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RESEARCH ARTICLE

Descriptive Evaluation of Prevention of Mother-to-Child Transmission of HIV Outcomes and Associated Factors in HIV-Exposed Infants at a Tertiary Teaching and Referral Hospital in Kenya

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ABSTRACT

Despite substantial scale-up of prevention of mother-to-child transmission (PMTCT) services, vertical HIV transmission remains a public health concern in sub-Saharan Africa. Facility-level evaluations are essential to assess progress toward elimination targets and identify gaps in care. This study evaluated PMTCT outcomes and associated factors among HIV-exposed infants at Nakuru County Teaching and Referral Hospital, Kenya. A retrospective review of records for 141 HIV-exposed infants was conducted, analyzing demographic characteristics, maternal antiretroviral therapy (ART) status, infant prophylaxis, feeding practices, and HIV testing outcomes at 6 weeks, 6 months, 12 months, and 24 months. The mean infant age at enrollment was 6.36 weeks (SD ±1.69), with 51% being female. Maternal ART coverage during PMTCT was 95.8%. All infants underwent HIV testing at 6 weeks, with an HIV positivity rate of 5.0%, while the overall prevalence from 6 to 24 months was 4.3%. Dual infant prophylaxis using nevirapine and zidovudine was administered to 96.5% of infants at 6 weeks, and exclusive breastfeeding was practiced among 97.2% of infants. The findings indicate that HIV prevalence among HIV-exposed infants was below the WHO elimination threshold, reflecting strong PMTCT implementation. However, retention gaps and continued seroconversion highlight the need for strengthened follow-up systems, sustained ART adherence, and reinforced infant feeding counseling to further advance the elimination of pediatric HIV.

Keywords: *Prevention of Mother-to-Child Transmission, PMTCT, HIV-exposed infants, Seroconversion, Antiretroviral prophylaxis, Breastfeeding*

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INTRODUCTION

Human immunodeficiency virus (HIV) continues to be a major global public health issue, particularly in sub-Saharan Africa where the majority of pediatric HIV infections are acquired through mother-to-child transmission (MTCT) (Donkor & Senoo-Dogbey, 2023). This (MTCT) can occur during pregnancy, labor, delivery or breastfeeding, and without effective interventions the risk of transmission ranges between 15-45 % in untreated populations globally (Hunduma et al., 2021), with even higher rates reported in some settings across Africa (Yah & Tambo, 2019). Over the past decade, considerable strides have been made with the adoption of lifelong antiretroviral therapy (ART) for pregnant and breastfeeding women. This has been associated with significant declines in pediatric HIV transmission in cases where it has been implemented effectively (Morales et al., 2022). Despite this progress, recent evidence indicates that MTCT remains above the World Health Organization (WHO) elimination target of less than 5 % in many low-resource settings (Ebenezer Ahenkan et al., 2025; Musarandega et al., 2020), and that substantial gaps persist in early infant diagnosis and retention in care for HIV-exposed infants (HEIs).

In Kenya, national efforts to expand prevention of mother-to-child transmission (PMTCT) services have shown measurable improvements in ART coverage among pregnant women living with HIV and in the uptake of early diagnosis services (Pricilla et al., 2018). Between 2013 and 2016, ART coverage among mothers in PMTCT services increased significantly, accompanied by a reduction in pediatric transmission rates, reaching approximately 2.5 % in some regions (Pricilla et al., 2018). However, even with these improvements, studies indicate that many HEIs are not tested within the recommended early infant diagnosis (EID) window, and a notable proportion of infants continue to seroconvert (Obeagu, 2025), highlighting ongoing implementation challenges around service accessibility, retention, and continuity of care.

The persistence of seroconversion among HEIs underscores the importance of understanding both the prevalence of HIV infection in exposed infants and the multifactorial predictors that influence transmission outcomes. Factors such as maternal ART adherence, timing of ART initiation, infant prophylaxis, feeding practices, and health system engagement have been shown to influence transmission risk profiles (Minda & Oljira, 2025; Okoko et al., 2017). Early initiation of ART in mothers and prompt enrollment of infants into PMTCT and EID programs are consistently associated with reduced transmission, while delays in diagnosis and mixed feeding practices have been linked to increased risk of seroconversion (Maru et al., 2009). In addition, regional disparities and differences between urban and rural settings further complicate efforts to achieve uniform outcomes across populations.

Given the dynamic nature of HIV epidemiology and health system responses, updated analyses of program data at facility level are essential for identifying local gaps and informing targeted interventions. This is particularly important in tertiary referral settings where HEIs at higher risk of loss to follow-up may be clustered. Current study aimed to analyze HEI records from Nakuru County Teaching and Referral Hospital to evaluate PMTCT outcomes and associated factors among HIV-exposed infants. Through this, we aimed to provide context-specific evidence on the effectiveness of PMTCT implementation in a Kenyan tertiary care setting, contributes to the understanding of seroconversion patterns over time, and identifies predictors that may be amenable to programmatic improvement. The findings can inform clinical practice, strengthen HIV care pathways for infants, and support national efforts towards eliminating MTCT of HIV.

METHODOLOGY

Study Design

A retrospective study design was adopted to evaluate the exposure of HIV in HEI and seroconversion to HIV+ serostatus while on PMTCT.

Study Site

The study was conducted at Nakuru County Teaching & Referral Hospital (NCTRH). This hospital serves the vast Nakuru County and its environs with a population of more than a 2.1million people (County Government of Nakuru, 2019). It was elevated to a level 6 facility in 2019 making it a national referral hospital. The hospital has a capacity of 588 beds which enables it to serve as a referral facility in the central Rift region.

Study Population

The study was a review of electronic ART and MCH medical records of mother and child pairs who received care at Nakuru County Teaching & Referral Hospital. The study was only targeting infants born between 1st January 2019 and 30th June 2020 at the facility and received subsequent care 2 years post-natal.

Sample Size Determination

The sample size was calculated using the Cochran formula where: n_0 was the sample size, z was the standard deviation at a 95% confidence level, p was the estimated proportion (p was estimated to be 10% from a previous study (Abere et al., 2018), q was taken as (1-p) and e was the level of precision that is desired.

$$\frac{Z^2pq}{(e)2} = \frac{1.96^2(0.1)(0.9)}{(0.05)2}$$

Using the above formula, we arrived at a sample size of 141 mother and child pairs.

Selection Criteria

Inclusion criteria comprised:

HIV-positive mothers who:

- Were registered in the PMTCT program at NCTRH.
- Gave birth between 1st January 2019 and 30th June 2020.
- Had more than 1 ANC visit at NCTRH during pregnancy.

Infants born to HIV-positive mothers between 1st January 2019 and 30th June 2020.

Exclusion criteria comprised:

- HIV-positive mothers who gave birth in the study period but failed to consent.
- HIV-positive mothers and HEIs who transferred to another facility from NCTRH hospital during the study period.
- HEIs whose data were missing from the system and medical records.
- HEIs below 18 months that were awaiting test results.

Sampling Technique

A convenient sampling technique was employed since the data was available and readily accessible. Participants were recruited conveniently from the PMTCT records during the study period. This technique was suitable since the sample size was attained during the time frame of the study. Furthermore, the confounding, predictor, and outcome variables were already present and could be extracted and analyzed with ease.

Data Collection Tool

Data was collected each mother-child pair using a data extraction template form. The template was split in two to have both the mother's and the child's data collected on the same form. The form was designed to measure variables from both the mother and the child and give an unambiguous response. The data collection tool was designed based on the PMTCT protocols, medical records, and a review of relevant journals. The tool was independently reviewed by two experts to ensure it captured the requisite information.

Data Collection Procedure

Once granted access to the database, the data collection tool was used to obtain data from the database. The collection tool was applied similarly to all mother-child pairs selected by convenient sampling. The data was then organized and compiled for further analysis.

Data Management and Analysis

Compiled data was uploaded to the Statistical Software for Social Sciences (SPSS) version 25. Incompleteness and inconsistencies in the data was compared with the data that was collected manually using the data collection tool and necessary corrections were made. Descriptive statistics was used to compute social demographic characteristics. For age which was a continuous type of data measurement, central tendencies were carried out. For gender, proportions and percentages were used. Pie charts and bar graphs were used to represent categorical data in frequencies and percentages. Seroconversion incidence was represented as a percentage on the pie chart. The independent variables were categorized as categorical or continuous.

Study Variables

The level of HIV seroconversion among HEI was the dependent variable while maternal, demographic, child, clinical, and obstetric factors were the independent variables. Maternal factors included; knowledge of MTCT, breast condition, and CPT. Demographic factors included; age at delivery and weight at delivery. Child factors included; gestational age at birth, birth weight, ART prophylaxis, age at ART enrolment, and vaccination status. Obstetric factors included; PMTCT during ANC, ANC follows up, and mode of delivery.

Ethical Considerations

Ethical approval to conduct this research was sought from the Kabarak University Research Committee (approval no: KUREC-050223) permission to conduct and collect data was obtained from the National Commission for Science, Technology, and Innovation (permit no: NACOSTI/P/23/24404), and the Nakuru County Teaching & Referral Hospital administration. A waiver was sought for patient consent as the data pursued by this study was from records. Patient identifiers were removed before data collection to maintain patient anonymity.

RESULTS

Participant Characteristics

A total of 141 records of HEIs were reviewed, achieving 100% of the targeted sample size. The mean age of infants at enrollment was 6.36 weeks (SD ±1.69). Female infants constituted a slight majority (51%). The mean maternal age was 35.88 years (SD ±5.92). The primary entry point into the HIV patient record system was the MCH clinic, accounting for 95.8% of cases. Other entry points included inpatient services (2.1%), comprehensive care clinic (CCC) (1.4%), and maternity services (0.7%) as seen in figure 1 below.

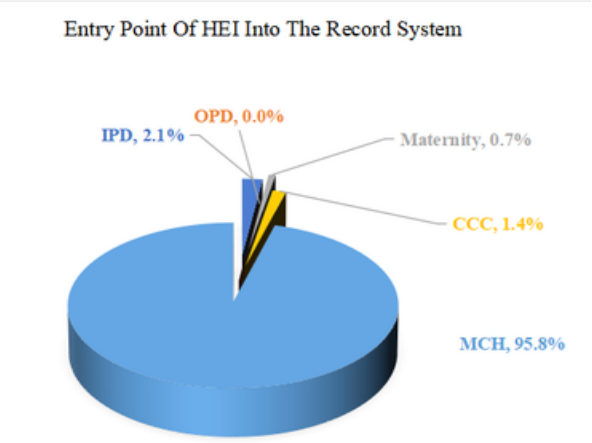


Figure 1: Point of Entry of HEI into the Hospital HIV Patient Record System

Maternal ART Status During PMTCT

Most mothers (n = 135, 95.8%) were receiving highly active antiretroviral therapy (HAART) during the PMTCT period. Three mothers (2.1%) had not been initiated on HAART, while ART status was unknown for two cases (1.4%). In one case (0.7%), the infant was under the care of a guardian categorized as "other" as tabulated in table 1.

Table 1:

ART Status of Mothers Whose HEI Were Analyzed

Mothers ART status	n	Percentage
Mother on HAART	135	95.8%
Mother not on HAART	3	2.1%
Unknown	2	1.4%
Others	1	0.7%
Total	141	100%

HIV Testing Uptake and Prevalence Among HIV Exposed Infants

At 6 weeks of age, 5.0% of the infants were diagnosed as HIV positive. From 6 months through 24 months, the prevalence of HIV infection remained stable at 4.3% as shown in figure 2. This suggests that most seroconversions occurred early, with no substantial increase in cumulative prevalence after the initial testing period.

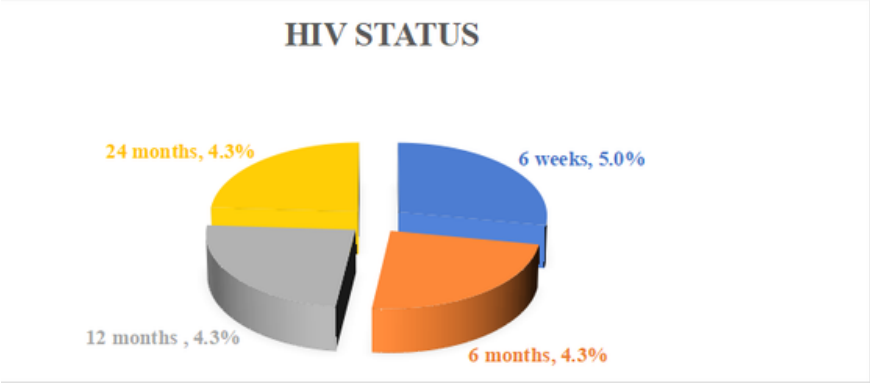


Figure 2: Prevalence of HIV Infection Amongst Infants in The First Two Years

All infants (100%) underwent HIV testing at 6 weeks of age. Testing uptake declined at subsequent time points: 61.0% at 6 months and 33.3% at 12 months. By 24 months, testing coverage increased to 95.7% as highlighted in figure 3.

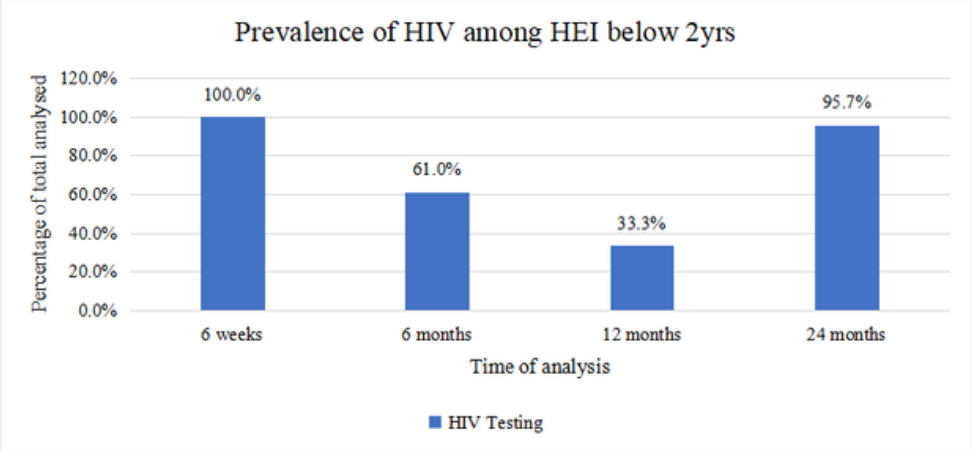


Figure 3: Rate of Infant HIV-Testing Uptake in the First Two Years

Infant ART Prophylaxis

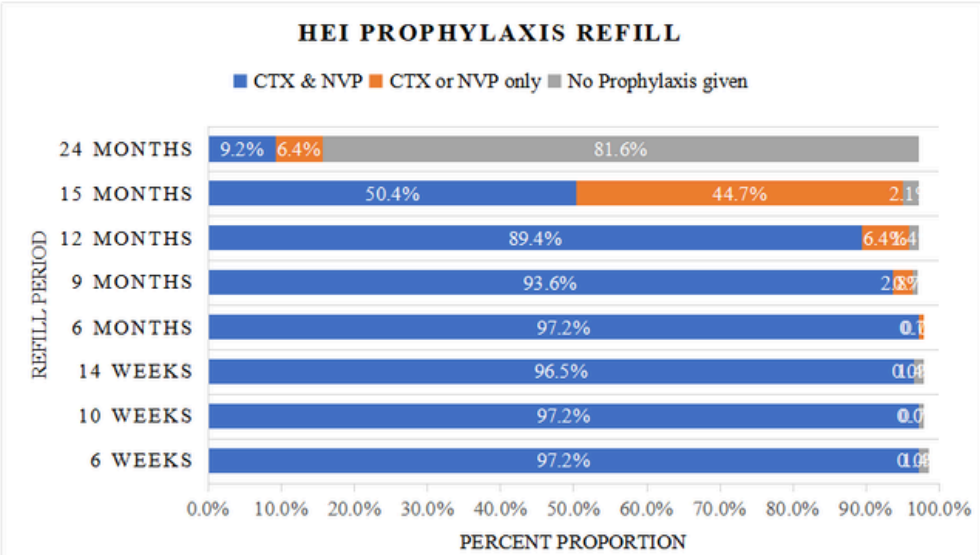
At 6 weeks, 96.5% (n = 136) of infants were initiated on dual prophylactic therapy consisting of nevirapine (NVP) and zidovudine (AZT). Only 3.5% (n = 5) did not receive ART prophylaxis. No infants received single-drug prophylaxis at this time point (see table 2).

Table 2:

ART Prophylaxis Given to HEIs

Infant ART Prophylaxis	n	Percentage
NVP	0	0%
AZT	0	0%
NVP+AZT	136	96.50%
None	5	3.50%
Others	0	0%
Total	141	100%

Regarding ongoing prophylaxis, 97.2% of infants were receiving cotrimoxazole and nevirapine at 6 weeks. However, prophylaxis coverage declined substantially over time, reaching 9.2% at 24 months. Correspondingly, the proportion of infants not receiving prophylaxis increased from 1.4% at 6 weeks to 81.6% at 24 months. After six months, some infants were transitioned to single prophylactic regimens (either cotrimoxazole or nevirapine alone), with the highest proportion (44.7%) observed after 15 months as shown in figure 4 below.

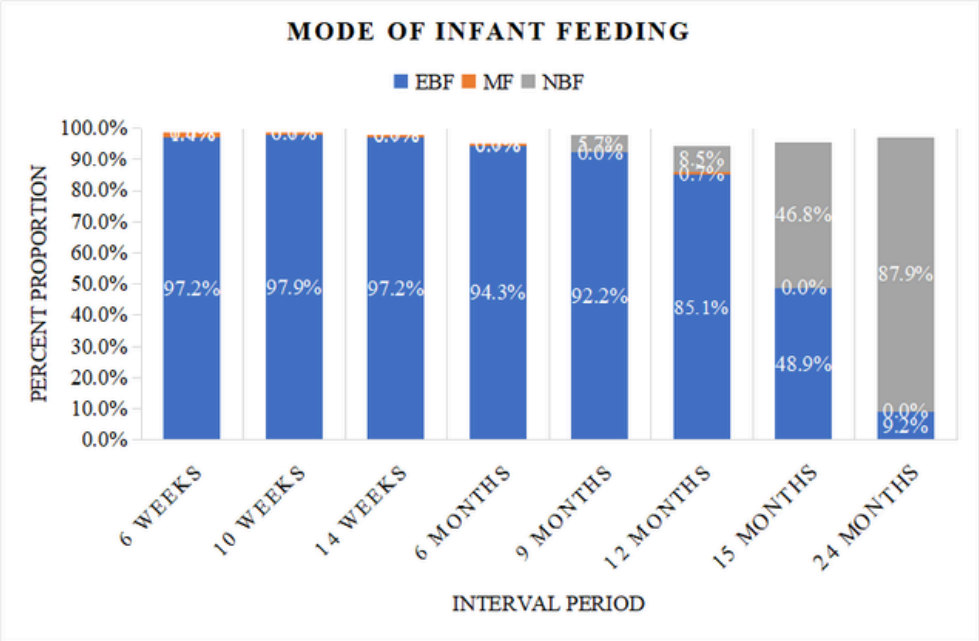


CTX *- cotrimoxazole;* ***NVP*** *- nevirapine*

Figure 4: Status of Ongoing HIV Prophylaxis Administration to HIV-Exposed Infants

Infant Feeding Practices

Exclusive breastfeeding was the predominant feeding practice, reported in 97.2% of infants irrespective of HIV status. More than 90% of infants were breastfed during the first nine months of life. At 6 weeks, only 1.4% of infants were on mixed feeding. By 24 months, 9.2% of infants were still exclusively breastfed as shown in figure 5 below. The mode of breastfeeding did not demonstrate variation in HIV prevalence over time, as seropositivity remained at 4.3% from 6 to 24 months.



***EBF**-exclusive breastfeeding; **MF**- mixed feeding; **NBF**- non breastfeeding*

Figure 5: Analysis of Modes of Feeding Employed by Mothers with HIV

Bivariate Analysis of Factors Associated with Seroconversion

Bivariate analysis revealed statistically significant associations between seroconversion and several variables as shown in table 3. Maternal ART status during pregnancy or breastfeeding (yes vs. no) was significantly associated with infant HIV status (χ^2 = 32.186, p < 0.001), with infants of mothers not on ART having 44 times higher odds of seroconversion (OR = 44.000; 95% CI: 6.152-314.682). Infant ART prophylaxis (yes vs. no) showed a strong association (χ^2 = 39.538, p < 0.001; OR = 65.500; 95% CI: 7.952-556.138). Exclusive breastfeeding at six months (yes vs. no) demonstrated a significant protective effect (χ^2 = 22.661, p < 0.001; OR = 0.036; 95% CI: 0.015-0.084). The entry point into the HIV care system (categorized as prevention of mother-to-child transmission [PMTCT] vs. other entry points) was also significantly associated with seroconversion (χ^2 = 32.186, p < 0.001; OR = 44.000; 95% CI: 6.152-314.682).

Table 3:

Bivariate Analysis of Independent Variables and Seroconversion

Variable	Chi square	P value	Odds ratio	Confidence interval
Maternal ART	32.186	< 0.001	44.000	6.152-314.682
Infant ART	39.538	< 0.001	65.500	7.952 - 556.138
EBF at 6 months	22.661	< 0.001	.036	0.015 - 0.084
Entry point	32.186	< 0.001	44.000	6.152 - 314.682
Variable	Chi square	P value	Odds ratio	Confidence interval

DISCUSSION

This study was conducted to determine the prevalence of HIV infection among HIV-exposed infants and to identify factors associated with seroconversion within the first two years of life at Nakuru County Teaching and Referral Hospital. The rationale was grounded in the persistent burden of vertical HIV transmission in sub-Saharan Africa despite widespread implementation of prevention of mother-to-child transmission strategies. Although Kenya has made substantial progress in expanding maternal antiretroviral therapy and early infant diagnosis, transmission has not been completely eliminated,

and facility-level evaluations remain critical for identifying contextual gaps in service delivery.

The observed HIV prevalence of 4.3% among HEIs from 6 to 24 months suggests that transmission rates in this tertiary facility are approaching the World Health Organization elimination threshold of below 5% in breastfeeding populations (World Health Organization [WHO], 2010). This finding aligns with recent national estimates indicating declining mother-to-child transmission (MTCT) rates in Kenya following scale-up of lifelong ART under Option B+ (National Syndemic Disease Control Council, 2024). This means that high ART coverage (95.8% in this cohort) likely contributed substantially to reducing infant infections. The universal HIV testing at 6 weeks (100%) further reflects strong adherence to EID guidelines, which recommend virological testing within the first two months of life (WHO, 2011).

However, testing uptake declined at 6 and 12 months before rising again at 24 months, suggesting retention gaps during the postnatal follow-up period. Similar attrition patterns have been reported in East African PMTCT programs, where loss to follow-up between early diagnosis and later confirmatory testing remains a significant barrier to elimination goals (Humphrey et al., 2022). This indicates that while initial enrollment into care is effective, sustained engagement of mother-infant pairs require strengthening.

Bivariate analysis demonstrated strong associations between seroconversion and maternal ART status, infant ART prophylaxis, exclusive breastfeeding, and point of entry into care. These findings are consistent with established evidence that absence of maternal ART and inadequate infant prophylaxis significantly increase MTCT risk (Ankunda et al., 2025). The protective association observed with exclusive breastfeeding at six months is also supported by literature demonstrating that, in the context of effective maternal ART, exclusive breastfeeding carries lower transmission risk than mixed feeding due to reduced mucosal inflammation and improved gut integrity (Kolarova - Dimitrova & Dimitrova, 2022). This reinforces current PMTCT counseling messages promoting exclusive breastfeeding alongside sustained ART adherence.

Overall, the results indicate that high ART coverage and appropriate infant feeding practices are central to minimizing vertical transmission. The findings highlight that elimination targets are achievable within routine care settings but require consistent follow-up and targeted retention strategies.

Conclusion

This study demonstrated a 4.3% HIV prevalence among HIV-exposed infants (HEIs) within the first two years of life at Nakuru County Teaching and Referral Hospital, indicating substantial progress toward the World Health Organization elimination threshold of <5% in breastfeeding populations. The high maternal ART coverage (95.8%), universal early infant diagnosis at six weeks, and widespread initiation of infant prophylaxis reflect strong implementation of PMTCT guidelines within the hospital. These findings suggest that when maternal ART uptake and early testing protocols are effectively operationalized, vertical transmission can be markedly reduced. However, important gaps remain. Follow-up testing rates declined significantly at 6 and 12 months, highlighting weaknesses in retention across the continuum of care. The results indicate that preventing early transmission is achievable, but maintaining engagement of mother-infant pairs throughout breastfeeding and postnatal follow-up remains a critical challenge. The findings call for targeted strengthening of postnatal retention systems, including improved appointment tracking, community-based follow-up mechanisms, and integration of PMTCT services within routine maternal-child health platforms. Health systems should prioritize adherence support for maternal ART, reinforce exclusive breastfeeding education, and ensure timely repeat infant testing to prevent missed seroconversion events. Thus, while PMTCT services at the hospital are performing well in reducing early infant HIV infections, significant elimination of mother-to-child transmission will require sustained ART adherence, strengthened follow-up systems, and consistent implementation of evidence-based infant feeding practices.

Recommendations

- Based on the findings of this study, we propose the following to strengthen PMTCT outcomes and further reduce HIV seroconversion among HIV-exposed infants:
- Although early infant diagnosis uptake at 6 weeks was optimal, follow-up testing at 6 and 12 months declined substantially. The hospital should implement structured retention strategies, including appointment reminder systems (SMS or phone tracking), community health worker follow-up, and mother-infant pair tracking registers to improve continuity of care and reduce missed testing intervals.

- Exclusive breastfeeding at six months emerged as an independent protective factor against seroconversion. Strengthened, standardized infant feeding counseling should be incorporated into antenatal, delivery, and postnatal services.
- Infant prophylaxis coverage was high at 6 weeks but declined over time. Clear documentation, standardized follow-up protocols, and regular audit of prophylaxis completion rates should be implemented to prevent premature discontinuation where indicated. Healthcare workers should ensure alignment with updated national PMTCT protocols.

Overall, the hospital should transition from focusing primarily on early enrollment and ART initiation to a comprehensive lifecycle approach that emphasizes retention, adherence, exclusive breastfeeding support, and systematic monitoring. Sustained investment in these areas will be essential to move from transmission reduction toward complete elimination of pediatric HIV infection.

Conflict of Interest

The authors declare no conflict of interest.

REFERENCES

Abere, M. N., Omoni, G. M., Odero, T. M., & Atai, P. O. (2018). Status of New HIV Infections among Infants Born of HIV Positive Mothers on Prevention of Mother to Child Transmission at Kisii Teaching and Referral Hospital, Kenya. Open Journal of Pediatrics, 08(04), 347-365. https://doi.org/10.4236/ojped.2018.84035

Ankunda, C., Emunyu, J., Kyomuhangi, B., Namasambi, S., Sserunjogi, C., Mumbere, I., & Nakaweesi, J. (2025). Infant Sero-protection: Comparing Antiretroviral therapy, Maternal and Infant Factors Influence on Infant HIV acquisition in Uganda: A six-year Real-World Perspective. MedRxiv Preprint. https://doi.org/10.1101/2025.06.20.25329979

County Government of Nakuru. (2019). County Government of Nakuru Annual Development Plan 2020-2021 Finance and Economic Planning. https://new.ipfglobal.or.ke/wp-content/uploads/2023/10/6.-NAKURU-ADP-2020-2021.pdf

Donkor, D., & Senoo-Dogbey, V. (2023). Prevention of mother to child transmission of Human Immunodeficiency virus (HIV): What do Ghanaian Midwives know? International Journal of Africa Nursing Sciences, 19(100610). https://www.sciencedirect.com/science/article/pii/S2214139123000859

Ebenezer Ahenkan, Asare-Bediako, A., Kingsley Adeoye Damilare, Antwi-Agyei, D., Atawuchugi, P., Osei-Owusu, F., Agyemang, S. K., Konadu, G., Opoku, R. A., Yeboah, K. O., Oumou Maiga-Ascofare, Boakye-Gyasi, E., & Newman Osafo. (2025). Prevalence and Predictors of Mother-to-Child Transmission of Human Immunodeficiency Virus (HIV) among HIV-exposed Infants. International Journal of Maternal and Child Health and AIDS, 14(2025), e014-e014. https://doi.org/10.25259/ijma_5_2025

Humphrey, J. M., Songok, J., Ofner, S., Musick, B., Alera, M., Kipchumba, B., McHenry, M. S., Carlucci, J. G., Park, J., Mwangi, W., Yiannoutsos, C., Bakoyannis, G., & Wools-Kaloustian, K. (2022). Retention in care and viral suppression in the PMTCT continuum at a large referral facility in western Kenya. AIDS and Behavior, 26. https://doi.org/10.1007/s10461-022-03666-w

Hunduma, F., Gebrehanna, E., & Adugna Debela, F. (2021). Determinants of Mother-to-Child Transmission of HIV in Public Hospitals of West Shewa Zone, Central Ethiopia: Case-Control Study. HIV/AIDS - Research and Palliative Care, 2021(13), 435-443. https://doi.org/10.2147/hiv.s299585

Kolarova - Dimitrova, M., & Dimitrova, M. (2022). Breastfeeding by HIV-positive women - benefit or risk. Social Medicine, 30(4), 4. https://doi.org/10.14748/sm.v30i4.9999

Maru, S., Datong, P., Selleng, D., Mang, E., Inyang, B., Ajene, A., Guyit, R., Charurat, M., & Abimiku, A. (2009). Social Determinants of Mixed Feeding Behavior Among HIV-Infected Mothers in Jos, Nigeria. AIDS Care, 21(9), 1114-1123. https://doi.org/10.1080/09540120802705842

Minda, Z., & Oljira, L. (2025). HIV vertical transmission linked to virological failure in pregnant women on ART. AIDS Research and Therapy, 22(1). https://doi.org/10.1186/s12981-025-00820-x

Morales, J. A., Mutinta Hamahuwa, Moyo, N., Mutanga, J. N., Schue, J. L., Maunga, S., Thuma, P. E., Moss, W. J., & Sutcliffe, C. G. (2022). Factors associated with antiretroviral therapy use among pregnant women in rural and urban settings in Southern Province, Zambia: 2016-2019. Tropical Medicine & International Health, 27(10), 902-912. https://doi.org/10.1111/tmi.13816

Musarandega, R., Robinson, J., Sen, P. D., Hakobyan, A., Mushavi, A., Mahomva, A., & Woelk, G. (2020). Using the critical path method to rollout and optimise new PMTCT guidelines to eliminate mother-to-child transmission of HIV in Zimbabwe: a descriptive analysis. BMC Health Services Research, 20(1). https://doi.org/10.1186/s12913-020-05900-4

National Syndemic Disease Control Council. (2024). The Kenya HIV Modes of Transmission Study Report 2024 National Syndemic Disease Control Council Ministry of Health Kenya. In nsdcc.go.ke. https://analytics.nsdcc.go.ke/estimates/KMoT%20Report%20-%20November-2024.pdf

Obeagu, E. I. (2025). Early infant diagnosis: a pillar in preventing mother-to-child HIV transmission- a narrative review. Annals of Medicine & Surgery, 87(10). https://doi.org/10.1097/ms9.0000000000003818

Okoko, N. A., Owuor, K. O., Kulzer, J. L., Owino, G. O., Ogolla, I. A., Wandera, R. W., Bukusi, E. A., Cohen, C. R., & Abuogi, L. L. (2017). Factors associated with mother to child transmission of HIV despite overall low transmission rates in HIV-exposed infants in rural Kenya. International Journal of STD & AIDS, 28(12), 1215-1223. https://doi.org/10.1177/0956462417693735

Pricilla, R. A., Brown, M., Wexler, C., Maloba, M., Gautney, B. J., & Finocchario-Kessler, S. (2018). Progress Toward Eliminating Mother to Child Transmission of HIV in Kenya: Review of Treatment Guidelines Uptake and Pediatric Transmission Between 2013 and 2016-A Follow Up. Maternal and Child Health Journal, 22(12), 1685-1692. https://doi.org/10.1007/s10995-018-2612-0

WHO. (2010). Towards the Elimination of Mother-To-Child Transimission of Hiv. Who.int; World Health Organization. https://iris.who.int/server/api/core/bitstreams/d00f7ac2-7e4a-4c89-9587-13606cbc779a/content

World Health Organization. (2011). Diagnosis of HIV infection in infants and children. Nih.gov; World Health Organization. https://www.ncbi.nlm.nih.gov/books/NBK304129/

Yah, C. S., & Tambo, E. (2019). Why is mother to child transmission (MTCT) of HIV a continual threat to new-borns in sub-Saharan Africa (SSA). Journal of Infection and Public Health, 12(2), 213-223. https://doi.org/10.1016/j.jiph.2018.10.008