---|----------------|---------------|
| Previously negative and retested this visit | 96% (n=77) | 10% (n=20) |
| Among prior status unknown/not assessed | (n=148) | (n=91) |
| Tested most recent visit, result negative | 76% (n=113) | 4% (n=4) |
| Tested most recent visit, result positive | 22% (n=32) | 0% (n=0) |
| Test not documented for most recent visit | 2 % (n=3) | 96% (n=87) |
| Most recent HIV test result (any visit) | (n=356) | (n=462) |
| Positive test recorded ¹ | 45% (n=160) | 35% (n=162) |
| Positive: positive test result not recorded but documentation of both HIV staging and an ART regimen being prescribed | 0% | 1% (n=5) |
| Negative | 54% (n=193) | 46% (n=213) |
| Not known | 1% (n=3) | 18% (n=82) |

¹ The rate of positivity is biased as the sample included a select subset for HIV-positive women.

Counseling and testing for HIV during L&D: When interpreting results it must be remembered, as noted in the methods section, the women who were observed at different stages in the L&D care process (admission, active L&D, and postpartum) were not necessarily the same women, and the interviewed women who had delivered may have been observed at different times in the L&D care process, so results between data sources cannot be directly linked, but can be compared for consistency in results.

HIV status was observed being assessed for 88% of the L&D women from both countries. HIV status was documented in the personal charts for 69% of all observed women from both countries (this includes women whose admission assessment may not have been observed). On admission for delivery, 89% of a subset of interviewed Kenyan women⁹ reported they knew their HIV status, and all of the women who did not know their status on admission reported they were offered an HIV test at that time.¹⁰ **Annex Table 13** provides further HIV information for observed women during labor and delivery.

Among records reviewed (retrospectively) for delivered women (a different sample from those whose L&D services were observed) HIV status was recorded on admission for 91% of Ugandan women and 93% of Kenyan women (**Table 3**).

Retesting HIV-negative pregnant women: For PMTCT, it is recommended to retest HIV negative women three months after their first HIV positive test, since their status may change over the course of pregnancy.¹¹ Reviewed records, however, showed that among Ugandan women, almost all (96%) who had a known negative status at their prior visit were re-tested. Kenya records showed that only 10% of known negative women were retested (**Table 2**). ANC retrospective record reviews did not collect information on when the prior negative test was conducted, so these results do not take into account women who might not yet eligible for retesting. All of the retested clients from both countries were negative.

Retrospective review of L&D records showed that 63% (Uganda) and none of the Kenyan women eligible for retesting were offered an HIV test, with all of those who accepted the retest in Uganda having negative results. Among Kenyan women who were negative on admission but for whom information on eligibility for retest was not documented, two were retested negative, and two refused the retest and were

⁹ Ugandan women were not asked this question, and it was asked for around half (37 out of the 80) of the interviewed clients in Kenya for further understanding of the women's knowledge about their HIV status.

¹⁰ Whether the women were tested or not was not collected, however, it is assumed that they were.

¹¹ Antiretroviral Drugs for Treating Pregnant Women and Preventing HIV Infection in Infants. Recommendations for a Public Health Approach. 2010 version.

referred for other HIV services.¹² Among records reviewed where the HIV status was unknown on admission, there was documentation that 2 (Uganda) tested negative and no documentation that any of the Kenyan women for whom admission status was unknown were offered the HIV test (**Table 3**).

Final HIV status: The final HIV status was known for 92% (Uganda) and 93% (Kenya) the women whose records were retrospectively reviewed. However, at the time of delivery, 27% (Uganda) and 56% (Kenya) of the women whose L&D records were reviewed did not have a current HIV test result recorded—that is they were negative on admission but should have been retested (it was documented that it had been 3 months since their prior test) but had no retest results or the admission HIV status or eligibility for retesting was unknown.

Table 3: Record review documentation for labor and delivery: HIV testing and status for women

| | Indicator | Uganda | Kenya |
|--|--|-------------|----------------------------|
| A | HIV status documentation on admission | (n=247) | (n=262) |
| | Positive ¹ | 53% (n=132) | 41% (n=108 ¹³) |
| | Negative | 38% (n=94) | 52% (n=136) |
| | Eligible for retest (3 months since prior negative test) | 17% (n=16) | 9% (n=12) |
| | Not eligible for retest | 29% (n=27) | 4% (n=5) |
| | Don't know eligibility | 54% (n=51) | 88% (n=119) |
| | Status not known on admission | 9% (n=21) | 7% (n=18) |
| B | Testing during this admission (among all eligible for retest or whose status/retest eligibility was unknown) | | |
| | Women negative on admission and eligible for retest (prior test 3 or more months ago) | (n=16) | (n=12) |
| | Eligible and refused HIV test | 13% (2/16) | 0% |
| | Eligible and retest result negative | 63% (10/16) | 0% |
| | Eligible and no evidence retest was offered | 25% (4/16) | 100% (12/12) |
| | Women negative on admission but no documentation of eligibility for retest | (n=51) | (n=119) |
| | Negative on admission, retested negative | 20% (n=10) | 2% (n=2) |
| | Negative on admission, refused retest | 0% | 2% (n=2) |
| | Status not known on admission | (n=21) | (n=18) |
| | Status not known on admission and tested negative | 10% (n=2) | 0% |
| | Status not known on admission and refused test | 5% (n=1) | 0% |
| C | Final documented HIV status | (n=247) | (n=262) |
| | Positive ¹ | 53% (n=132) | 41% (n=108) |
| | Negative status within past 3 months | 39% (n=96) | 52% (n=136) |
| | Negative status more than 3 months prior or time negative status established is unknown [status not current] | 19% (n=47) | 49% (n=129) |
| | No HIV status recorded | 8% (n=19) | 7% (n=18) |
| ¹ The rate of positivity is biased as this was a select sample that included records of HIV positive women (52% of Ugandan ANC records and 42% of Kenyan records). This was to ensure an adequate sample for assessing services for HIV positive L&D clients. | | | |

¹² Data response says these women were referred for ART because the facility did not have the ART, but since these women were not tested positive, it is likely they were being referred for the HIV test or for further counseling to encourage the test.

¹³ One woman was recorded as status unknown but also as on life-long ART prior to admission, plus infant was treated as exposed infant, so status was corrected to be positive on admission.

Partner testing for ANC or L&D clients: Reviewed ANC client records had documentation that 32% (Uganda) and 11% (Kenya) of the ANC clients' partners were counseled about HIV, with almost all of these either accepting the test or already aware of their HIV status. Among those counseled, 41% (Uganda) and 53% (Kenya) were documented HIV-positive, 58% (Uganda) and 40% (Kenya) were documented HIV-negative, and 1% (Uganda), 6% (Kenya) documented as refusing the test. Among the partners who were counseled for an HIV test, 49% (Uganda) and 83% (Kenya) were partners of HIV-positive women (**Table 4**).

Kenyan clients whose ANC visit was observed were also assessed for information about the HIV status of the woman's partner. Among women newly diagnosed HIV-positive during the observation (only one of 15 was asked about her partner status), the partner was negative.

On admission for delivery, among a subset of interviewed Kenyan women (n=37),¹⁴ 51% reported they knew their partner's HIV status. Among the 49% who did not know their partner's HIV status, 5% (n=1) reported they were offered the opportunity for their partner to be tested.

Table 4: Assessment of partner HIV status

| A | | (n=357) | |
|---|--|-----------|----------|
| | Documentation of partner HIV counseling/assessing status | 32% | 11% |
| | Result for partners counselled/tested | (n=116) | (n=53) |
| | Partner declined test | 1% | 6% |
| | Partner tested did not receive results | 0% | 0% |
| | Partner HIV positive | 41% | 53% |
| | Partner HIV negative | 58% | 40% |
| B | Partner status for observation of ANC service provision | Not asked | (n=144) |
| | Health worker asked partner HIV status | | 1% (n=1) |
| | Partner is HIV positive | | 0% |
| C | Interviewed L&D client responses to questions about partner HIV status | Not asked | (n=37) |
| | Knew status of partner | | 51% |
| | Service provider asked status of partner | | 0% |
| | Partner status unknown | Not asked | (n=18) |
| | Service provider offered HIV test for partner whose status was unknown | | 5% (n=1) |

HIV testing for children under 5 years old: Most (95% Uganda and 73% Kenya) outpatient child health care providers reported that they assess risk of HIV infection for the mothers of sick children, with the same percentage of Ugandan but 45% of Kenyan service providers reporting they routinely assess risk of sick children for HIV. Asked about their comfort level in providing HIV services for children, most service providers reported they felt somewhat comfortable (47% Uganda and 45% Kenya) or very comfortable (32% Uganda and 55% Kenya), although only 26% (Uganda) and 27% (Kenya) of the child health service providers reported they had received training in screening, treatment, or counseling related to HIV infection in children. Fifty-eight percent (Uganda) and 55% (Kenya) of respondents reported they use guidelines for providing HIV services for sick children.

¹⁴ Ugandan women were not asked this question, and it was asked for around half (37 out of the 80) of the interviewed clients in Kenya.

Record reviews of outpatient visits of sick children showed that the assessment of HIV testing status (or provision of HIV tests) was documented for only two of 737 (0%) Ugandan and three of 786 (0%) Kenyan children.

Among the 22 (Uganda) and 68 (Kenya) observed consultations for sick infants (less than two months old) 14% (Uganda) and 54% (Kenya) of the mothers were asked if they had ever had an HIV test with fewer (0%, Uganda and 44%, Kenya) observed being asked if their infant had ever had an HIV test. Assessment of HIV status was similar for observed consultations for sick children (from two months to five years old), with 3% (Uganda) and 40% (Kenya) of the mothers observed being asked if they had ever had an HIV test, and 1% (one mother from Uganda) and 39% (Kenya) asked if their infant had received an HIV test. **Annex Table 16** provides further details related to HIV services for infants and young children.

HIV testing and adolescent health services: Although adolescent health service providers reported they do provide counseling for HIV testing (46% Uganda and 78% Kenya) and make referrals for testing (7% Uganda and 52% Kenya), most interviewed adolescents (79% Uganda and 91% Kenya) knew where they could get an HIV test if they wanted. Most interviewed adolescents (89% Uganda and 54% Kenya) were at the facility for ANC services, so their responses would reflect PMTCT services. (**Annex Table 17** provides further details on adolescent service provider responses, **Annex Table 19** provides further details on adolescent responses, and **Annex Table 18** provides further information on the adolescents who were interviewed).

B. ART during ANC, L&D, and postpartum

Both Uganda (in 2012)¹⁵ and Kenya (in 2016)¹⁶ have officially adopted the WHO recommendation for PMTCT¹⁷ that all HIV-positive pregnant women be enrolled in life-long ART, if possible, irrespective of CD4 cell levels, clinical stage, age, or breastfeeding status.

All assessed Kenyan facilities (n=11) and 90% of Ugandan facilities (9 of 10) had the first line three-drug maternal ART regimen (TDF/3TC/EFV) available in any formulation, with almost all the one tablet formulation (**Annex Table 22**).

Maternal ARV during ANC: Essentially all ANC service providers (95% Uganda and 90% Kenya) reported that they start ART for HIV-positive ANC clients, with 62% (Uganda) and 40% (Kenya) of these reporting that their method for providing the ART is routine referral of the patient to HIV clinic for life-long ART. Referrals may have been to different providers/units within the same facility or to another facility. In lower health facilities in Uganda, the PMTCT early infant diagnosis (EID) services are integrated within the MCH section, with ANC/maternity and PMTCT services offered in the same space and often by the same midwife, so for these cases referral for ARV during pregnancy would not be needed.

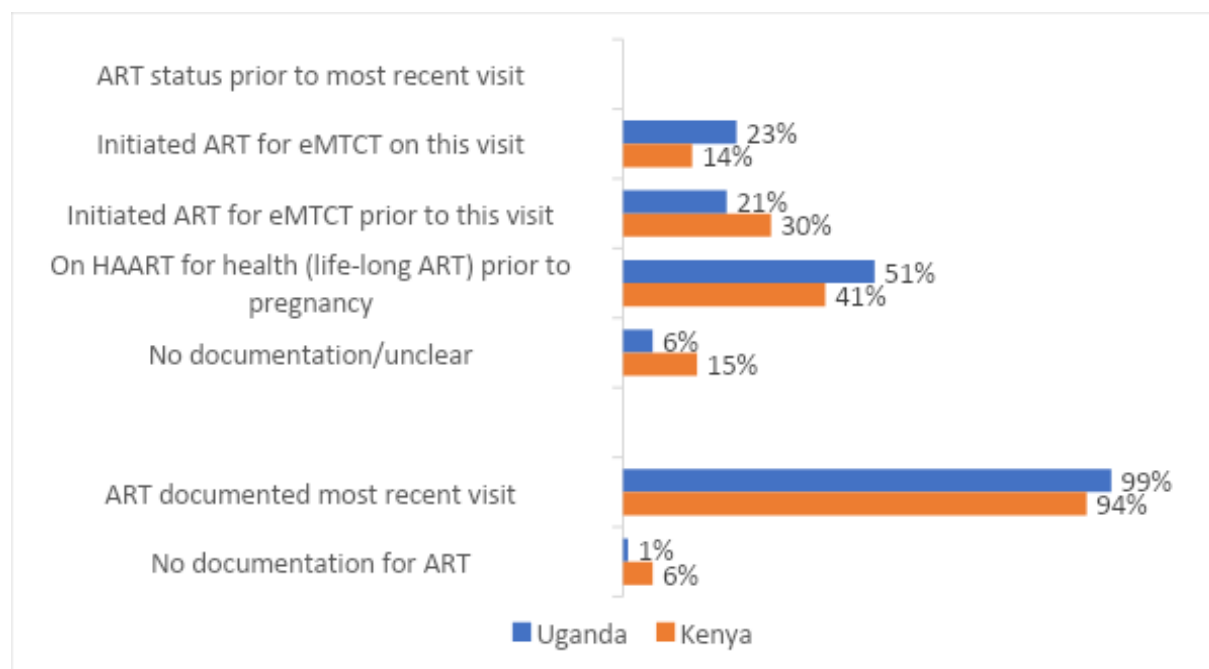
According to a retrospective review of ANC client records, almost all (99%) HIV-positive pregnant Ugandan women were enrolled in the three-drug ART regimen (as per Ugandan protocol), with 51% having been on HAART for their own health prior to their pregnancy. The Kenyan PMTCT protocol is also to provide the three-drug ART regimen, and 94% of the Kenyan women were on an ART regimen. However, recording of the exact ART regimen women were on was unclear based on the medical documentation review. Forty-one percent of the Kenyan women were on HAART for their own health prior to their pregnancy (**Figure 1**).

¹⁵ Consolidated Guidelines for Prevention and Treatment of HIV in Uganda. MOH, Uganda. November 2016.

¹⁶ Guidelines on Use of Antiretroviral Drugs for Treating and Preventing HIV Infections in Kenya, 2016 Edition.

¹⁷ Use of Antiretroviral Drugs for Treating Pregnant Women and Preventing HIV Infection in Infants. Executive Summary. WHO HIV Programme. April 2012 Programmatic update.

Figure 1: Record review: ART status and regimen for HIV positive ANC clients whose records were reviewed (Uganda n=160, Kenya n=163)



The assessment findings corroborate with SIMS data from selected study sites, reporting high level of performance on ART for HIV-positive pregnant women, indicating that all HIV-infected pregnant women have documented prescription of ART within two months of a SIMS visit.

Maternal ARV during L&D: L&D records reviewed retrospectively for HIV-positive women (a different sample from the ANC retrospective record reviews) documented similar percentages to those seen for ANC clients of women who had been on HAART prior to becoming pregnant (36% Uganda and 51% Kenya). The admission ARV status was not documented for 19% (Uganda) and 28% (Kenya) of the women who were documented HIV-positive on admission (**Figure 2**).

Almost all (99%) HIV-positive pregnant Ugandan women and 67% of Kenyan HIV-positive women with retrospective record reviews were documented to be on three-drug ART at discharge. The specific ART regimen had been unclear in Kenyan ANC records, but was clearer in the Kenyan L&D records. There continued to be, however, a number of women--9% (n=12) for Uganda and 7% (n=8) for Kenya--who were documented on ART but whose specific regimen was not clearly recorded.

Among the subset of L&D clients whose admission process was observed (n=42 for Uganda and n=8 for Kenya), two Ugandan and one Kenyan woman were identified as HIV-positive. Among these, the observer noted no follow-up information relevant to the HIV-positive status assessed for the Kenyan woman. The ARV status for the two Ugandan women was assessed, and one reported she had not received ARV during pregnancy. The service provider explained why women should take ARVs (whether she received nevirapine during labor was not collected). All three positive clients were observed being told by service providers when and how their newborn should take ARV (**Annex Table 13**).

SIMS data from selected study facilities, where information was available, confirmed strong to satisfactory performance on routine provider-initiated testing and counseling, ART for HIV-infected women, and ARV prophylaxis for their exposed infants in the maternity.

ARV for the exposed infant: Ninety-one percent of Kenyan facilities had both nevirapine and zidovudine syrup (the first line infant prophylactic regimen for Kenya) but only 80% (Uganda) had nevirapine syrup (the first line infant prophylactic regimen for Uganda) for exposed infants available.

Record reviews of women whose L&D records were reviewed also assessed documentation of postpartum ARV for the exposed infant.¹⁸ Among retrospective record reviews for exposed infants, administration of the infant ARV post-delivery was recorded for 95% (Uganda) and 80% (Kenya) of the infants (**Figure 3**). An additional 5% of Kenyan women with their infants were referred for ART.

Figure 2: Record Review: ART status and regimen for HIV positive L&D clients whose records were reviewed (Uganda n=132, Kenya n=108)

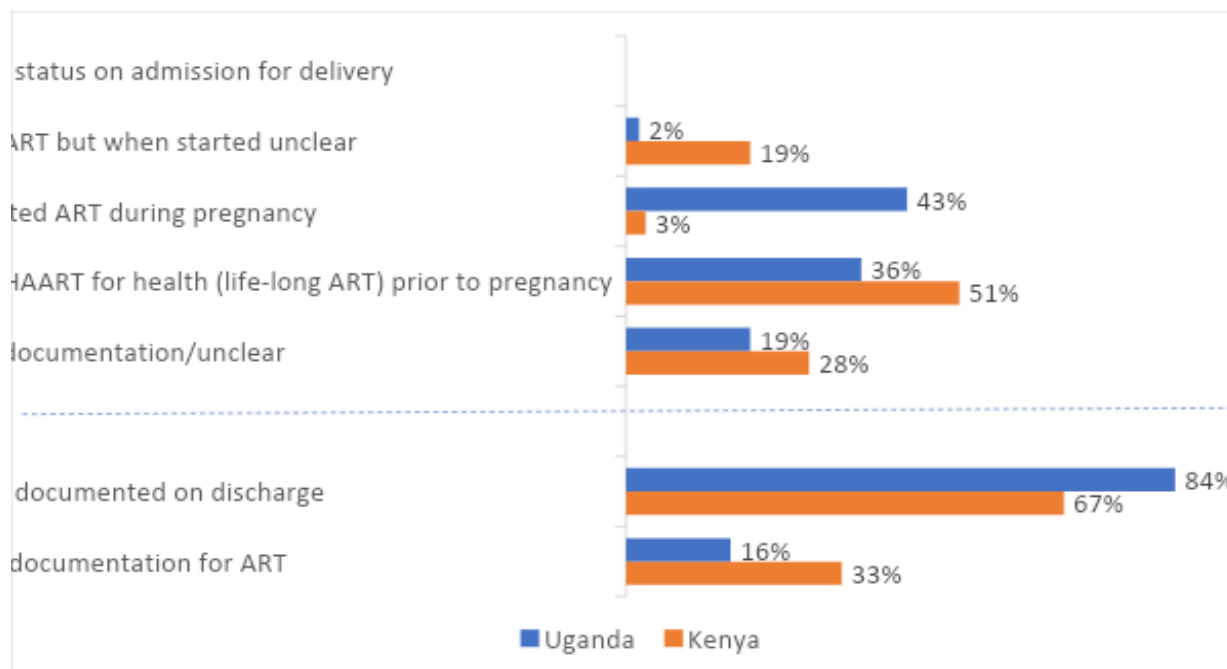
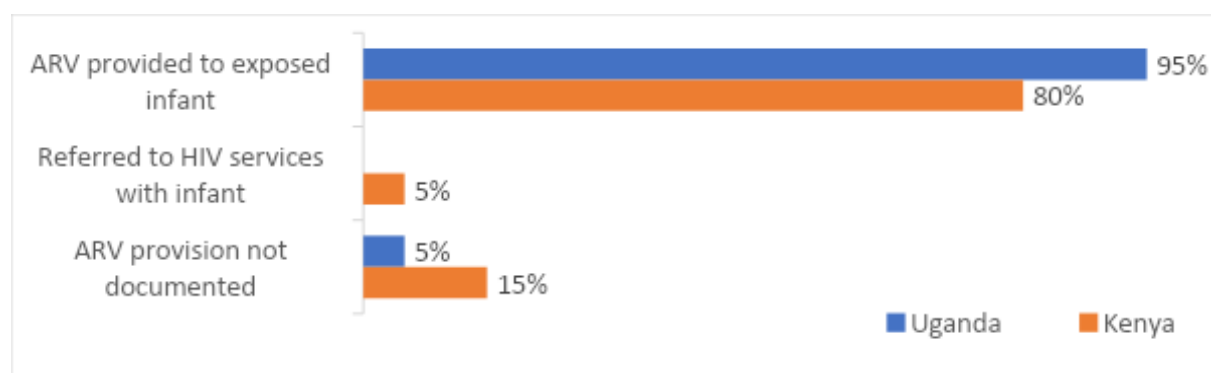


Figure 3: Record review L&D: Exposed infant ARV status and regimen (Uganda n=132, Kenya n=108)



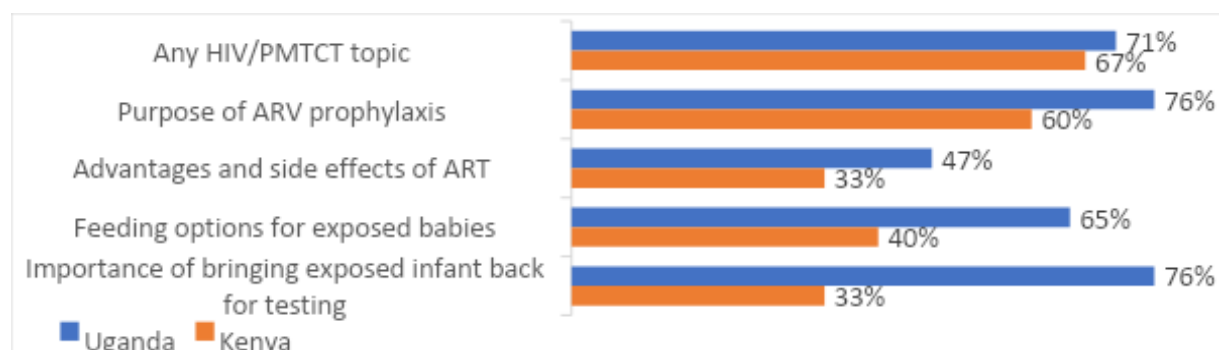
¹⁸ Infants born to HIV-positive women.

C. HIV-positive patient follow-up and counseling

Counseling: Asked (with no prompted responses) to identify the most critical issues for counseling ANC clients, 57% (Uganda) and 20% (Kenya) of ANC service providers identified PMTCT and HIV testing (**Annex Table 9**). Among observed ANC visits, a number of clients (n=17 for Uganda and n=15 for Kenya) were newly diagnosed HIV-positive during the observed visit. Among these, 76% (Uganda) and 60% (Kenya) were counseled about the purpose of ARV prophylaxis. Counseling about PMTCT issues for the exposed infant was more commonly observed for Ugandan (76%) than Kenyan women (33%) (**Figure 4**).

Whether information on the ARV regimen for exposed infants, adherence, and involvement of the client and their partner in their care, including partner HIV status, were discussed were also assessed during ANC observations in Kenya in six facilities. None of these topics were observed being discussed with the newly diagnosed HIV-infected women in the selected Kenyan facilities. **Annex Table 10** provides further details on counseling for newly diagnosed HIV-positive observed ANC clients.

Figure 4: Counseling provided to newly diagnosed HIV infected pregnant women whose consultation was observed (Uganda n=17, Kenya n=15)



Family planning and safe sex: None of the Ugandan and 10% of Kenyan ANC service providers identified safe sex as an important topic for ANC PMTCT counseling, however, among HIV-positive women whose ANC records were reviewed, 80% (Uganda) and 77% (Kenya) had documentation of being counselled to use dual protection (use a condom or condom plus another method to prevent HIV transmission) for birth control, which covers both family planning and safe sex. **Annex Table 9** provides further details on ANC service provider responses for HIV services.

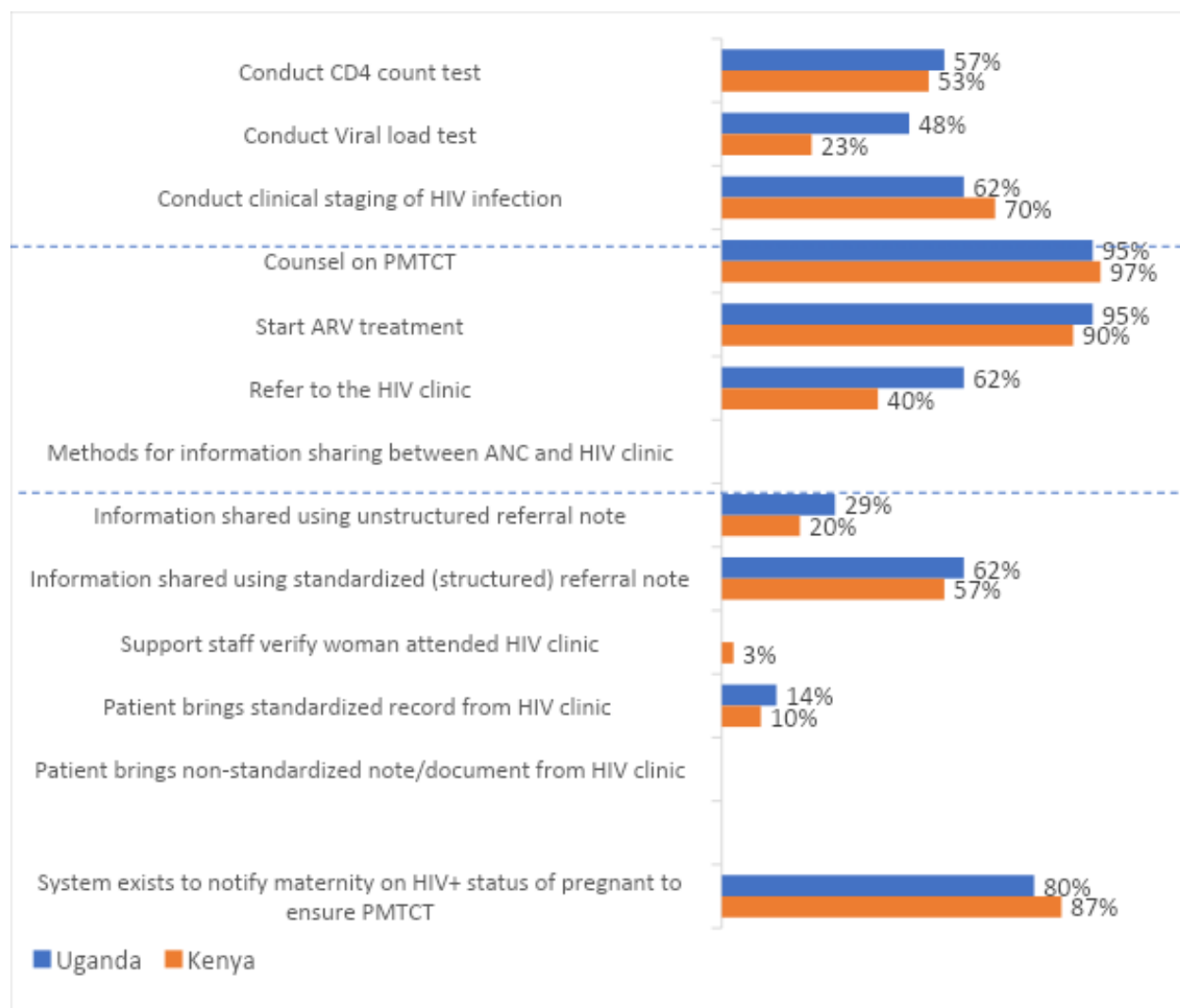
L&D record reviews documented that FP counseling was provided for 63% (Uganda) and 18% (Kenya) of HIV-positive women and counseling about safe sex for 41% of Ugandan, but none of the Kenyan women. Referral for FP services was documented for 14% of Ugandan and 32% of Kenyan women. None of the Kenyan women had information on a method chosen for contraception documented. A method of choice, however, was documented for 51% of Ugandan women. The methods chosen were lactational amenorrhea (LAM) plus condoms (42%) and LAM alone (9%). Half of the Ugandan women with referral documented had chosen either LAM or LAM plus condom prior to discharge (**Annex Table 15**).

Infant feeding: Mixed feeding (breastfeeding with supplements) increases the risk of infants contracting HIV from infected mothers. Early initiation of breastfeeding, exclusive breastfeeding for six months, and maintaining breastfeeding for up to 24 months or longer (similar to the general population) is the recommended practice for HIV-exposed infants. However, counseling on early initiation and exclusive breastfeeding was only reported as a priority topic for counseling by 5% (Uganda) and 27% (Kenya) of ANC service providers (**Annex Table 9**) and counseling on infant feeding practices by 10% (Uganda) and 18% (Kenya) of newborn care respondents. Among exposed infants, 96% (Uganda) and 77% (Kenya) were documented as being breastfed, with another 3% of the Kenyan infants documented as exclusively

receiving replacement feeding (e.g., formula). The remaining infants (4%, Uganda and 20%, Kenya) had no documentation of their feeding status at discharge (**Annex Table 15**).

Follow-up of the HIV-positive woman on ART: With regards to follow-up on the effectiveness of ART, more than half (57% Uganda and 53% Kenya) of ANC service providers reported that they routinely perform CD4 or viral load tests for HIV-positive patients. Additionally, 62% (Uganda) and 70% (Kenya) reported they routinely perform clinical staging for HIV infection (**Figure 5**).

Figure 5: ANC service provider reported routine practices when HIV-positive ANC clients are identified (Uganda n=21, Kenya n=30)



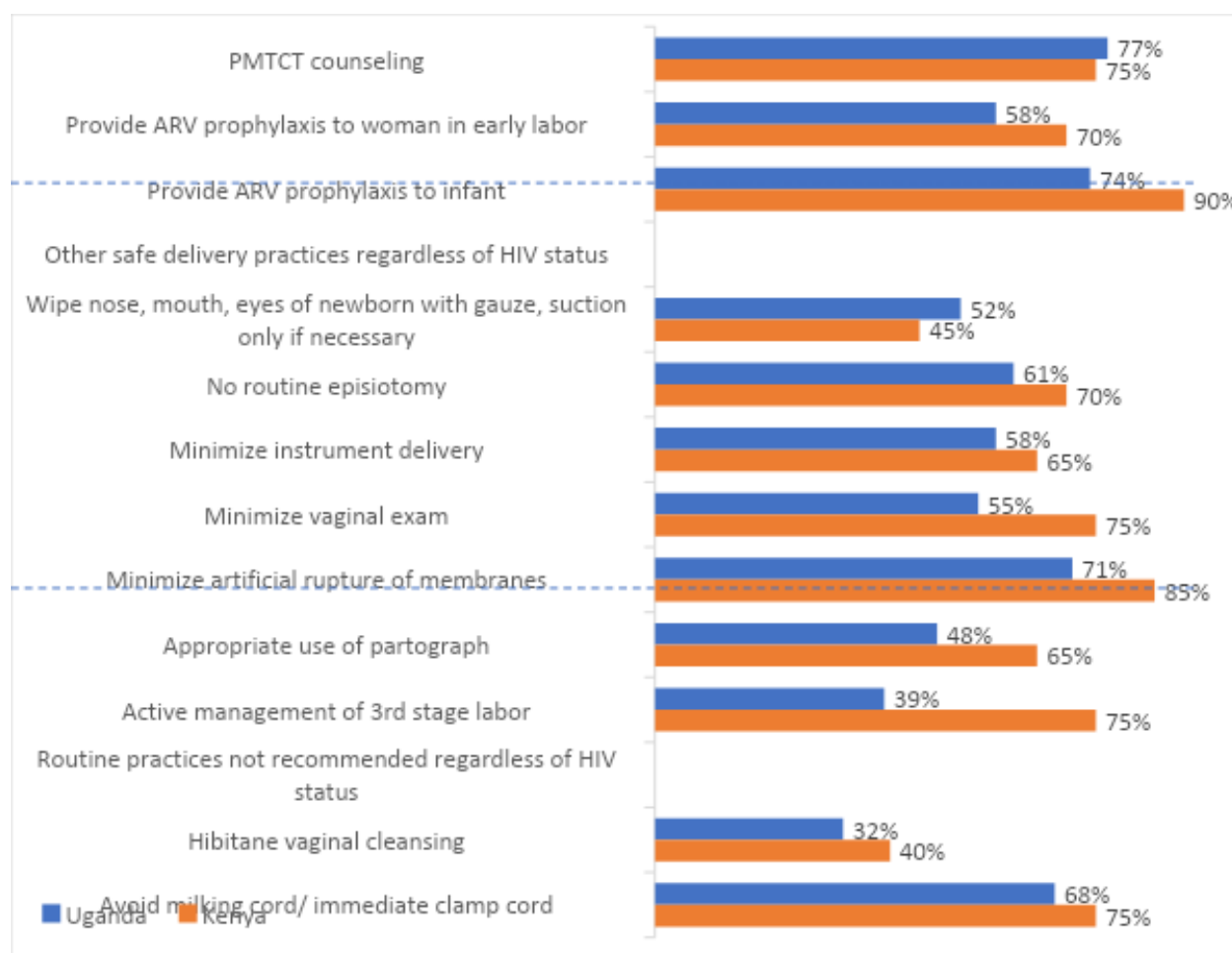
Among the HIV-positive women whose ANC records were reviewed, 62% (Uganda) and 73% (Kenya) had their staging documented, 3% (Uganda) and 28% (Kenya) had a CD4 count recorded, and none of the Ugandan but 36% of the Kenyan records reviewed had a viral load recorded. Among all HIV-positive women, 3% (n=3) of Ugandan and 6% (n=10) of Kenyan women had a CD4 < 350. In total, 3% of Ugandan (n=4) and 14% of Kenyan women had evidence of severe/advanced HIV.¹⁹ **Annex Table 11**

¹⁹ CD4 count <350 cells/mm³ or WHO clinical stage 3 or 4.

provides further details on ANC record reviews and client testing, and **Figure 12** provides information on availability of laboratory tests for monitoring clients on ART for Kenya.²⁰

Safe delivery practices: When provided with a list of actions and asked which of these were important PMTCT interventions for HIV-positive women during L&D, 50% (Uganda) and 70% (Kenya) appropriately identified providing antiretroviral prophylaxis to the woman, 74% (Uganda) and 90% (Kenya) identified providing ARV to the infant, and 77% (Uganda) and 75% (Kenya) identified counseling on PMTCT (**Figure 6**). Around half or more also identified general safe delivery practices relevant for PMTCT (e.g., no routine episiotomy, minimize vacuum or forceps, minimize vaginal examinations, active management of the third stage of labor). A substantial proportion also identified practices that are not recommended for delivery, regardless of HIV status (e.g., hibitane vaginal cleaning). **Annex Table 12** provides further details on L&D service provider knowledge about HIV services.

Figure 6: L&D service providers: Reported actions for PMTCT during L&D (Uganda n=31, Kenya n=20)



²⁰ This information was added to the six Kenyan facilities late in the survey.

D. Information sharing and coordination for follow-up of HIV-positive pregnant women and exposed infants throughout the care continuum

Information sharing practices: All ANC service provider respondents were asked to describe their practices in sharing patient information if they refer a patient to an HIV clinic (i.e., for life-long ART). Over half (62% Uganda and 57% Kenya) of respondents reported that they send patient information using a formatted referral form with preprinted guidance for information required as per the PMTCT and ART protocol. An additional 29% (Uganda) and 20% (Kenya) reported they use a referral form without any preprinted format (**Figure 11**). Few ANC service providers (4% and 10% for Uganda and Kenya, respectively) reported that they receive feedback from the HIV clinic to verify the woman started life-long ART. Almost all interviewed ANC care providers (80% and 87% for Uganda and Kenya, respectively) did report they have systems to notify maternity about the HIV-positive status of pregnant women for PMTCT follow-up, although no examples of the systems used were provided.

A systematic process for tracking HIV-positive patients and exposed infants across the care continuum, and for identifying barriers to continuity in care is important to ensure adherence to treatment and care outcomes.

To provide a more in-depth picture of follow-up practices among HIV-positive patients, additional information was collected from key informants in six of 11 Kenyan facilities about facility processes for promoting information sharing and adherence (**Table 7**). Among the facilities reporting they had systems for supporting patients and case detection of family members, few provided information on a specific system for patient follow-up; rather, they described the services available. For example, among the five facilities where a system for testing/assessing family members of a positive patient existed, the one specified response was that HIV testing was offered. Although all six facilities reported they have systems to link with community care and support services, only one reported having a standardized system for sharing information or tracking patient compliance in accessing the community referrals. The one facility that reported they track if the patient follows through on referral to link HIV-positive patients with community care and support services also had observed documentation showing that the system is functional.

Five of the six Kenyan facilities where additional information on systems was assessed were reported to have systems to support adherence to the ART regimen, including systems to follow up patients who miss appointments (**Table 5**).

Table 5: Facility-level systems and written guides to promote information sharing and adherence to HIV services and treatment regimens, reported by Kenyan facility respondents

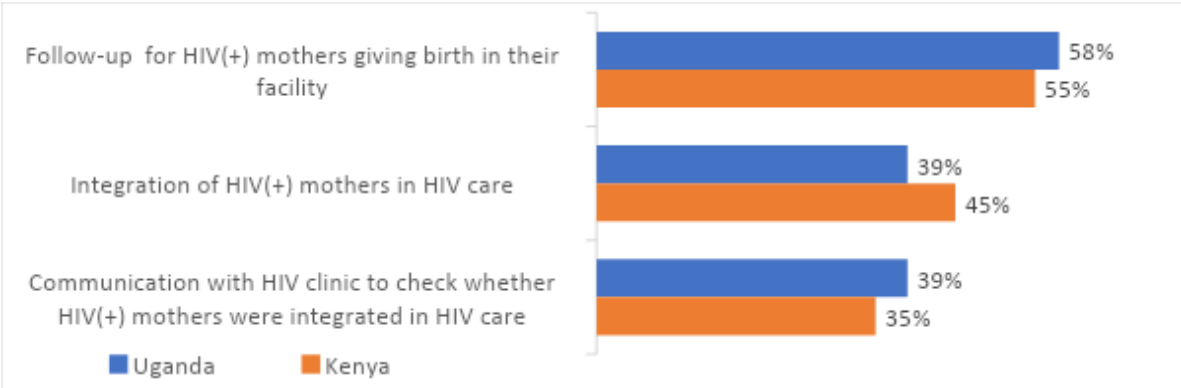
| Systems or guides in place | | Facilities (n=6) | |
|----------------------------|--|------------------|----|
| | | YES | NO |
| A | Systems to support specific categories of patients for care and follow-up | | |
| | System for testing/assessing family members for HIV status | 5 | 1 |
| | Systems to link with community care and support services | 6 | 0 |
| | Standardized documentation of referrals of PLHIV to community services | 1 | 5 |
| | System for tracking if the patient accessed the referral service or not | 1 | 5 |
| | Documentation that staff review the referral information for improving linkages | 1 | 5 |
| B | Written procedures or algorithm for patient follow-up | | |
| | Newly identified HIV-positive pregnant women or mothers at ANC or maternity service delivery points for follow-up HIV services (e.g., PMTCT) | 4 | 2 |
| | HIV-exposed infants for follow-up services (DNA PCR testing, cotrimoxazole preventive therapy) | 5 | 1 |
| | HIV-positive pediatric patients | 5 | 1 |

| Systems or guides in place | | Facilities (n=6) | |
|----------------------------|--|------------------|----|
| | | YES | NO |
| C | Facility providing ART has | | |
| | The adherence support system in place | 5 | 1 |
| | Adherence counseling prior to ARV treatment initiation | 5 | 1 |
| | Routine adherence assessment during ART | 5 | 1 |
| | Counseling interventions for patients (or caregivers) with poor adherence | 5 | 1 |
| | Follow-up for all HIV-positive clients on ART to respond to the results of CD4 and/or viral load tests | 2 | 4 |
| | Follow-up for all HIV-positive clients (including pregnant women, mothers, children, adolescents, and HIV-exposed infants) who defaulted on their ART appointments | 5 | 1 |

Follow-up of HIV-positive ANC clients for ARV intervention: Four of the six Kenyan facilities where information was collected about follow-up systems were reported to have written procedures or algorithms for tracking HIV-positive women for follow-up of HIV services. Three of these described the procedure was implemented using community health workers, and one simply indicated that the follow-up procedure is through maternal care services.

Providers of delivery services reported systems for follow-up of HIV-positive mothers who delivered in their facilities in similar proportions (**Annex Table 12**) (**Figure 7**). Among interviewed childbirth care providers, more than half (58%, Uganda and 55%, Kenya) reported existence of a system for follow-up of HIV-positive women after giving birth, with 39% (Uganda) and 45% (Kenya) describing a system for integrating these women into HIV care. Feedback for whether the women were integrated into HIV care was reported to be systematically received by 39% (Uganda) and 35% (Kenya) of providers. Among the providers reporting a feedback system, the processes used included using community health volunteers and mentor mothers to track the women and to accompany them to the referral clinic. In addition, both the referring and receiving clinics were reported to write information in records kept by the mother.

Figure 7: Providers of delivery care who could describe facility systems for following up HIV-positive women (Uganda n=31, Kenya n=20)

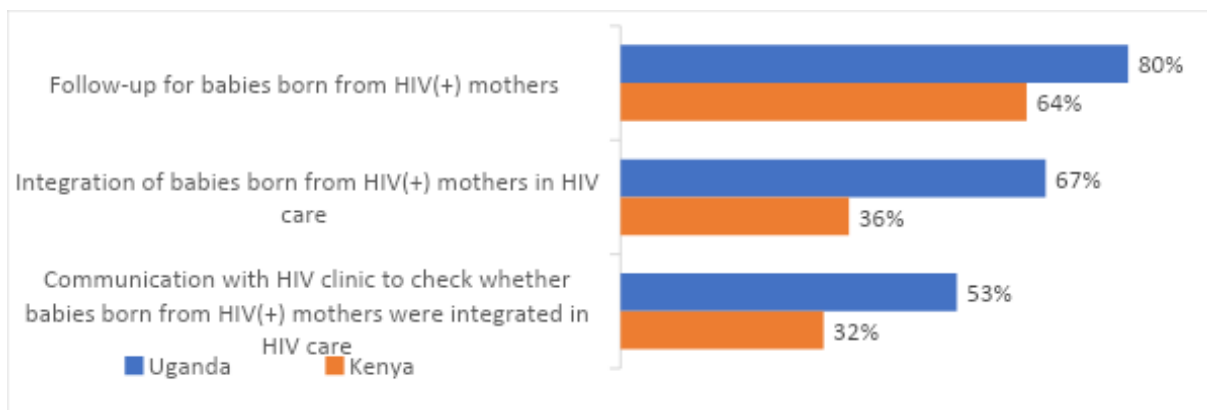


SIMS data indicate variable practices of maintaining current individual patient/beneficiary records with adequate and secure storage in ART/pre-ART or PMTCT facilities, with two facilities where the practice required urgent remediation. Similarly, four out of six surveyed facilities required improvement in identifying and tracking HIV-positive pregnant women on ART who have defaulted on their appointment, while better performance was reported on availability of ART adherence support systems at ANC clinics.

Follow-up of exposed infants for PMTCT services: Five Kenyan facilities reported a written procedure for tracking HIV-exposed infants for follow-up services. When asked to describe the procedure, however, only two reported they have specific registers for identifying and following up on defaulters, and two simply mentioned general registers.

Ugandan providers of infant care were better able to describe their facility systems for infant follow-up than the Kenyan providers (**Figure 8**). Similar to the follow-up systems for HIV-infected mothers, general systems for follow-up of exposed infants rather than systems for specifically tracking if the patient actually follows through on referral/attends clinics were described. Among the Ugandan infant care providers who described any system for exposed infant follow-up, almost all outlined the follow-up required for the infant (give NVP prior to discharge and tell the mother to return in six weeks for infant blood test for early infant diagnosis of HIV). Only 11 providers mentioned the EID clinic, with half of these mentioning an EID cohort register. Three Ugandan providers described making home visits or phone calls to the infant caregiver if needed to ensure follow-up, and one mentioned that there were appointments for the infant blood test. Similarly, among the Kenyan respondents reporting a system for exposed infant follow-up, most described the care and follow-up needed, with three mentioning using community health workers or mentor mothers to ensure enrollment of the infant in care.

Figure 8: Providers of newborn care: Description of facility systems for exposed infant follow-up for PMTCT (Uganda n=30, Kenya n=22)



Follow-up of HIV-positive pediatric patients: Five Kenyan facilities reported to have a written procedure for tracking HIV-positive pediatric patients for follow-up, but according to SIMS data, three out of five study facilities in Kenya required improvements in HIV-exposed infant testing. When asked to describe the procedure, three facilities reported that they use community health workers for follow-up, and one simply mentioned a register.

PrEP: Kenya introduced pre-exposure prophylaxis (PrEP),²¹ a preventive treatment provided when a person is at risk of exposure to HIV, including for pregnant women, in July 2016.²² At the time of the assessment, Uganda had not yet introduced PrEP other than through special testing/demonstration sites.

Information on PrEP was collected from a subset (six of 11) of the Kenyan facilities, and 17 interviewed providers.²³ Among the interviewed care providers, 65% reported they provide PrEP services, and 82%

²¹ WHO ANC guidelines recommend tenofovir disoproxil fumarate (TDF) for preventive ARV for persons at high risk for HIV (PrEP), including pregnant women and the PrEP regimen in Kenya is TDF+ Emtricitabine (FTC) or only TDF.

²² More than half of the interviewed service providers were from one referral hospital.

²³National AIDS & STI Control Programme (NASCOP), Ministry of Health, (2017). Framework for the Implementation of Pre-exposure Prophylaxis of HIV in Kenya, Nairobi, Kenya: NASCOP.

reported their facility has a system in place to implement PrEP, however, none provided an example of the system. Recent training in PrEP was only reported by 18% of the respondents (**Figure 9**). Information was not collected on whether TDF was provided for women or not; however, 10 of 11 Kenyan and six of 10 Ugandan facilities had either TDF+FTC or TDF in stock (**Annex Table 20**).

Figure 9: Kenyan ANC service provider responses about PrEP services (n=17 providers from 6 facilities)



During the observed ANC consultations for Kenya, 7% (one of 15) of the HIV-positive women was asked about their partner's HIV status;²⁴ this partner was not HIV-positive. PrEP for their partner was not discussed with any of the HIV-positive women (**Annex Table 14**).

E. Adolescent health services

Most providers who responded to questions on adolescent health services are providing these as a part of their general ANC, L&D, or curative care services. Counseling adolescents about HIV was reported as a routine service by 64% (Uganda) and 74% (Kenya) of the respondents who reported they provide any services for adolescents, and clinical management for HIV-infected adolescents was reported as a service provided by 57% (Uganda) and 74% (Kenya) of the respondents (**Annex Table 17**). Kenyan providers were asked to describe measures they take for transitioning HIV-positive adolescents to adult HIV services. Among the 33% (n=7) of Kenyan providers responding to the question, three mentioned peer support linkages, one stated that adolescents and adults use the same clinic, and five mentioned general "counsel and refer" practices.

Ninety-three adolescent clients from Uganda and 13 from Kenya (aged 10-19 years old, having at least one medical visit in the facility, and agreeing to participate) were interviewed for general health information and knowledge, and a few more (n=95, Uganda and n=14, Kenya) about HIV-specific issues. Most of the adolescents (89% from Uganda and 54% Kenya) were at the facility for ANC services. An additional 9% (Uganda) and 46% (Kenya) were seeking care for an illness. **Annex Table 18** provides further details on characteristics of adolescent respondents.

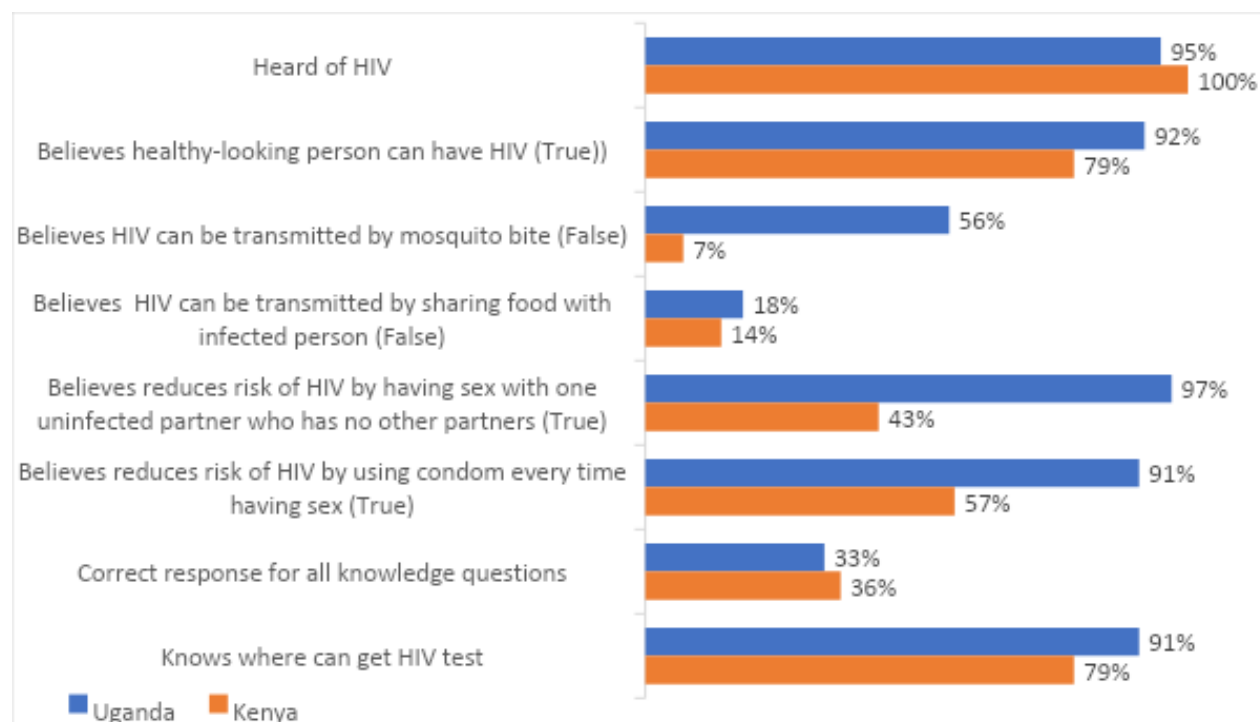
Adolescents receiving services were interviewed for their general awareness and knowledge about condoms and HIV services.

Prevention by use of condoms: Ninety-five Ugandan and 14 Kenyan adolescents responded to general questions related to condoms. Only 24% (n=23) of Ugandan but 93% (n=13) of Kenyan respondents said they had heard about condoms. Among these, 74% of the Ugandan and 77% of Kenyan respondents identified preventing HIV or other STIs as reasons to use condoms, and 87% (Uganda) and 46% (Kenyan) could name a place where condoms were available, with fewer (83% Uganda and 27% Kenya) reporting they thought they could get a condom if they wanted one (**Annex Table 19**).

²⁴ This information was not collected during Ugandan ANC observations. It was only added for the defined HIV facility sample in Kenya.

Knowledge about HIV and HIV services: Adolescents were also asked about HIV and HIV services. Almost all respondents had heard of HIV, however, only 33% (Uganda) and 36% (Kenya) of respondents correctly answered all questions about transmission and prevention for HIV infection (**Figure 10**).

Figure 10: Adolescent respondent knowledge about HIV infection (Uganda n=95, Kenya n=14)



F. Supporting key inputs for quality integrated RMNCAH and HIV services

Provider training and use of guidelines: Training in HIV screening for PMTCT in the past 12 months was reported by 48% (Uganda) and 43% (Kenya) of providers of ANC services. Most providers of ANC services (81% Uganda and 87% Kenya) reported using PMTCT guidelines when providing services.

Task shifting: When asked about task-shifting practices for PMTCT services, around half of ANC service providers reported that the HIV test is performed by non-professional staff (57% Uganda and 47% Kenya), such as trained staff onsite, laboratory staff, or staff for HIV testing services. HIV testing for PMTCT was also reported to be offered through outreach services²⁵ by 86% (Uganda) and 77% (Kenya) of respondents.

Availability of antiretrovirals: All Kenyan facilities and 90% of Ugandan facilities had the first line ART regimen (TDF/3TC/EFV) for the mother available. Additionally, all Kenyan and 80% of Ugandan facilities had nevirapine syrup, but only 10% (Uganda) and 91% (Kenya) had AZT syrup available. **Annex Table 20** provides further details on availability of ARV drugs.

²⁵ Outreach services refers to facility staff providing services in fixed sites outside of the facility, usually closer to the population being served.

HIV testing conditions: All six facilities in Kenya where HIV testing conditions were assessed had an HIV testing site with visual and auditory privacy, and five of the six had the same for the PMTCT services, with one facility having only auditory privacy.

Availability of guidelines: Most assessed guidelines were observed to be available in five of the six Kenyan facilities where guideline availability was assessed (**Figure 11**).

Figure 11: Facility availability of guidelines related to HIV services (n=6 facilities in Kenya)

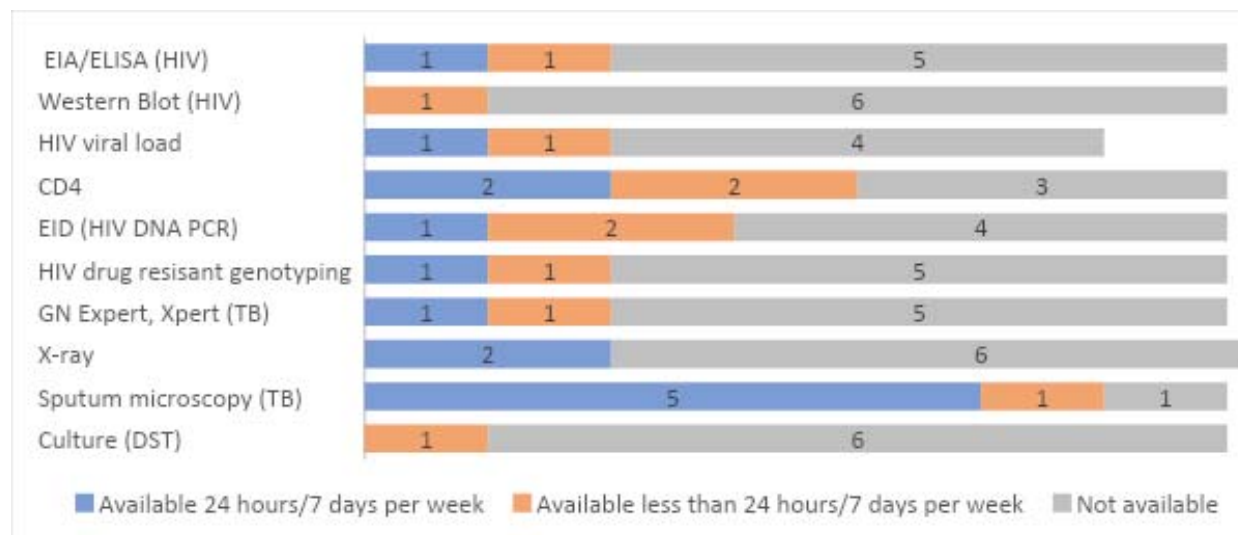


In addition, five of six facilities reported that at least one care provider had received training in the past 12 months in PMTCT; infant and young child feeding; HIV testing services; HIV prevention, care, and management for adolescents; ART prescriptions and management; clinical management of HIV; and PrEP.

Availability of diagnostic and monitoring tests: Information on laboratory tests relevant to diagnosing and monitoring HIV-infected patients was collected for the seven Kenyan facilities where additional HIV-related information was collected. These tests included HIV diagnostic testing (ELISA, Western Blot), monitoring HIV infection (viral load, CD4), diagnosis for infant HIV infection (PCR), and for drug resistance. The results of the tests that were assessed are rarely required on an emergency basis, so while 24/7 availability allows quicker results, the rapid turn-around is less important than general availability. These tests were not available in around half of the facilities (**Figure 12**). It is not uncommon for a facility to send blood specimens to another facility for ELISA, CD4, viral load, and drug resistance tests. Among the assessed tests, those that would be high priority for a facility treating patients with AIDS to provide onsite is viral load since timely results allow a rapid adjustment of treatment if needed. Rapid HIV testing was universally available in all 11 facilities in Kenya and 10 facilities in Uganda, with 24-hour access in 10 of the 11 Kenyan and eight of the 10 Ugandan facilities.

Viral load is an important measure for whether the ART regimen is effective. Reduction of the viral load depends on and is a critical measure of ART treatment adherence. If the viral load remains high, adherence needs to be assessed to determine if this is contributing to the lack of response to the ART regimen and whether revision of the ART regimen may be needed. As noted in **Figure 12**, only two out of the six facilities in Kenya assessed for HIV services had the availability of viral load testing.

Figure 12: Number of facilities with the indicated status for diagnostic tests (n=7 facilities in Kenya)



According to the results of recent randomized trials²⁶ demonstrating the clinical and public health benefits of starting ART as soon as possible after HIV diagnosis is confirmed, CD4 cell count is no longer recommended as a way to decide when to initiate ART. Also, for patients stable on ART, CD4 cell counts are no longer needed to monitor the response to treatment where HIV viral load testing is available. Nevertheless, CD4 remains the best measurement of a patient’s immune status, the risk of opportunistic infections, and supports diagnostic decision-making, particularly for patients with advanced HIV disease. Half of the facilities assessed for HIV-related laboratory diagnostics had the capacity to perform CD4 counts. This means for the other three facilities without CD4 capacity, that these blood tests are likely provided by other facilities with the results returned to the ART facility for patient follow-up days after the patient appointment when the blood was drawn. Only two of six facilities, however, reported having systems for follow-up with the patient to respond to results of viral load (or CD4) tests.

Availability of tests for tuberculosis (TB) diagnosis were also assessed (sputum microscopy, Genexpert, X-ray, and culture). Among these, sputum microscopy was available in six of the seven facilities (**Figure 12**). Infant blood is also frequently collected at a facility but sent to a higher-level facility for the actual HIV test (PCR).

General readiness of laboratory systems: SIMS data provide additional information about facilities’ readiness to manage information and data for specimen registration, results recording, and results reporting and availability of written SOPs for all core HIV-related tests they offer, routine quality control procedures, and provision of continuous services. These measures needed improvement in at least one out of five study sites, where SIMS data were available.

Other supporting inputs: According to SIMS data, significant gaps exist in availability of ART registers for general population and ANC sites. However, paper-based ANC register with PMTCT information was universally available in all study facilities. Data reporting consistency was also universally strong among all facilities, where such data was available. At least four out of the six health facilities reported strong supply chain management, effective medication dispensing practices, and commodities for early infant diagnosis, according to SIMS.

²⁶ https://www.who.int/hiv/pub/journal_articles/The_evolution_role_of_CD4_cell_counts_in_HIV_care.pdf

G. HIV-related services

Additional HIV-related services were asked about for the six Kenyan facilities where more in-depth information related to HIV services was assessed.

PMTCT: All six of the facilities reported their PMTCT services consists of the following package:

- **HIV testing:** Routine HIV counseling and testing of ANC women and women at delivery, HIV testing for the partner of the ANC client, counseling and testing for HIV-positive pregnant women, and follow-up of their infant.
- **Provision of ARVs for prevention and treatment:** PrEP for pregnant women at risk of HIV infection, ARV prophylaxis for HIV-infected women and their exposed infant, and ART during labor and delivery for HIV-positive women.
- **Counseling:** Counseling for maternal nutrition, infant/young child feeding, and FP.
- **Other interventions:** Cotrimoxazole prophylaxis for HIV-exposed infants.
- **Routine HIV testing of at-risk children:** Specific risk factors for children: with HIV-positive parents, with symptoms that may be related to HIV infection, with TB, who are inpatients, or who are attending malnutrition treatment.

Additional HIV services: The following services were also reported available in all six assessed Kenyan facilities:

- **HIV counseling and testing services for minor adolescents.**
- **ART and care and support services for HIV:** The majority of ART and care and support services for HIV were offered in the six facilities. The following services were reported offered by all six of the Kenyan facilities where additional HIV service information was collected:
 - *ART and care and support services* for mothers, exposed infants, and infected infants
 - *ART* for adolescents
 - *HIV treatment services:* Community-based care and support services, treatment for opportunistic infections and other HIV symptoms, palliative care, systemic intravenous treatment of specific fungal infections (e.g., cryptococcal meningitis), nutritional rehabilitation, isoniazid (INH) and pyridoxine TB preventive treatment, preventive treatment for opportunistic infections (e.g., cotrimoxazole).
 - *FP and safe sex:* FP counseling, safer contraception/pregnancy counseling for people living with HIV who want to have children, provision of condoms for preventing further transmission of HIV.
 - *HIV/TB coinfection diagnosis and treatment:* Routine screening for TB among HIV-infected adults and children, management of HIV/TB co-infection.

Services that were less commonly available in these six Kenyan facilities included voluntary medical male circumcision (17%), services for Kaposi's sarcoma (50%: 17% offered treatment and 33% referral for treatment), and prescriptions/provision of fortified protein supplementation (83%).

IV. DISCUSSION

Although knowledge and provider-reported practices for PMTCT services are high, there is evidence of weaknesses in program implementation and documenting information on various PMTCT services. This is particularly evident with regards to retesting negative women, assessing partner HIV status,

implementation of systems to track client linkages with relevant HIV services to which they were referred, and counseling for FP.

HIV testing: Although there is evidence from client interviews and observations of ANC services that essentially all ANC clients are tested for HIV at least once, a substantial percent of Kenyan ANC records (18%) did not have an HIV status documented at the most recent visit. As some (five Kenyan women) had documentation of being on ARV (and were subsequently reclassified as HIV-positive for this assessment analysis), this seems to be an issue with recording results and not testing.

Among women whose L&D records were reviewed (a different sample than used for ANC records) 8% (Uganda) and 7% (Kenya) did not have an HIV test result recorded at discharge after delivery. All facilities had the rapid HIV test available, however, it is important to determine if this test was available for deliveries occurring outside normal working hours. While this would not preclude testing the following day, it would potentially mean that previously not identified HIV-positive women would deliver without ARV preventive therapy being provided. The 41% of the Ugandan and 16% of the Kenyan women admitted for L&D for whom HIV status prior to admission was not known may include women who did not receive ANC services. This highlights the missed opportunities for HIV screening and testing when adolescents (most of whom will become mothers) and mothers seeking services for themselves or their children receive care when not pregnant. Similarly, a nationally representative survey from Uganda indicates a need to improve the first 90 target among women of reproductive age, especially among young women or those experiencing their first pregnancy (Uganda MOH 2019). HIV test status may have been on records the woman brought with her and took home, but the information should have been transposed to records maintained by the health facility, and the date of an HIV test should be recorded so that eligibility for retesting after a negative result can be assessed.

Retesting ANC clients with negative HIV test results: Retesting HIV-negative women during ANC is more systematically practiced in Uganda than Kenya; however, retesting eligible women on admission for L&D, while more common for Ugandan than Kenyan clients, was not systematically practiced for either country. This means that there would be small percentages of post-partum women who may have converted to HIV-positive status and consequently, exposed infants, who were not detected. A rough estimate of the impact of no follow-up testing, based on a rate of infection for infants from untreated infection mothers of 15-45%²⁷ (average 30%), and the assumption of (using Uganda estimates) an annual HIV incidence of 0.5% for negatives, an estimated 25% of infected babies will come from women who were negative at initial ANC visits and then converted to positive. Considering this estimated impact, closing the gap in HIV retesting should be a priority action towards eliminating mother-to-child transmission of HIV (eMTCT).

Partner testing: Assessment of the HIV status for the partner of the ANC client was not consistent for either country, with the high levels (almost half for both countries) of partners who were assessed, being the partners of women who were documented as HIV-positive during ANC. It appears that providers focus on testing partners of HIV-positive women or that the incentive for accepting the test is higher among men with a positive partner. This practice would reduce assessments of the woman's risk for HIV infection from her partner and provision of PrEP. Considering lower overall testing rates among the adult male population, reported by nationally representative surveys in both countries, enhanced partner testing could help to close the gender gap in HIV testing (Kenya DHS, 2014; Uganda DHS, 2016).

Testing children during outpatient visits: Medical record review and direct observation showed no evidence that sick children, including young infants in the PEPFAR priority districts/counties, are routinely

²⁷ <https://www.avert.org/professionals/hiv-programming/prevention/prevention-mother-child>. (Based on WHO estimate November 2018).

screened for exposure to or possible HIV infection during outpatient visits, although this practice was more commonly observed during the outpatient visits of sick children in Kenya. Even when the mother's status is reported HIV-negative, there should be a record that documents her test was sufficiently recent to assume the status remains the same. The low levels of retesting ANC clients who were initially negative, particularly in Kenya, indicates a critical need to screen HIV status among sick children and young infants and their mothers at the outpatient visit.

While data on HIV prevalence among children presenting to health care facilities in sub-Saharan Africa are scant in general and were not accessible in Uganda and Kenya, the WHO recommendations²⁸ suggest assessing HIV status of all under five children and their mothers and conduct testing if the HIV status is not known. Furthermore, literature also suggests HIV testing for all children at possible entry points to medical care, irrespective of symptoms, in order to reduce HIV-associated mortality through timely diagnosis (first 90% target) and initiation of ART.²⁹ PEPFAR data from selected study facilities showed very low levels of infants who received the first test during the first 12 months of life and tested positive. This may indicate a treatment success; however, this may also indicate limited diagnosis and follow-up. According to UPHIA, 2016-2017 (Uganda MOH 2019), when adjusting parent reports with ARVs detected in blood, only 56.3% of children diagnosed with HIV in Uganda has been previously diagnosed and more than half of HIV-positive children (54.3%) were not on ART. Similarly, the 90-90-90 cascade is the weakest among children, both in Uganda and Kenya (Uganda MOH 2019, Kenya MOH 2020). The results suggest the need for rapid expansion of checking HIV status of sick babies and their mother, presenting at outpatient clinics, HIV testing for babies at risk, and careful follow-up of HIV-exposed infants to achieve and sustain national goals.

Preventive ARV and ART for PMTCT: Documentation of the ARV regimen for Kenyan ANC clients whose records were reviewed was unclear. A review of the ANC register showed that there are columns only for AZT, NVP, and HAART, with the provider required to specify the HAART regimen (but space only available for a code). There continue to be HIV-positive pregnant women who have no evidence of ARV during pregnancy (1% Uganda and 6% Kenya) and larger percentages of women admitted for L&D without evidence of ARV during pregnancy or at delivery (16% Uganda and 33% Kenya). It is possible that some of the L&D women without documentation of ARV prior to admission for L&D had not received ANC.

While the practice of providing the preventive infant ARV during labor and delivery seemed universal, there were gaps in documentation.

PrEP: There was no evidence that PrEP is routinely provided in the subset of facilities where information was collected. PrEP was not observed or documented as a topic of discussion with any of the sample ANC and delivery clients from any facility.

Delivery practices for PMTCT: Knowledge among providers of L&D services was high for specific PMTCT practices and general safe delivery practices relevant for PMTCT (e.g., no routine episiotomy, minimize vacuum or forceps, minimize vaginal examinations, active management of the third stage of labor). A substantial proportion of providers, however, also identified practices that are not recommended for delivery regardless of HIV status (e.g., hibitane vaginal cleaning), indicating that when providing education about safe delivery practices, practices to be discouraged should also be addressed. Eliminating these non-recommended (harmful or useless) practices also reduces the workload for the service provider, allowing more time for essential activities.

²⁸ https://apps.who.int/iris/bitstream/handle/10665/104772/9789241506823_Chartbook_eng.pdf?sequence=16
Integrated Management of Childhood Illnesses, WHO, 2014.

²⁹ <https://journals.sagepub.com/doi/10.1177/0956462413518762>

FP and safe sex: Counseling HIV-positive ANC clients on FP or on use of condoms (dual method or for safe sex) were identified as priorities by few ANC service providers from either country, although, record reviews did document counseling using the condom for dual protection for more than three quarters of ANC clients in both countries. Among L&D service providers completing a questionnaire, 71% (Uganda) and 50% (Kenya) reported they provide FP services, yet on discharge, only around half of the Ugandan clients and none of the Kenyan clients had a method of choice recorded. Almost all of the Ugandan women were recorded as having chosen condom plus LAM for FP/dual protection. The lack of attention to FP in Kenya, and the fact that none of the Ugandan women were documented choosing a more effective method than condom/LAM provides evidence of the need to strengthen the implementation and effectiveness of FP services for HIV-positive women prior to discharge after delivery.

Systems to support patient follow-up: Information sharing is essential but insufficient for adherence to PMTCT and ART regimens. HIV services may cross services, requiring referrals of patients to other locations within the facility or to other facilities. These referrals may not be followed by the patient for multiple reasons, including lack of belief it is needed, logistical problems accessing the services, and reluctance to begin a new relationship with providers/facilities for HIV, a disease where stigma still exists. Generic systems to support the HIV-positive woman and her exposed infant receiving follow-up services for PMTCT were reported, however, processes for monitoring whether clients follow through and actually receive the follow-up and/or referral services were not commonly reported. Patient follow-up is also important where blood is sent offsite for testing (e.g., for viral load or infant HIV test) and results are returned at a later date. Without a system for contacting the patient, needed care might be delayed until the patient returns, or the patient might not return, and thus an opportunity for treatment would be lost. SIMS data also confirmed the need for improvements in infant follow-up practices in three out of five facilities in Kenya, where data was available.

Clinical follow-up for patients on PrEP and life-long ART: Measuring viral load (or CD4) was consistently reported, but these tests are commonly performed by sending blood to other facilities. Thus, routine systems are needed to contact patients after the visit when the blood was drawn, if the results return and indicate a need for changes. These were reported for two of six facilities in Kenya where more in-depth information on HIV services was collected.

Adolescent knowledge about HIV and prevention: Interviewed adolescents from both countries were familiar with HIV, and knowledge for where they could get an HIV test was high. Respondents' knowledge of how HIV was transmitted was faulty, however, and they did not report being counseled about HIV testing. Knowledge of condoms was low in Ugandan respondents. Among adolescents who reported they knew about condoms, most were aware that condom use reduces risk from HIV, but knowledge for where they could get condoms was low among Kenyan respondents. Nationally representative surveys in Uganda and Kenya have also shown limited HIV testing, knowledge of their status, and comprehensive knowledge on HIV among these target populations (Uganda MOH 2019, Kenya MOH 2020). The results suggest an urgent need for enhanced efforts to improve testing, counseling, and treatment follow-up for younger generations in both countries to achieve and sustain HIV-related national and global goals.

V. CONCLUSIONS AND RECOMMENDATIONS

A. Conclusions

The developed tools are appropriate, feasible to implement, and provide more in-depth assessment of the quality of care for RMNCAH, according to the existing global guidance (e.g., WHO's quality of care framework for maternal, newborn, and child health) than other tools commonly used for assessing facility-based RMNCAH services. These tools specifically:

- Allow more in-depth assessment of integrated RMNCAH and HIV care, including availability of various ART regimens, PrEP, and other priority services.

- Place much larger emphasis on patient-centered practices and experience of care, based on WHO's quality of care framework. Specifically, based on recently published WHO QoC standards of Maternal and Newborn Care, the tools explore continuity of care, referral, effective communication, respect and preservation of dignity, and emotional support (WHO 2016). These components were not covered in depth by any other global facility assessment tools, including SARA and SPA.
- Care of sick children is specifically tailored to assess two different age groups, young infants below two months and children above two months of age. The tools focus on outpatient management of severe possible bacterial infection among young infants based on the updated WHO recommendations, the area that has not previously been explored in depth.
- Provider questionnaires cover knowledge assessment for all priority content areas (ANC, maternal, newborn, and child health) as well as the observation of a simulated clinical scenario using an anatomical model for newborn resuscitation. These areas are not covered by SPA or SARA but are critically important to understand the root cause of the quality gap.
- Assess the use of unnecessary, harmful practices, including non-evidence-based use of antibiotics across the MNCH continuum, an area that has been identified as deficient in many low- and middle-income countries but is not covered by SPA or SARA.
- Place a larger emphasize on individual and institutional QI capacity and functionality of a continuous QI process within the facility, including routine measurement of quality for improvement and data-driven decision-making.
- Supplement costly observations on processes of care with assessment of medical documentation (neither SARA nor SPA have similar modules). This is particularly helpful to assess quality of care of infrequent events (e.g., complications) within limited resources and help countries to identify gaps in availability of medical information essential to assess quality of MNCH care.

The modular approach of the tools allows conducting a focused assessment in priority clinical areas of interest (e.g., ANC), as needed with fewer resources. By using information from a variety of sources, the tools allow for triangulation of results and thus provide a deeper understanding of quality of care gaps and their root causes. The tools were found to be adequate for achieving the objective, and with minor revisions to adapt them to specific country context, they will provide an important contribution to the ability to quantify the quality of integrated HIV services with RMNCAH services.

The assessment of integrated RMNCAH and HIV care in Uganda and Kenya demonstrated that core PMTCT functions were quite strong in both countries, but weaknesses exist in documentation of HIV test results and the ART regimen. A substantial gap in the re-testing of pregnant women undermines the success of EMTCT efforts. Integration of HIV services into MNCH programs other than PMTCT was found to be very poor. This includes limited testing of men at ANC points; limited testing of sick young infants and children under five years old at primary care settings; poor counseling and offering FP services for HIV-positive women; and poor adolescent counseling on preventive practices. Integration between PMTCT and ongoing HIV care also seemed poor in both countries. Systemic processes for monitoring and ensuring follow-through for a woman and her infant from HIV-positive diagnosis to maternal enrollment in life-long ART and follow-up of the exposed infant were not identified.

B. Recommendations

Recommendations for the tools:

1. Link datasets within a given facility and link provider responses and observations for the same provider to enable more in-depth analysis, if needed

2. Assigned data collectors should check completeness of the provider self-administered questionnaires and make sure the provider completes all questions before returning the questionnaire to the data collection team.

General recommendations:

1. Facility-based medical documentation should maintain individual patient records that document the date an HIV test was performed, preferably the testing method used, and the results, to provide the information for supervisors and program monitors to assess the quality and appropriateness of HIV testing (including retesting) services. This is particularly important for PMTCT services.
2. A standardized location in the patient chart along with standardized codes for the ART regimen a woman and exposed infant are receiving should be implemented, regularly reviewed, and improved to ensure correct monitoring of PMTCT services. This should also include orientation/training of care providers on a uniform system for recording HIV status and the ARV regimen for HIV-positive women at different times during pregnancy through the postpartum period to improve accurate monitoring of pregnant women and reduce the risk of missing women whose HIV status is not current.
3. Correct and consistent documentation should be improved for all PMTCT services. Patient records with preprinted sections where the services that should be provided and the information about service provision/results is recorded may improve availability and correct documentation of PMTCT practices and result in improved use of data for clinical decisions. Where preprinted records/checklists are not feasible, it may be beneficial to make posters similar to checklists to remind providers (and clients) of the various signs and symptoms that may indicate risk of HIV infection and of the various services relevant to PMTCT that should be provided.
4. Training on evidence-based practices should include information on prior practices no longer recommended or discouraged practices, to help providers identify these changes in practices that also need to be incorporated into patient care.
5. Methods such as QI coaching and clinical mentoring in combination with provider decision support tools (e.g., posters, checklists in various service sites to increase awareness of signs/symptoms for HIV infection, and to promote patients asking for/providers offering HIV testing for persons at risk for HIV infection) should be considered to reinforce correct and consistent use of evidence-based clinical recommendations. The results of these efforts should be regularly monitored in health facilities and used for continuous improvement, learning, and adaptation.
6. Monitoring systems around integrated PMTCT and RMNCAH services on one hand and PMTCT and ongoing HIV care on the other, should be strengthened and include measures around identified weaknesses (testing for men, retesting of pregnant women, testing of sick children under five years old, monitoring viral load, PrEP, and knowledge of HIV status and risky behaviors).

Clinical content-specific recommendations:

1. Strengthen the system for identifying eligible HIV-negative women and retesting them to ensure that the current HIV status and appropriate measures are taken for PMTCT throughout the pregnancy, childbirth, and breastfeeding periods. For example, requiring an explicit note in the ANC patient record where a negative HIV test result and the date a second HIV test is due can be recorded may improve compliance with HIV retesting practices among pregnant women.

2. Explicit recommendations for HIV screening and testing for sick infants and older children and partners of pregnant women, regardless of the maternal HIV status, are needed in both countries to improve early identification, treatment, and consequently, survival.
3. There is a clear need to strengthen the implementation and effectiveness of FP services for HIV-positive women prior to discharge and documentation of methods selected or the woman's final decision (e.g., method of choice or why a method was not selected).
4. Protocols for ensuring that HIV education, as an integral part of adolescent health services, should be implemented and reinforced.
5. PrEP services need to be strengthened for Kenya and reviewed in Uganda. Explicit guidelines for who should be advised to take PrEP, counseling on the required patient follow-up when on PrEP, and required documentation of PrEP counseling should be reinforced.
6. Systems for tracking whether referred women and their exposed infants access the services they are referred for needs to be strengthened. Monitoring the referral compliance rates would focus more attention on this aspect of services and ensure documentation of the result.

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APPENDIX

Details on samples

Annex Table 1: Distribution of provider respondents by facility

| UGANDA (n=71) | | | Kenya (n=102) | | |
|---------------|----------------------|---------------------------|---------------|----------------------|---------------------------|
| Facility | Facility level | Proportion of respondents | Facility | Facility level | Proportion of respondents |
| 1 | Referral Hospital | 20% | 1 | General Hospital | 14% |
| 2 | Health center/clinic | 8% | 2 | Referral Hospital | 26% |
| 3 | Health center/clinic | 11% | 3 | General Hospital | 10% |
| 4 | Health center/clinic | 8% | 4 | General Hospital | 4% |
| 5 | Health center/clinic | 7% | 5 | Referral Hospital | 13% |
| 6 | General Hospital | 17% | 6 | General Hospital | 21% |
| 7 | Health center/clinic | 0% | 7 | Health center/clinic | 7% |
| 8 | Health center/clinic | 3% | 8 | General Hospital | 2% |
| 9 | Health center/clinic | 15% | 9 | General Hospital | 0% |
| 10 | Health center/clinic | 10% | 10 | Health center/clinic | 0% |
| | | | 11 | Health center/clinic | 3% |

Annex Table 2: Characteristics of interviewed service providers

| | Uganda (n=71) | Kenya (104) |
|---|---------------|-------------|
| Qualification³⁰ | | |
| Physician or medical clinical officer ³¹ | 14% (10) | 33% (34) |
| Professional nurses (RNs) or midwives ³² | 41% (29) | 43% (43) |
| Enrolled nurse or midwife ³³ | 39% (27) | 11% (11) |
| Public health nurse | 1% (1) | 0 |
| Other ³⁴ | 1% (1) | 12% (12) |
| Years of experience | | |
| Average years since completion of clinical training ³⁵ | 10.5 | 10.9 |
| Average years working at this facility ³⁶ | 6.9 | 6.8 |
| Average hours per week working in a facility | 40.6 | 43 |
| Services personally provided | | |
| Antenatal care (ANC) | 54% (38) | 55% (57) |
| Normal labor and delivery | 54% (38) | 39% (41) |
| Labor complications | 46% (33) | 36% (37) |
| Routine newborn care | 61% (43) | 45% (47) |
| Sick child care (including young infants) | 37% (26) | 39% (41) |
| Emergency/inpatient care of sick children | 37% (26) | 39% (41) |
| Well child care | 48% (34) | 37% (38) |
| Adolescent medical services | 52% (37) | 36% (37) |
| Family planning (FP) | 59% (42) | 44% (46) |
| Questionnaire module completed | | |
| General information (all respondents) | 71 (100%) | 104 (100%) |
| Antenatal care | 21 (30%) | 30 (29%) |
| Delivery care | 31(44%) | 20 (19%) |
| Newborn care | 30 (43%) | 22 (21%) |
| Child Health | 19 (27%) | 11 (11%) |
| Adolescent health | 30 (42%) | 22 (21%) |

³⁰ Information missing for 1 respondent Uganda and 4 Kenya

³¹ Medical staff include obstetricians/gynecologists (1), doctors, medical officers (MO), and medical clinical officers (CO), with most having medical clinical officer qualifications as well as MO and CO interns.

³² Registered nurses (RN) graduate from specified nursing program and pass nationally specified qualification tests to become registered.

³³ Enrolled nurses (EN) have formal courses as well, but these are shorter and less comprehensive than those of RNs. ENs may or may not be licensed depending on country standards. They usually work under RNs and are similar to practical nurses.

³⁴ The other qualifications included counselors (4%) and peer educators (5%)

³⁵ Information missing for 3 respondent Uganda and 7 Kenya

³⁶ Information missing for 1 respondent Uganda and 18 Kenya

Annex Table 3: Characteristics of interviewed clients

| | UGANDA(n=335 ¹) | KENYA (n=209) |
|---|-----------------------------|---------------|
| Average age | 24.1 | 25.1 |
| Married/cohabitation | 95% | 90% |
| Unmarried | 5% | 10% |
| Highest formal education | | |
| None/some primary | 47% | 32% |
| Completed primary/some secondary | 39% | 42% |
| Completed secondary or higher | 13% | 26% |
| Main occupation | | |
| Student | 3% | 6% |
| Housewife | 62% | 55% |
| Farming | 19% | 2% |
| Service/business | 8% | 35% |
| Currently living with | | |
| Husband | 88% | 78% |
| Parents | 9% | 14% |
| Alone | 1% | 3% |
| Self-described economic status | | |
| Poor | 23% | 5% |
| Low-middle | 57% | 16% |
| Middle | 17% | 71% |
| Upper middle/upper | 2% | 8% |
| Self-described health status | | |
| Good | 88% | 90% |
| Medium | 6% | 7% |
| Bad/very bad | 6% | 3% |
| Reason for visit | | |
| Scheduled visit for woman | 44% | 49% |
| Scheduled visit for child | 9% | 22% |
| Personal medical issue | 16% | 5% |
| Sick child | 7% | 3% |
| Delivery | 22% | 11% |
| Reproductive status | | |
| Ever was pregnant | 81% | 99% |
| Currently pregnant | 56% | 52% |
| ¹ The general information was missing for 25 Ugandan respondents | | |
| ² The general information was missing for 57 Kenyan respondents | | |

Annex Table 4: Distribution of client respondents by facility

| UGANDAN CLIENT RESPONDENTS | | | | | KENYA CLIENT RESPONDENTS | | | | |
|----------------------------|----------------------------|-------------|--------------|--------------|--------------------------|----------------------------|-------------------|--------------|-------------|
| Facility | General information | Adolescent | ANC | MNH L&D | Facility | General information | Adolescent (n=13) | ANC (n=161) | MNH (n=80) |
| 1 | 13% | 16% | 12% | 14% | 1 | 6% | 15% | 6% | 9% |
| 2 | 12% | 16% | 11% | 14% | 2 | 14% | 23% | 18% | 39% |
| 3 | 12% | 4% | 14% | 15% | 3 | 11% | 31% | 14% | 12% |
| 4 | 13% | 13% | 11% | 11% | 4 | 5% | 8% | 6% | 1% |
| 5 | 8% | 9% | 11% | 5% | 5 | 7% | 15% | 4% | 10% |
| 6 | 22% | 25% | 22% | 8% | 6 | 6% | 0% | 7% | 15% |
| 7 | 7% | 9% | 7% | 7% | 7 | 6% | 0% | 0% | 0% |
| 8 | 0% | 0% | 0% | 0% | 8 | 17% | 0% | 20% | 11% |
| 9 | 4% | 0% | 2% | 9% | 9 | 14% | 0% | 10% | 6% |
| 10 | 8% | 0% | 11% | 6% | 10 | 9% | 0% | 9% | 2% |
| | | | | | 11 | 10% | 8% | 4% | 2% |
| Total | 100% (n=335 ¹) | 100% (n=93) | 100% (n=160) | 100% (n=105) | | 100% (n=209 ²) | 100% (n=13) | 100% (n=161) | 100% (n=80) |

¹ The general information was missing for 25 Ugandan respondents
² The general information was missing for 57 Kenyan respondents

Annex Table 5: Distribution of observations by service being received and facility

| Facility | | | | |
|----------|--------------|-------------|---------------------------|----------------------------------|
| Uganda | ANC | L&D | Sick infant 0-59 days old | Sick child 60 days-59 months old |
| 1 | 11% | 29% | 18% | 10% |
| 2 | 11% | 8% | 0% | 10% |
| 3 | 11% | 14% | 5% | 10% |
| 4 | 11% | 7% | 32% | 10% |
| 5 | 9% | 7% | 0% | 4% |
| 6 | 9% | 15% | 18% | 12% |
| 7 | 11% | 5% | 0% | 10% |
| 8 | 9% | 8% | 0% | 11% |
| 9 | 7% | 3% | 18% | 10% |
| 10 | 11% | 3% | 9% | 10% |
| Total | 100% (n=137) | 100% (n=59) | 100% (n=22) | 100% (n=145) |
| Kenya | | | | |
| 1 | 6% | 0% | 1% | 6% |
| 2 | 13% | 76% | 24% | 14% |
| 3 | 10% | 24% | 26% | 11% |
| 4 | 6% | 0% | 22% | 9% |
| 5 | 17% | 0% | 25% | 1% |
| 6 | 15% | 0% | 25% | 19% |
| 7 | 15% | 0% | 0% | 8% |
| 8 | 11% | 0% | 12% | 12% |
| 9 | 0% | 0% | 4% | 7% |
| 10 | 5% | 0% | 4% | 5% |
| 11 | 1% | 0% | 1% | 8% |
| Total | 144 | 21 | 68 | 168 |

Annex Table 6: Sample numbers for retrospective record reviews

| Sample category | Uganda | Kenya |
|---|-------------|-------------|
| ANC record reviews (primarily information documented in registers) | 357 | 462 |
| Among ANC records, those with specific conditions | | |
| Most recent ANC clients (aim was 15) | 42% (n=151) | 50% (n=230) |
| HIV positive | 45% (n=161) | 36% (n=165) |
| Labor/delivery/postpartum (maternal and newborn essential care) | 247 | 262 |
| Among L&D records for a general sample, those with specific conditions: | | |
| General sample | 37% (n=91) | 61% (n=159) |
| HIV+ mother | 52% (n=129) | 42% (n=110) |
| Maternal complication (no HIV positive patients assessed) | 354 | 207 |
| Newborn complications | 240 | 183 |
| Sick children | 737 | 786 |

Annex Table 7: Antenatal care record review sample by criteria for selection

| Facility | General Sample (most recent 15 ANC clients) | HIV positive sample | Hypertensive sample | Total ¹ |
|---|---|---------------------|---------------------|--------------------|
| Uganda | | | | |
| 1 | 10% (n=15) | 9% (n=14) | 30% (n=15) | 13% (n=45) |
| 2 | 10% (n=15) | 13% (n=21) | 0% (n=0) | 8% (n=30) |
| 3 | 10% (n=15) | 10% (n=16) | 22% (n=13) | 12% (n=44) |
| 4 | 10% (n=15) | 10% (n=16) | 17% (n=10) | 11% (n=40) |
| 5 | 10% (n=15) | 9% (n=15) | 0% (n=0) | 8% (n=28) |
| 6 | 10% (n=15) | 9% (n=15) | 12% (n=7) | 10% (n=37) |
| 7 | 10% (n=15) | 9% (n=15) | 0% (n=0) | 8% (n=30) |
| 8 | 10% (n=15) | 9% (n=15) | 21% (n=12) | 12% (n=42) |
| 9 | 9% (n=14) | 9% (n=15) | 2% (n=1) | 8% (n=30) |
| 10 | 11% (n=16) | 9% (n=14) | 0% (n=0) | 8% (n=30) |
| Total sample for service | 100% (n=150) | 100% (n=160) | 100% (n=58) | 100% (n=356) |
| Percent of total sample | 42% | 45% | 17% | 100% |
| Kenya | | | | |
| 1 | 7% (n=15) | 6% (n=10) | 1% (n=1) | 6% (n=26) |
| 2 | 8% (n=17) | 9% (n=15) | 31% (n=23) | 11% (n=53) |
| 3 | 6% (n=14) | 9% (n=15) | 14% (n=10) | 9% (n=40) |
| 4 | 7% (n=15) | 10% (n=17) | 19% (n=14) | 10% (n=46) |
| 5 | 18% (n=40) | 13% (n=22) | 8% (n=6) | 15% (n=67) |
| 6 | 20% (n=45) | 10% (n=17) | 9% (n=7) | 15% (n=68) |
| 7 | 11% (n=25) | 11% (n=18) | 4% (n=3) | (n=45) |
| 8 | 13% (n=29) | 18% (n=29) | 9% (n=7) | 10% (n=64) |
| 9 | 0% (n=0) | 0% (n=0) | 1% (n=1) | 0% (n=1) |
| 10 | 12% (n=27) | 12% (n=20) | 3% (n=2) | (n=47) |
| 11 | 0% (n=0) | 0% (n=0) | 0% (n=0) | 0% (n=0) |
| Total sample for service | 100% (n=226) | 100% (n=163) | 100% (n=74) | 100% (n=462) |
| Percent of total sample | 48% | 35% | 15% | 100% |
| ¹ Numbers of individual clients are less than the sum across the three eligibility criteria because some client were in both the general sample and also were either HIV positive or had hypertension. | | | | |

Annex Table 8: Labor and delivery record review sample by criteria for selection

| Facility | General sample | HIV positive sample | Newborn asphyxia sample | Low birthweight sample | Premature infant sample | Total records |
|---------------------------------|---------------------|---------------------|-------------------------|------------------------|-------------------------|---------------------|
| Uganda | | | | | | |
| 1 | 26% (n=24) | 12% (n=16) | 0% (n=0) | 0% (n=0) | 6% (n=3) | 12% (n=29) |
| 2 | 11% (n=10) | 12% (n=15) | 0% (n=0) | 17% (n=10) | 8% (n=4) | 13% (n=32) |
| 3 | 19% (n=17) | 6% (n=8) | 0% (n=0) | 0% (n=0) | 0% (n=0) | 10% (n=24) |
| 4 | 15% (n=14) | 12% (n=15) | 18% (n=3) | 2% (n=1) | 0% (n=0) | 12% (n=29) |
| 5 | 14% (n=13) | 11% (n=14) | 0% (n=0) | 5% (n=3) | 4% (n=2) | 7% (n=17) |
| 6 | 2% (n=2) | 8% (n=10) | 6% (n=1) | 3% (n=2) | 15% (n=8) | 7% (n=18) |
| 7 | 4% (n=4) | 12% (n=15) | 35% (n=6) | 23% (n=14) | 21% (n=11) | 12% (n=29) |
| 8 | 1% (n=1) | 13% (n=17) | 24% (n=4) | 7% (n=4) | 13% (n=7) | 9% (n=22) |
| 9 | 6% (n=5) | 11% (n=14) | 12% (n=2) | 22% (n=13) | 23% (n=12) | 13% (n=31) |
| 10 | 1% (n=1) | 4% (n=5) | 6% (n=1) | 22% (n=13) | 11% (n=6) | 7% (n=16) |
| Total sample for service | 100% (n=91) | 100% (n=129) | 100% (n=17) | 100% (n=60) | 100% (n=53) | 100% (n=247) |
| Percent of total sample | 37% | 52% | 7% | 24% | 21% | 100% |
| Kenya | | | | | | |
| 1 | 8% (n=12) | 12% (n=13) | 0% (n=0) | 0% (n=0) | 0% (n=0) | 10% (n=25) |
| 2 | 8% (n=13) | 15% (n=16) | 0% (n=0) | 0% (n=0) | 6% (n=1) | 9% (n=23) |
| 3 | 9% (n=15) | 16% (n=17) | 0% (n=0) | 0% (n=0) | 6% (n=1) | 9% (n=23) |
| 4 | 7% (n=11) | 10% (n=11) | 0% (n=0) | 0% (n=0) | 0% (n=0) | 8% (n=21) |
| 5 | 15% (n=23) | 20% (n=22) | 100% (n=1) | 100% (n=3) | 69% (n=11) | 21% (n=55) |
| 6 | 13% (n=20) | 16% (n=17) | 0% (n=0) | 0% (n=0) | 13% (n=2) | 13% (n=34) |
| 7 | 6% (n=10) | 2% (n=2) | 0% (n=0) | 0% (n=0) | 0% (n=0) | 5% (n=13) |
| 8 | 8% (n=12) | 5% (n=5) | 0% (n=0) | 0% (n=0) | 6% (n=1) | 7% (n=18) |
| 9 | 9% (n=14) | 0% (n=0) | 0% (n=0) | 0% (n=0) | 0% (n=0) | 5% (n=14) |
| 10 | 8% (n=13) | 6% (n=7) | 0% (n=0) | 0% (n=0) | 0% (n=0) | 7% (n=19) |
| 11 | 10% (n=16) | 0% (n=0) | 0% (n=0) | 0% (n=0) | 0% (n=0) | 7% (n=17) |
| Total sample for service | 100% (n=159) | 100% (n=110) | 100% (n=1) | 100% (n=3) | 100% (n=16) | 100% (n=262) |
| Percent of total sample | 61% | 42% | 0% | 1% | 6% | 100% |

Antenatal care services

Annex Table 9: ANC service provider reported information related to HIV services

| | | Uganda (n=21) | Kenya (n=30) |
|----------|---|------------------|-----------------|
| A | Job support/services provided | | |
| | Training in past 12 months in: Screening for HIV infection and prevention of Mother to Child Transmission (PMTCT) | 48% | 43% |
| | Use guidelines/job aids for PMTCT services | 81% | 87% |
| | Services provided: Screening for HIV infection | 100% | 83% |
| | Task shifting: HIV testing service provided by other (general) cadre staff | 57% | 47% |
| | Provide HIV testing during outreach visits | 86% | 77% |
| B | Additional questions on pre-exposure prophylaxis (PrEP) specific to Kenya | | (n=17) |
| | Training in past 12 months: PrEP | | 18% |
| | Services provided: Treatment of HIV infection | | 76% |
| | Services provided: PrEP | | 65% |
| | Asked if they have system in place to ensure PrEP | | 53% |
| C | Routine services provided and systems used for HIV positive women | (n=21) | (n=30) |
| | Conduct CD4 count | 57% | 53% |
| | Conduct Viral load | 48% | 23% |
| | Conduct clinical staging of HIV infection | 62% | 70% |
| | Evaluate for ART | 57% | 50% |
| | Counsel on Prevention of Mother to Child transmission (PMTCT) | 95% | 97% |
| | Start ARV treatment | 95% | 90% |
| | Refer to the HIV clinic | 62% | 40% |
| | Write free form referral note with all clinical information that I consider important for a patient to take to HIV clinic | 29% | 20% |
| | Write standard referral note with all information required by protocol for a patient to take to HIV clinic | 62% | 57% |
| | Support staff verifies whether woman got admitted in HIV clinic | 0% | 3% |
| | Patient brings standard record from HIV clinic with all necessary information | 14% | 10% |
| | Patient brings free-form record from HIV clinic with all necessary information | 0% | 0% |
| | Do you have system to notify maternity on HIV+ status of pregnant to ensure PMTCT | 80% | 87% |
| D | Non-prompted response to question about the most important issues about which to counsel every pregnant woman | (n=21) | (n=30) |
| | HIV testing and PMTCT | 57% | 20% |
| | Family planning | 14% | 37% |
| | Safer sex | 0% | 10% |
| | Early and exclusive breastfeeding | 5% | 27% |
| D | Reported system used for linking ANC with maternity services for PMTCT | Not asked | (n=26) |
| | Write maternal HIV status information in ANC/mother-child booklet | | 85% |
| | In addition to documenting in ANC linkage system with mentor mothers | | 12% |
| | In addition to documenting in ANC linkage system with maternity | | 8% |
| | PMTCT maternity referral form | | 4% |

Annex Table 10: Information on interviewed and observed ANC clients

| | | Uganda | Kenya |
|----------|---|-------------|---|
| A | Interviewed ANC clients | (n=160) | (n=161) |
| | Clients reporting they received an HIV test during this pregnancy | 97%(n=155) | 100% (n=161) |
| B | Observed ANC clients | (n=137) | (n=144) |
| | Health worker ask about or the client mention her HIV status | 87% (n=119) | 58% (n=84) |
| | Health worker perform, inquire about, or refer for an HIV test | 80% (n=110) | 53% (n=76) |
| | Client is HIV positive (either prior to this visit or diagnosed this visit) | 12% (n=16) | 10% (n=14) |
| C | Observed ANC clients who were diagnosed HIV positive during the observed visit | (n=17) | (n=15) |
| | Health worker ask for HIV status of the partner | Not asked | 6% (n=1) |
| | Partner is HIV positive | Not asked | 0% (The 1 client partner whose status was checked was not positive) |
| | Provider mention /prescribe PrP to pregnant woman | Not asked | Not applicable |
| | When to take NVP and AZT for HIV exposed infant | Not asked | 0% |
| | Adherence counseling and importance of engagement in care | Not asked | 0% |
| | Importance of partner involvement in HIV testing and/or treatment | Not asked | 0% |

Annex Table 11: Record review results for ANC clients

| | | Uganda | Kenya |
|----------|--|-------------|-------------|
| A | HIV Stage assessed | (n=160) | (n=163) |
| | Stage 1 | 55% (n=88) | 37% (n=60) |
| | Stage 2 | 5% (n=8) | 18% (n=30) |
| | Stage 3 | 2% (n=3) | 8% (n=13) |
| | Stage 4 | 0% (n=0) | 1% (n=1) |
| | No stage documented | 38% (n=61) | 36% (n=59) |
| B | Other tests | | |
| | CD4 measured any time | 3% (n=4) | 28% (n=46) |
| | CD4 < 350 | 2% (n=3) | 6% (n=10) |
| | CD4 measured most recent visit | 2% (n=3) | 10% (n=2) |
| | Viral load measured any time | 0% (n=0) | 36% (n=59) |
| | Viral load measured most recent visit | 0% (n=0) | 7% (n=11) |
| | Client has severe/advanced HIV (CD4 count <350 cells/mm ³ , or WHO clinical stage 3 or 4) | 3% (n=4) | 14% (n=16) |
| C | Additional information | | |
| | Client counseled on using condom for dual protection against pregnancy and HIV infection | 80% (n=130) | 77% (n=126) |
| | Adherence counseling was provided | Not asked | 31% (n=50) |

Labor and delivery

Annex Table 12: Provider of L&D: Reported information related to HIV services

| | | Uganda (n=31) | Kenya (n=20) |
|---|--|------------------|-----------------|
| A | Training and services offered | | |
| | Received any training past 2 years in special delivery care practices for preventing mother-to-child transmission PMTCT of HIV | 16% | 25% |
| | Offer family planning services for HIV positive women | 71% | 50% |
| B | L&D Providers: Reported actions during L&D for PMTCT | | |
| | PMTCT counseling | 77% | 75% |
| | Provide ARV prophylaxis to woman in early labor | 58% | 70% |
| | Wipe nose, mouth, eyes of newborn with gauze, suction only if necessary | 52% | 45% |
| | No routine episiotomy | 61% | 70% |
| | Minimize instrument delivery | 58% | 65% |
| | Hibitane vaginal cleansing | 32% | 40% |
| | Minimize vaginal exam | 55% | 75% |
| | Minimize artificial rupture of membranes | 71% | 85% |
| | Avoid milking cord/ immediate clamp cord | 68% | 75% |
| | Appropriate use of partograph | 48% | 65% |
| | Active mgt of 3rd stage labor | 39% | 75% |
| | Provide ARV prophylaxis to infant | 74% | 90% |
| | PMTCT counseling, ARV for Mother and child checked | 39% | 0% |
| C | Knowledge of actions during labor and delivery to prevent/ reduce mother-to-child transmission of HIV | | |
| | CORRECT: PMTCT counseling | 77% | 75% |
| | CORRECT: Provide ARV prophylaxis to woman in early labor | 58% | 70% |
| | CORRECT: Provide ARV prophylaxis to infant | 74% | 95% |
| | CORRECT (NOT EXCLUSIVE TO PMTCT): Wipe nose, mouth, eyes of newborn with gauze, suction only if necessary | 52% | 45% |
| | CORRECT (NOT EXCLUSIVE TO PMTCT): No routine episiotomy | 61% | 70% |
| | CORRECT (NOT EXCLUSIVE TO PMTCT): Minimize instrument delivery | 58% | 65% |
| | Incorrect: Hibitane vaginal cleansing | 32% | 40% |
| | CORRECT (NOT EXCLUSIVE TO PMTCT): Minimize vaginal exam | 55% | 75% |
| | CORRECT (NOT EXCLUSIVE TO PMTCT): Minimize artificial rupture of membranes | 71% | 85% |
| | CORRECT (NOT EXCLUSIVE TO PMTCT): Avoid milking cord/ immediate clamp cord | 68% | 75% |
| | CORRECT (NOT EXCLUSIVE TO PMTCT): Appropriate use of partograph | 48% | 65% |
| | CORRECT (NOT EXCLUSIVE TO PMTCT): Active management of 3rd stage labor | 39% | 75% |
| | All correct items and no incorrect items identified | 39% | 0% |
| B | Systems for patient follow up reported by providers of L&D services | (n=31) | (n=20) |

| | | | |
|---|--|--------|--------|
| | Described follow-up system for HIV (+) mothers after discharge | 58% | 55% |
| | Described system to ensure integration of HIV (+) mothers in HIV care | 39% | 45% |
| C | Systems for patient follow up reported by providers of newborn care | (n=30) | (n=22) |
| | Any system for exposed infant follow-up | 80% | 64% |
| | System to ensure integration of babies born from HIV (+) mothers in HIV care if needed | 67% | 36% |
| | Communication with HIV clinic to check whether babies born from HIV(+) mothers were integrated in HIV care | 53% | 32% |

Annex Table 13: HIV information for observed L&D clients

| | | Uganda | Kenya |
|---|--|--------|--------|
| A | Information from initial assessment for observed women <u>documented in woman's medical record</u> | (n=59) | (n=21) |
| | Woman's HIV status | 69% | 100% |
| B | Admission <u>observations</u> for L&D clients | (n=42) | (n=8) |
| | HIV Status checked | 88% | 88% |
| | Among those with HIV status checked | (n=37) | (n=7) |
| | Woman reported she was HIV positive | 5% | 14% |
| | Offered non-HIV positive women HIV test | 0% | 0% |
| C | Counseling for <u>observed</u> HIV positive women | (n=2) | (n=1) |
| | Provider asked if client was currently taking ARVs (fill only for HIV+) | 100% | 0% |
| | Client is currently taking ARVs | 50% | |
| | Provider asked client when she took last dose of ARVs | 50% | |
| | Provider explained why the mother should take an ARV(s) | 100% | 0% |
| | Provider explained when and how the mother should take ARV(s) | 50% | |
| | Provider administered ARV(s) to mother | 0% | 0% |
| | Provider explained why the newborn should take an ARV(s) | 100% | 0% |
| | Provider explained when and how newborn should take ARV(s) | 100% | 100% |

Annex Table 14: HIV information from interviewed L&D clients (collected for Kenya only)

| | Uganda | Kenya |
|---|---------------|--------|
| | Not collected | (n=37) |
| Client knew only own HIV status prior to admission for delivery | | 38% |
| Client knew only partner's HIV status prior to admission for delivery | | 0% |
| Client knew both own and partner's HIV status prior to admission for delivery | | 51% |
| | | |
| Provider asked about client HIV status only | | 27% |
| Provider asked about partner's HIV status only | | 0% |
| Provider asked about both client and partner's HIV status | | 0% |
| | | |
| Provider only offered HIV test for client | | 8% |
| Provider only offered HIV test for client's partner | | 3% |
| Provider offered HIV test for both client and client's partner | | 3% |
| No HIV test offered | | 86% |

Annex Table 15: Information from L&D record reviews

| | Uganda | Kenya |
|--|------------------|--|
| Feeding status of newborn | (n=132) | (n=108) |
| Exclusively breastfed Newborns | 96% | 77% |
| Exclusive replacement feeding | 0% | 3% |
| Infant feeding status not documented | 4% | 20% |
| Referrals for HIV services | (n=132) | (n=108) |
| Referred to visit HIV services with her baby | 0% | 5% (n=5) |
| Referred for other, unspecified ART services | 0% | 2% (n=2) |
| Counseling recorded | | |
| Counseling on safe sex | 41% | 0% |
| Family planning services | | |
| Counseling on family planning | 63% | 18% |
| Referral for family planning services | 14% | 32% |
| Patient choice of FP method recorded | 51% ¹ | 1% (1 record says yes but no specific method is recorded) |
| Patient recorded as starting method prior to discharge | 46% | 0 |
| | | |

¹ 42% chose LAM plus condom, and 9% chose LAM.

Child health services

Annex Table 16: Services for HIV testing from various data sources

| A | Responses from <u>child health service providers</u> | Uganda (n=19) | Kenya (n=11) |
|---|--|------------------|-----------------|
| | Routinely offer HIV infection screening for children | 95% | 73% |
| | Routinely offer HIV infection screening for mothers | 95% | 45% |
| | Training in past 12 months in screening, treatment, counseling for HIV infection | 26% | 27% |
| | Report using guidelines for screening, treatment, counseling for HIV infection | 58% | 55% |
| | Service provider level of comfort in providing HIV services for children | | |
| | Very comfortable | 32% | 55% |
| | Somewhat comfortable | 47% | 45% |
| | Not comfortable | 16% | 0% |
| | No response provided | 5% | 0% |
| B | Observed service provider practice during <u>observed child health consultation</u> | (n=145) | (n=168) |
| | Asked if mother ever had HIV test | 3% | 40% |
| | Asked if infant ever had HIV test | 1% | 39% |
| | Service provider practice during <u>observed young infant (0-60 days) child health consultation</u> | (n=22) | (n=68) |
| | Asked if mother ever had HIV test | 14% | 54% |
| | Asked if infant ever had HIV test | 0% | 44% |
| C | Record review for sick child | (n=737) | (n=786) |
| | HIV test conducted | 0% (n=2) | 0% (n=3) |

Adolescent health services

Annex Table 17: Adolescent service provider HIV information

| | | Uganda (n=28) | Kenya (n=23) |
|---|--|------------------|-----------------|
| A | Services provided | | |
| | HIV services (general) | | |
| | Provide information | 46% | 57% |
| | Provide counseling | 64% | 74% |
| | Provide clinical management | 57% | 74% |
| | Make referrals | 25% | 43% |
| | HIV Counseling, testing and treatment | | |
| | Provide information | 36% | 65% |
| | Provide counseling | 46% | 78% |
| | Provide clinical management | 57% | 65% |
| | Make referrals | 7% | 52% |
| B | | | |
| | Mention taking steps to help adolescent HIV clients transition to adult services | Not asked | 33% |
| C | Knowledge about emergency contraceptive (EC) | | |
| | Incorrectly believe EC is not safe for a woman living with HIV | 18% | 9% |
| | Incorrectly believe EC cannot be used together with antiretroviral (ARV) medicines | 21% | 0% |

Annex Table 18: Information on interviewed adolescent clients

| | Uganda | Kenya |
|--|--------|--------|
| | (n=93) | (n=13) |
| Average number of facility visits by adolescent respondents | 2.6 | 4.2 |
| Most recent visit accompanied by | | |
| Self | 59% | 46% |
| Parent/guardian | 1% | 38% |
| Sibling | 0% | 0% |
| Spouse | 38% | 8% |
| Friend | 1% | 0% |
| No response | | 8% |
| | (n=37) | (n=6) |
| Among accompanied clients, those who reported they did have time alone with health-care worker | 92% | 83% |
| | (n=93) | (n=13) |
| Services received most recent visit | | |
| ANC | 89% | 54% |
| Sick/treatment/medical | 9% | 46% |
| No response | 2% | |
| Knowledge of other adolescent services | | |
| Was informed about other adolescent services at any time | 13% | 38% |
| Knowledge of services provided for adolescents (prompted responses) | (n=95) | (n=13) |
| STIs | 6% | 15% |
| HIV | 11% | 15% |
| Oral contraceptive pills | 1% | 8% |
| Condoms | 1% | 23% |
| IUD | 3% | 0% |
| Emergency contraceptive pills | 1% | 0% |
| Implants | 0% | 8% |
| Injectables | 2% | 8% |

Annex Table 19: Interviewed adolescent client knowledge/awareness related to HIV and condoms

| | | Uganda | Kenya |
|----------|--|---------------|---------------|
| A | Condoms | (n=95) | (n=14) |
| | Heard about condoms | 24% | 93% |
| | Explanation for why a condom is used | (n=23) | (n=13) |
| | For contraception/ preventing pregnancy | 74% | 77% |
| | For preventing HIV or other sexually transmitted infections | 87% | 77% |
| | Satisfactory Knowledge (both pregnancy and STI prevention is mentioned) | 58% | 46% |
| | Unprompted responses for where to get condoms (multiple responses allowed) | | |
| | Shop | 26% | 46% |
| | Pharmacy | 17% | 15% |
| | Government hospital / clinic/family planning center | 78% | 62% |
| | Adolescent clinic | 13% | 0% |
| | Private hospital/clinic/ family planning center | 39% | 0% |
| | Community volunteer | 13% | 0% |
| | Auxiliary nurse midwife | 0% | 0% |
| | Satisfactory knowledge (at least one place is mentioned) | 87% | 46% |
| | Feels could get condoms if needed | 83% | 27% |
| B | Knowledge of HIV | (n=95) | (n=14) |
| | Heard of HIV | 95% | 100% |
| | Believes risk of HIV transmission be reduced by having sex with only one uninfected partner who has no other partners (True) | 97% | 43% |
| | Believes a person can reduce the risk of getting HIV by using a condom every time they have sex (True) | 91% | 57% |
| | Believes a healthy-looking person can have HIV (True) | 92% | 79% |
| | Believes a person can get HIV from mosquito bites (False) | 56% | 7% |
| | Believes a person can get HIV by sharing food with someone who is infected (False) | 18% | 14% |
| | Correct (all five questions are answered correctly) | 33% | 36% |
| | Knows where can readily get an HIV test | 91% | 79% |

Facility resources

Annex Table 20: Availability of antiretroviral drugs in sample facilities

| A | Responses from <u>child health service providers</u> | Uganda (n=10) | Kenya (n=11) |
|---|---|------------------|-----------------|
| | ZIDOVUDINE (ZDV, AZT) TABLETS | 60% | 64% |
| | ZIDOVUDINE (ZDV, AZT) SYRUP | 10% | 91% |
| | ABACAVIR (ABC) TABLETS | 60% | 91% |
| | DIDANOSINE (ddl) TABLETS | 0% | 36% |
| | LAMIVUDINE (3TC) TABLETS | 60% | 36% |
| | LAMIVUDINE (3TC) SYRUP | 10% | 45% |
| | STAVUDINE 30 (D4T) | 0% | 36% |
| | STAVUDINE SYRUP | 0% | 9% |
| | TENOFOVIR DISOPROXIL FUMARATE (TDF) | 60% | 27% |
| | EMTRICITABINE (FTC) | 10% | 36% |
| | NEVIRAPINE (NVP) TABLETS | 100% | 73% |
| | NEVIRAPINE (NVP) SYRUP | 80% | 100% |
| | EFAVIRENZ (EFV) TABLETS/CAPSULES | 90% | 91% |
| | EFAVIRENZ (EFV) SYRUP | 0% | 36% |
| | DELAVIRDINE (DLV) | 0% | 18% |
| | LOPINAVER (LPV) | 60% | 100% |
| | INDINAVIR (IDV) | 10% | 0% |
| | NELFINAVIR (NFV) | 10% | 0% |
| | SAQUINAVIR (SQV) | 20% | 0% |
| | RITONAVIR (RTV) | 20% | 55% |
| | ATAZANAVIR (ATV) | 10% | 73% |
| | FOSAMPRENAVIER (FPV) | 10% | 9% |
| | TIPRANAVER (TPV) | 10% | 9% |
| | DARUNAVIR (DRV) | 10% | 18% |
| | ENFUVERDITE (T-20) | 10% | 0% |
| | STAVUDINE + LAMIVUDINE [D4T + 3TC] | 0% | 0% |
| | STAVUDINE + LAMIVUDINE + NEVIRAPINE [D4T + 3TC + NVP] | 0% | 18% |
| | ZIDOVUDINE + LAMIVUDINE [AZT + 3TC] | 80% | 91% |
| | ZIDOVUDINE + LAMIVUDINE + ABACAVIR [AZT + 3TC + ABC] | 60% | 55% |
| | ZIDOVUDINE + LAMIVUDINE + NEVIRAPINE [AZT + 3TC + NVP] | 100% | 100% |
| | TENOFOVIR + EMTRICITABINE [TDF + FTC] | 0% | 82% |
| | TENOFOVIR + LAMIVUDINE [TDF + 3TC] | 100% | 100% |
| | TENOFOVIR + LAMIVUDINE + EFAVIRENZ [TDF + 3TC + EFV] | 90% | 100% |
| | TENOFOVIR + EMTRICITABINE + EFAVIRENZ [TDF + FTC + EFV] | 10% | 27% |
| | Etravirine | Not assessed | 29% |
| | Rilpivirine | | 0% |
| | Elvitegravir-cobicistat-tenofovir alafenamide | | 0% |
| | Elvitegravir-cobicistat-Emtricitabine-tenofovir | | 0% |
| | Dolutegravir-abacavir-lamivudine | | 0% |
| | Emtricitabine-rilpivirine-tenofovir-elafenamide | | 0% |
| | Raltegravir | | 0% |
| | Dolutegravir | | 57% |
| | Ritonavir | | 57% |
| | Cobicistat | | 0% |
| | Maraviroc | | 0% |

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