Prevalence of HIV and Associated Risk Factors Among Infants Born to HIV Positive Mothers Attending Entebbe Regional Referral Hospital.

Keefa Wamala[a,1], Ronald Nuwamanya[a], Moses Muwanga[b]

[a] Department of Biosecurity, Ecosystems & Veterinary Public Health, College of Veterinary Medicine, Animal Resources and Biosecurity, Makerere University

[b] Entebbe Regional Referral Hospital

Abstract

Background:[a]

Uganda has an estimated 1.4 million people living with HIV with about 52,000 infections occurring every year. In 2018, 160,000 children were reported to have become infected with HIV. Globally, HIV exposed infants have delayed access to Early Infant Diagnosis (EID) of HIV, thus hampering efforts towards zero new infections. In Uganda, the prevalence of HIV among infants is not recorded, peak mortality for infants born with HIV occurs between 2 and 3 months of age. Vertical transmission of HIV from mother to child is the second commonest route of transmission of HIV in Uganda accounting for 18% of all new infections. This study assessed the prevalence of HIV and associated risk factors among infants born to HIV positive mothers attending Entebbe regional referral hospital.

Methodology:

A cross-sectional study was conducted at a paediatric ward and Mother-Child Health (MCH) General Department of Entebbe Regional Referral Hospital. The study included 78 HIV-exposed infants whose blood samples were collected and analyzed to know their HIV status and data about risk factors was also collected. Data were collected using questionnaires from mothers. Data were then entered into an Excel spreadsheet and analysed by SPSS Version 20.

Results:

The prevalence of HIV infection among HIV exposed infants is 5.1%. Delay in child diagnosis, breastfeeding was the factors that increased the risk of mother-to-child transmission of HIV in this study.

Conclusion and recommendations:

Having such a significant figure greater than the proposed WHO recommendation of less than 5% new infections in infants in the era of the world's pledge to eliminate MTCT of HIV is unbearable therefore, interventions need to be done to lower this prevalence.

[a]**Email: keefawamala@gmail.com**

Received: 29th/12/2020 Accepted: 21st/01/2021 Journal of Pediatrics and Child Health

1 Background

In 2018 alone, 770,000 people died from HIV related causes globally (Boyd *et al.,* 2020). By the end of 2018, 1.7 million people became newly infected globally with approximately 37.9 million people living with HIV, Of the latter, 62% are adults and 53% are children below the age of 14 years (USAID,2020). Africa is the most affected region globally with 25.7 million people living with HIV as of 2018 and it accounts for two thirds of the global new HIV infections (Forsythe *et al.,* 2019). Uganda has an estimated 1.4 million people living with HIV with about 52,000 infections occurring every year. 2.6 million of children under 15 years were living with HIV. Of the latter, 88% are from Sub- Saharan Africa. Eastern And Southern Africa is home to more than 60% of children and adolescents living with HIV (ESAR- regional snarpshort 2018). In Uganda, the prevalence of HIV among children aged 0-14 is 0.5% which corresponds to approximately 95,000 children living with HIV in Uganda (UPHIA AUGUST 2017).

Globally, HIV exposed infants have delayed access to Early Infant Diagnosis (EID) of HIV, thus hampering efforts towards zero new infections. WHO in 2019 reported that up to 80% of exposed infants would not have sero-converted if they had access to EID (Kagunda, 2018). 3 in every 4 HIV-exposed infants (HEI's) have delayed access to EID services leading to high HIV related childhood deaths in the Sub –Saharan Africa despite the availability of ART (Anaba *et al.,* 2019). Indeed, vertical transmission of HIV from mother to child is the second commonest route of transmission of HIV in Uganda accounting for 18% of all new infections. By default, these new infections are in children born to HIV-positive mothers. Peak mortality for infants born with HIV occurs between 2 and 3 months of age. Without treatment, up to 30% of the infected children will die before their first birthday and 50% by their second birthday if not placed on life saving ART.(Ndirangu, 2010).

A risk factor to infant infection is unsuppressed viral load in positive mothers. Other factors include; premature gestational age, breastfeeding, exposure to infectious agents and poverty, utero alteration amongst other factors (Slogrove, 2016).

According to Ministry of Health Uganda Report 2013, pointed out factors that increase the risk of HIV transmission between mother and baby: High viral load in mother, recent HIV infection, having advanced HIV or AIDS, low immunity, poor nutrition, presence of other STIs, Breast conditions of mother/mouth conditions of baby. In the same report, they indicated factors that decreases the risk of HIV transmission between mother and baby: Mother on ART and adheres to her ARV regimen, Partner supportiveness to the mother and her ART regimen, Measures to prevent mother from acquiring STIs (Syphilis or Herpes simplex II), Exclusive breast feeding and adherence to recommended infant feeding options and ensuring mother continues to attend ANC visits and comes for PNC visits.

Studies by (Evans *et al.,* 2016) show how access to ART can prevent HEI's from sero-conversion and can drastically reduce infant mortallity and HIV progression in HIV infected infants especially if initiated early before immunological and clinical disease progression. According to WHO, ART is a public health priority where it is recommended that all HIV exposed infants should be initiated on ART immediately after diagnosis.

Globally, an estimated 1.3 million women living with HIV become pregnant every year. (Granich *et al.,* 2015). about 90% of children get HIV from their mothers during pregnancy, delivery, and breast feeding (Ngarina *et al.,* 2014). In Uganda vertical HIV transmission ranked second to sexual transmission for now a long time, as a leading mode of HIV infection in the country, accounting for about 18% of new infections. To achieve the elimination of mother –to — child transmission of HIV and syphilis in line with the National 90- 90-90 target for HIV epidemic control by 2030 services needs to be streamlined in order to deliver EMTCT and integration maternal, newborn, child and adolescent health (MNCAH) into services delivery platform.

Vertical transmission of HIV in Uganda remains high. Additionally, the prevalence of HIV/AIDS amongst pregnant women in Uganda remains fairly high. A combination of these and other factors predisposes infants to early exposure and possible infection with HIV if EID services are not provided. According to Uganda DHIS 2 tool, prevalence of HIV among infants in 2019 and 2018 is 1.31% (1st PCR at 10/293, 2nd PCR at 00/266 and 3rd PCR at 00/206) and 1.81% (1st PCR at 11/356, 02/226 and 00/137) respectively. Although a program to control and prevent mother to child transmission of HIV has been implemented throughout at different levels

i.e.at the hospital, district and country at large, the number of infected infants remains high in Uganda.

2 METHODOLOGY

2.1 Study Site

This study was conducted at pediatric ward and Mother Child Health (MCH) General Department of Entebbe Regional Referral Hospital. Entebbe Hospital pediatric and MCH unit handles over 1000 mothers in a month. The hospital is located in Entebbe town 30km from Kampala the capital city of Uganda and has a catchment area which includes Wakiso and parts of surrounding districts, serving a population of about 83, 100 people.

2.2 Study Design.

This was a cross-sectional study where quantitative data was collected. Infants born to HIV seropositive mothers was screened for presence of HIV using RT-PCR method and confirmed using National HIV testing algorithms. A structured questionnaire was used to collect information about risk factors for HIV-infection in exposed infants.

2.3 Ethical Consideration

A written introduction letter was obtained from the college of Veterinary Medicine Animal Resources and Biosecurity Makerere University (COVAB) which was delivered to the Director ERRH. Permission to curry out research was obtained from the Director of Entebbe Region Referral Hospital. Consent from patients/ clients was obtained, and only those that consented were included in the study. Confidentiality was maintained by using initials and study number. Only the researcher and clinician had access to the records and a participant was free to withdraw from the study at any time.

2.4 Study Population

The study subjects were HIV exposed infants from age 4weeks to 18months attending PMCT clinic and pediatric ward of Entebbe R.R.H.

2.5 Sample Size Determination

The study subjects were HIV exposed infants from age 4weeks to 18 months attending PMCT clinic and pediatric ward of Entebbe R.R.H.

2.6 Sample Size Determination.

n = $4PQ$ /1^2

Where n = Number of samples required,

P = Prevalence, Q = 1-P, I= Error, 4 = Standard

Using the prevalence of 5% infants in Ethiopia (Berhan et al., 2014).

P = 0.05, I=0.05, Q=1-0.05=0.95

n = $4x0.05x0.95$

0.05^2

n = 76 samples

Inclusion and Exclusion criteria

Inclusion criteria

Only exposed infants born to HIV seropositive mothers from age 4weeks to 18 months attending PMTCT clinic and those admitted to the pediatric ward were included in the study.

Exclusion criteria

Children that were above 18 months and those whose mothers did not consent to the study and those who were severely sick were excluded from the study.

Ethical Consideration

A written introduction letter was obtained from the College of Veterinary Medicine Animal Resources and Biosecurity Makerere University (COVAB) which was delivered to the Director ERRH. Permission to carry out the research was obtained from the Director of Entebbe Regional Referral Hospital. Consent from patients/ clients was obtained, and only those that consented were included in the study. Confidentiality was maintained by using initials and study number. Only the researcher and clinician had access to the records and a participant was free to withdraw from the study at any time.

Data Collection and analysis

All serological data collected during the study were entered into excel spreadsheets and analyzed by SPSS Version 20. Data collected using questionnaires were collated and entered into excel spreadsheets for analysis using excel software.

Procedure for Collection and Analysis

Blood samples (1 to 2 ml) were collected from the heel or big toe and finger using a capillary tube system. The sample was analyzed in Lab for HIV 1/2 antibodies using an HIV rapid kit (determine, stat pack and SD BIOLINE for infants at 18 months and use of RT-PCR for infants below 18 months). Samples that showed positive on PCR were sent to CPHL through the Hub system for confirmation using dried blood spot (DBS), inconclusive results for

HIV 1/2 were sent to UVRI Lab (reference) for ELIZA tests for confirmation. The demographic data form was administered data concerning marital status occupation, education level, HIV, and history was obtained this way.

Immunochromatographic Assay for Detection of HIV 1/2

Each of the several samples was analyzed for the presence of HIV 1/2 antibodies following the testing algorithm for HIV 1/2 at ERRH. The procedure of the test was performed following the SOPS and manufacturer's manuals. Procedure for HIV testing using a whole blood sample is as follows; on Determine, applied 50ul of the sample to the sample pad of the well-labeled kit wait for I minute then applied one drop of chase buffer after then wait for 15minutes but negative results wait, wait up to 60 minutes, on Stat- Pak, applied 5ul loop to the sample pad of a well-labeled kit wait for the sample to be absorbed in the pad then added one drop of stat pak buffer and wait for 15 minutes and not later than 20 minutes, on SD-bio line, added 20ul of the sample with a 20ul capillary pipette into a well-labeled sample well on the kit then added 4 drops of assay diluent vertically into the sample well and then wait for 10 to 20 minutes but not more than 20 minutes to read the results. Always ensured that test procedures are performed on a flat and dry surface away from sunlight.

Interpretation of result for rapid test kits

Only one pink line in the control area with no colored line in the test area represented a negative result. Two pink lines, one in the test area and one in the control area represented a positive result. For inconclusive test results a pink line always appeared in the control area, if there was no distinct pink band visible in the control area, the test had failed or the test procedure was not followed properly.

Sample processing Using RT-PCR.

Upon the arrival of samples from the collection site at the main laboratory of ERRH, it was processed using standard procedure. Sample preparation testing procedures using whole blood involved the following; labeling the sample reagent bottle with sample ID, obtain a cartridge for a specific test and label with the same ID, then open the cartridge lid then transfer 750ul of sample reagent into the sample chamber, mix the whole blood sample by inverting the tube10 times and transfer 100ul of whole blood using micropipette provided into the same chamber then close the lid run sample using the expert system within 30 minutes.

3 Limitation and Solution

Busy schedules and days at the clinic, COVID-19 outbreak in the country, financial constraints during the COVID-I9 pandemic created a delay in the analysis and compilation of my research

work. These were solved by engaging health unit staff early enough and gave priority to study participants, patience during waiting of participants to come to the clinic, and solicited funds from my savings respectively.

4 RESULTS

4.1 Socio-demographic characteristics of the mothers.

The study participants were HIV positive mothers where 96.2% were TRRK and 3.8% TRR. The majority of the women (70.5%) lived in urban residence whereas 29.5% in rural residences. More than half of the enrolled women (51.3%) had a primary level of education, 37.2% had a secondary level of education, 6.4% had a tertiary/University level of education and the remaining 5.1% had none. The majority of the mothers were civil servants, 62.5% and worked in other fields, 80.6% as represented in the table 1 below.

Missing data was not included in the analysis

4.2 HIV status of the infants.

On the enrolled infants, females constituted 53.9% and the males 46.1%. Half of the mothers had checked their infant's HIV status and the other half had not yet checked. On those who had checked the status of their children, 69.2% had done PCR at 4-6 weeks, 28.2% had done both PCR at 4-6 weeks and at 9 months whereas 2.6% had done PCR at 9 months only. 34 of the enrolled infants had records of their HIV results which were all negative as shown in the table.

Missing data was not included in the analysis

4.3 HIV status of the mother during pregnancy.

During pregnancy will the enrolled infants, 93% of women had checked their HIV status and 7% had not where 96% had a positive status and 4% a negative status. 87.7% of the mothers had been

Variable	Frequency (n=78)	Percentage
Mother's HIV status		
TRRK	75	96.2
TRR	3	3.8
Home residence location		
Urban	55	70.5
Rural	23	29.5
Level of education		
Primary	40	51.3
Secondary	29	37.2
Tertiary/University	5	6.4
None	4	5.1
Mother's occupation		
Civil servant	20	62.5
Peasant	12	37.5
Field of occupation		
Health worker	14	19.4
Others	58	80.6

informed about the HIV prevention, care and treatment during pregnancy and 12.3% claimed that they were not informed. Majority of the enrolled mothers (56.3%) had tested for their viral load during pregnancy with the enrolled infants where 87.9% had suppressing status and 12.1% had non-suppressing status as represented in the table.

Missing data was not included in the analysis

4.4 Complications during pregnancy

During pregnancy and labor, majority of women (86.1%) never had and placental infections but only 9 mothers had complaints of bacterial infections. More than half of the women (57.5%) had no complications during labor whereas the remaining 42.5% reported that they had some complications where the complications reported included prolonged labor, stimulated labor with 21.7% reporting prolonged labor, 17.4% stimulated with 34.8% reporting both prolonged labor and excessive, then 26.1% both prolonged labor and stimulated labor as shown in the table.

Missing data was not included in the analysis

KEY

H/F= Health facility

4.5 Maternal status during breast feeding

The study participants during breast feeding are represented in the table below.

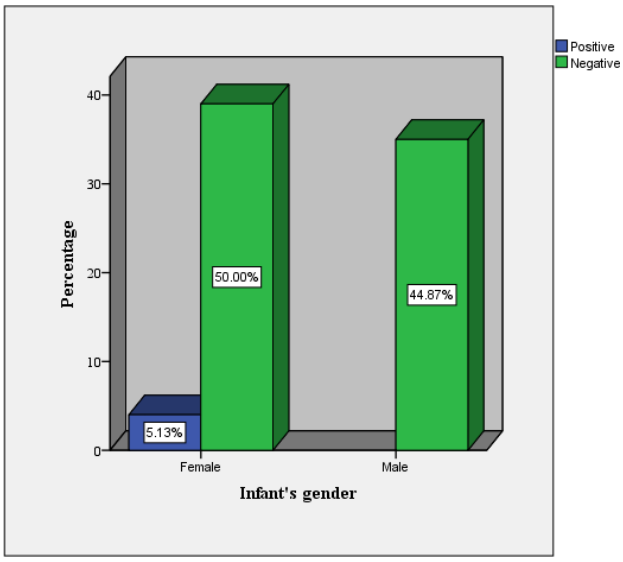
Missing data was not included in the analysis

4.6 Infant's breast feeding

Mother's reported that 87% of their infants did not have signs of mouth or intestinal infections during breast feeding whereas 13% reported that the infants had the complications which included oral thrush (66.7%) and persistent diarrhea (22.2%). 98.5% of the infants were breast fed exclusively while 1.5% were mixed fed.

Missing data was not included in the analysis

4.7 Prevalence of HIV in infants in relation to sex.



4.8 Prevalence of HIV in infants in relation to age.

5 DISCUSSION

Infants who get infected during pregnancy or while breastfeeding requires early HIV diagnosis and timely treatment. As a standard testing mechanism to diagnose HIV infection, DNA/PCR testing services have been utilized in Uganda, since the test is strong enough to determine the infection rate with a single test and also detect the antigen even if it's in very minute amounts.

In this study, the prevalence of HIV infection among HIV-exposed infants was 5.1 which is similar to the national estimate of 5% in Ethiopia (Berhan et al., 2014). The prevalence is similar although

Table 1.

Variable	Frequency (n=78)	Percentage
Infant's gender		
Female	41	53.9
Male	35	46.1
Infant's status checked		
Yes	39	50.0
No	39	50.0
What duration if checked		
PCR at 4-6 weeks	27	69.2
PCR at 9 months	1	2.6
PCR at 4-6 weeks, PCR at 9 months	11	28.2
Child's HIV status		
Negative	34	100.0

Variable	Frequency (n=78)	Percentage
Tested for HIV during pregnancy		
Yes	53	93.0
No	4	7.0
Status if tested		
Positive	48	96.0
Negative	2	4.0
Informed about HIV prevention, care and treatment		
Yes	64	87.7
No	9	12.3
Tested for viral load		
Yes	40	56.3
No	31	43.7
Viral load status during pregnancy		
Suppressing	29	87.9
Non suppressing	4	12.1
Tested for CD4 during pregnancy		
Yes	5	14.7

No	29	85.3
CD4 status		
CD4<100cells/mm3	2	100.0

in Ethiopia there was representation using a bigger sample size which may change our recorded results if a bigger sample size was used. Given several interventions have been implemented to curb the prevalence of mother to child transmission of HIV, the result in this study could still be considered alarming. This study demonstrated that several factors are related to the MTCT of HIV. Although it is not consistent with other studies which revealed that infants having their PCR test done after 6 months of their age were more likely to be HIV positive than infants tested at the age of 6 weeks or between 6 weeks and 6 months (United Nations Programme on HIV/AIDS (UNAIDS), 2010; World Health Organization, 2010). It has been observed and determined that the older the infants are when they go for diagnosis, the more they are likely to be exposed to HIV infection due to the longer time of breastfeeding. The risk even doubles if a mother is not enrolled in HIV care and support during preg-

Variable	Frequency (n=78)	Percentage
Had placental infections		
Yes	10	13.9
No	62	86.1
Specific placental infection		
Bacterial infection	9	100.0
Had complications during labor		
Yes	31	42.5
No	42	57.5
Labor complications		
Prolonged labor	5	21.7
Stimulated labor	4	17.4
Prolonged labor, excessive	8	34.8
Prolonged labor, Stimulated labor	6	26.1
Comments about complications during labor		
Caesarian case	1	1.5
Delivered at H/F	60	92.3
Delivered at H/F, over bled	2	3.1
Delivered normally and fast	2	3.1
Done invasive procedures during delivery		
Yes	18	24.7
No	55	75.3
Comments about use of invasive procedures during delivery		
Caesarian case	17	94.4
Normal delivery	1	5.6
Had any other complications		
No	74	100.0

Variable	Frequency (n=78)	Percentage
Maternal CD4 count during breast feeding		
CD4<100cells/mm3	1	33.3
CD4>100cells/mm3	2	66.7
Comments about maternal CD4 count during breast feeding		
No	3	4.0
Not applicable	2	2.7
Not done	68	90.7
Not sure	2	2.7
Maternal plasma viral load		
VL>1000 copies/ml	4	10.5
VL<1000 copies/ml	34	89.5
Maternal nutrition status		
Good	72	93.5
Poor	5	6.5
Comments about maternal breast health		
Has some wounds	2	22.2
Never breast fed the baby	2	22.2
No sign of breast feeding	2	22.2
On the first week	2	22.2
Suspect of lesion	1	11.1

Variable	Frequency (n=78)	Percentage
Signs of mouth and intestinal infections in child		
Yes	10	13.0
No	67	87.0
Kind of mouth and intestinal infection		
Oral thrush	6	66.7
Persistent diarrhea	2	22.2
Comments about mouth and intestinal infections in child during breast feeding		
At 5 months to date	2	28.6
Complaint of diarrhea	2	28.6
Never breast fed since birth	1	14.3
Not breast feeding	1	14.3
Skin rush	1	14.3
Currently breast feeding		
Yes	60	77.9
No	17	22.1
Modes of breast feeding		
Exclusive	64	98.5
Mixed feeding	1	1.5
Child's HIV status		
Positive	4	5.1
Negative	74	94.9

Gender	Samples tested	No. /% positive
Female	43	4(9.3%)
Male	35	0(0.0%)
Total	78	4(5.1%)

Age group	No. of samples tested	No. /% positive
1-6 months	37	3(8.1%)
>6 months	41	1(2.4%)
Total	78	4(5.1%)

nancy, labor, and the post-partum period. Maternal ART and infants' ARV prophylaxis are effective interventions to curb the MTCT of HIV during this time (Mirkuzie, Hinderaker, & Mørkve, 2010; World Health Organization, 2016).

The study indicates that primary level of education (51.3%), delay in child diagnosis where 50% of the mothers did not know their children's HIV status, and breastfeeding status of the mother where 77.9% of them reported that they were still breastfeeding may be the reasons for the high prevalence. Most of the infants were born at the Health facility hence the number of infected is low, this is because HIV positive women attending skilled delivery service would be given antiretroviral treatment or antiretroviral prophylaxis to prevent mother to child transmission of HIV during labor and delivery. Moreover, HIV exposed newborns may have the opportunity to receive ARV prophylaxis immediately, thereby minimizing the risk of acquiring

HIV infection during labor and delivery as the highest proportion of newborns are infected during this time. This finding is consistent with studies done in Ethiopia and Tanzania (Lange, 2002; Shargie, Eek, & Abaychew, 2011).

This research's findings indicated that the progress that has been made to produce an HIV free generation is very slow.

6 CONCLUSIONS AND RECOMMENDATIONS

7 CONCLUSION

The proportion of infected infants born to HIV infected mothers is unacceptably high. All the positive infants were females and between 1-6 months of age. Delayed diagnosis, education level, nutrition, knowledge gap, infections, inadequate retention into care, loss of follow-up, mixed infant feeding practice, and failure to provide at all or shorter duration of HIV treatment were the factors that increased the risk of mother-to-child transmission of HIV.

RECOMMENDATIONS

There is a lot to be done, integrated and audience-specific education and promotion of using comprehensive HIV care and support services should be strengthened. Research is needed to explore reasons related to woman's failure to use HIV care and support services in Uganda. The factors that lead previously HIV negative mothers to turn positive even after safe delivery, there is a need to determine the reasons as to why females represent the highest percentage of positive infants. Assessing the risk among private providers may also reveal valuable information.

Acknowledgement

Special appreciation goes to Sr. Mutonyi Walimbwa, and Nicolas Mulindwa for all the effects they have put into come up with this project report. My father and wife are highly appreciated for their financial and emotional support. Finally, I would like to extend my heartfelt gratitude to the faculty of Veterinary Medicine for developing a curriculum of biomedical Laboratory technology. This has been a wonderful experience.

A References:

1). Anaba, U. C., Sam-Agudu, N. A., Ramadhani, H. O., Torbunde, N., Abimiku, A., Dakum, P & Charurat, M. (2019). Missed opportunities for early infant diagnosis of HIV in rural North- Central Nigeria: A cascade analysis from the INSPIRE MoMent study. PLoS ONE. https://doi.org/10.1371/journal.pone.0220616

2). Berhan, Z., Abebe, F., Gedefaw, M., Tesfa, M., Assefa, M., & Tafere, Y. (2014). Risk of HIV and associated factors among infants born to HIV positive women in Amhara region, Ethiopia: A facility based retrospective study. BMC Research Notes. https://doi.org/10.1186/1756-0500-7-876

3). Berhan, Z., Abebe, F., Gedefaw, M., Tesfa, M., Assefa, M., & Tafere, Y. (2014). Risk of HIV and associated factors among infants born to HIV positive women in Amhara region, Ethiopia: A facility based retrospective study. BMC Research Notes. https://doi.org/10.1186/1756-0500-7-876

4). Boyd, A.T., Oboho, I., Paulin, H. *et al.* Addressing advanced HIV disease and mortality in global HIV programming. *AIDS Res Ther* 17, 40 (2020). centered outcomes research institute. *Health Affairs*. https://doi.org/10.1377/hlthaff.2018.0507

5). Evans, C., Jones, C. E., & Prendergast, A. J. (2016). HIV-exposed, uninfected infants: new global challenges in the era of paediatric HIV elimination. The Lancet Infectious Diseases. https://doi.org/10.1016/S1473-3099(16)00055-4

6). Forsythe, L. P., Carman, K. L., Szydlowski, V., Fayish, L., Davidson, L., Hickam, D. H., … Anyanwu, C. U. (2019). Patient engagement in research: Early findings from the patient

7). Forsythe, L. P., Carman, K. L., Szydlowski, V., Fayish, L., Davidson, L., Hickam, D. H., … Anyanwu, C. U. (2019). Patient engagement in research: Early findings from the patient- centered outcomes research institute. Health Affairs. https://doi.org/10.1377/hlthaff.2018.05067

8). Granich, R., Gupta, S., Hersh, B., Williams, B., Montaner, J., Young, B., & Zuniga, J. M. (2015).

9). Kagunda, E. W. (2018). Clinical Audit on Management of Hiv Exposed Uninfected Infants (Heis) 0-24 Months Old in 2016_17 at the Lea Toto Program, Nairobi, Kenya. 0–24.

10). Lange, J. M. A. (2002). Efficacy of three short-course regimens of zidovudine and lamivudine in preventing early and late transmission of HIV-1 from mother to child in Tanzania, South Africa, and Uganda (Petra study): A randomised, double-blind, placebo-controlled trial.

ABBREVIATIONS AND SYMBOLS

%	Percentage
ANC	Antenatal Care
ART	Antiretroviral Therapy
ARV	Antiretroviral
AZT	Zidovudine
BF	Breast feeding
Cart	Combination ARV therapy
CBC	Complete bloodcount
CD4	Cluster of differentiation 4
CDC	Centers for Diseases Control and Prevention
CPHL	Central Public Health Laboratories
CTX	Cotrimoxazole
DBS	Dry blood spot
DNA	Deoxyribonucleic acid
EAC	Enhanced Adherence Counselling
E.g.	For Example
EID	Early HIV Diagnosis
ERRH	Entebbe Regional Referral Hospital
EPI	Expended Program on Immunization
EMTCT	Elimination of mother to-child HIV transmission
FDC	Fixed Dose Combination
HBV	Hepatitis B Virus
HEI	HIV-exposed infant
HIV	Human immunodeficiency virus
HMIS	Health management information systems
MCH	Mother and Child Health
MOH	Ministry of Health
NAAT	Nucleic Acid Amplification Test
NAT	Nucleic Acid Testing
NNRTI	Non-Nucleoside Reverse Transcriptase Inhibitors
NVP	Nevirapine
PCR	Polymerase Chain Reaction
PI	Protease Inhibitor
PITC	Provider-Initiated HIV Testing and Counseling
PLHIV	People living with HIV
PMTCT	Prevention of Mother to Child Transmission (of HIV)
POC	Point of Care
PNC	Post Natal Care
PSEC	Patient Support Education and Counselling
QI	Quality improvement
RDT	Rapid Diagnostic Test
TB	Tuberculosis
TDF	Tenofovir
UNHLS	Uganda National Health Laboratories
UPHIA	Uganda Population-Based HIV Impact Assessment

UNAID	United Nations AIDS Program
VHT	Village health team
WHO	World Health Organization
YCC	Young Child Clinic
TRRK	Known HIV positive
TRR	Newly Diagnosed HIV positive
TR	Negatively Diagnosed for HIV