



## **Psychosocial Interventions on Mother to Child Transmission of HIV in Mombasa, Kenya, a Descriptive Analysis**

Support Implementation of Comprehensive HIV Prevention, Care and Treatment Programs in  
Bomu Hospital Affiliated Sites, Coptic Hospitals, and Faith – Based Sites in the Eastern  
Slums of Nairobi, Kenya under the Presidents Emergency Plan for AIDS Relief (PEPFAR)

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### **Disclaimer**

The findings and conclusions in this report are those of the authors and do not necessarily represent the  
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## Contents

Executive Summary.....	3
Introduction .....	3
Methods.....	3
Results.....	4
Conclusion.....	4
List of Acronyms and Abbreviations .....	5
Introduction and Project Background .....	6
Problem statement .....	8
Purpose .....	8
Aim of Study.....	9
Budget.....	<b>Error! Bookmark not defined.</b>
Evaluation Methodology and Approach .....	9
Evaluation Objectives.....	14
Evaluation Type and Design .....	14
Study Setting/Area .....	14
Study Population, Inclusion and Exclusion Criteria and Sampling Frame .....	15
Data Collection Methods .....	18
Data Management .....	18
Evaluation Limitations.....	18
Ethical Considerations.....	19
Results and Findings.....	19
The PMTCT Program at Bomu Hospital, Mombasa County .....	<b>Error! Bookmark not defined.</b>
Descriptive Analysis of Respondents .....	<b>Error! Bookmark not defined.</b>
Discussion and Lessons Learnt.....	22
Dissemination Plans .....	23
References .....	25
Appendix.....	28
Patient Informed Consent Form .....	28
Curriculum Vitae .....	29
Good Clinical Practice Certificate.....	29
Conflict of Interest Statement .....	29

## Executive Summary

### Introduction

In the past decade, various interventions have been implemented by countries in Sub-Saharan Africa (SSA) to reduce the incidence of mother-to-child transmission (MTCT) of human immunodeficiency virus (HIV). While there has been significant improvement in antiretroviral therapy (ART) uptake from 25% to 92% in the last decade (UNAIDS, 2020), there remains a gap in the prevention of mother-to-child transmission (PMTCT) of HIV.

In 2020, 680,000 lives were lost due to HIV-related illnesses (World Health Organization [WHO] 2021a). Presently, an estimated 37.7 million people live with HIV (PLHIV) in the world, of which two-thirds are from SSA. (WHO, 2021a). To reduce mortalities due to HIV/Acquired immunodeficiency syndrome (AIDS), it is important to reduce the incidence of new HIV infections. Since 2014, there has been a scale-up of PMTCT of HIV services in Kenya, 92.1% of HIV-positive pregnant and breastfeeding mothers are initiated on ART (Kenya Population-Based HIV Impact Assessment [KENPHIA], 2018). Despite the high PMTCT coverage in the country, the rate of MTCT is at 11%. Kenya was included in the list of twenty-two priority countries in the Global Plan for the elimination of MTCT (eMTCT) launched by the United Nations General Assembly in 2011. (UNAIDS, 2020). Elimination of MTCT remains a key priority in Kenya's HIV epidemic response.

### Methods

Bomu rolled out a comprehensive package of psychosocial interventions as part of the PMTCT package of services in addition to ART eMTCT of HIV.

A retrospective descriptive cross-sectional study was carried out among 248 women of reproductive age (14 - 45 years) enrolled in the PMTCT program between January 2018 and March 2019 at Bomu Hospital in Mombasa County, Kenya, to describe four psychosocial interventions. The psychosocial interventions included (i) enrolment with the Kenya Mentor Mothers Program, (ii) receiving a PMTCT delivery care pack, (iii) enrolment participation in a support group, and (iv) attending the HIV exposed infants (HEI) graduation on the MTCT rates. Data were retrospectively abstracted from patient charts.; the endpoint was the polymerase chain reaction (PCR) result to detect HIV infection for the HEI at 18 months.

## Results

Out of the 248 charts extracted, a total of 230 (92.7%) PMTCT clients received combined psychosocial interventions; of whom all their infants were PCR negative. On the other hand, 18 (7.3%) clients did not receive the complete combined psychosocial interventions; of whom 1 infant was PCR positive.

## Conclusion

The program successfully implemented a combination of four psychosocial interventions for PMTCT. Additionally, the program had a low number of infants infected with HIV through MTCT. Additional studies are needed to evaluate the impact of the psychosocial interventions on reducing MTCT.

## List of Acronyms and Abbreviations

ANC - Antenatal clinic

ART - Antiretroviral therapy

CCC – Comprehensive Care Clinic

CDC - Centers for Disease Control and Prevention

CCT – Conditional Cash Transfer

HEI - HIV-exposed infants

HIV - Human Immunodeficiency Virus

KEMR – Kenya Electronic Medical Records

KENPHIA - Kenya Population-Based HIV Impact Assessment

KMMP – Kenya Mentor Mother Program

MNCH – Maternal, Newborn Child Health

MTCT - Mother-to-child transmission

NACC - National AIDS Control Council

NGO - Non-governmental Organization

PCR - Polymerase chain reaction

PEP – Post Exposure Prophylaxis

PEPFAR - Presidents Emergency Plan for AIDS Relief

PLHIV – People Living with HIV

PHDP – Positive Health Dignity and Prevention

PMTCT - Prevention of mother-to-child transmission

PrEP – PreExposure Prophylaxis

SDGs – Sustainable Development Goals

STD – Sexually Transmitted Disease

UNAIDS - United Nations Program on HIV/AIDS

USAID – United States AID

U=U – Undetectable equals Untransmissible

WHO - World Health Organization

## Introduction and Project Background

The Human Immunodeficiency Virus (HIV) belongs to the group of retroviruses. The virus is transmitted from one individual to another through unprotected sexual contact with an infected individual, percutaneous exposure to contaminated blood, and vertical transmission from an infected mother to her child (Hay *et al.*, 2020). Vertical transmission occurs during pregnancy, delivery, or breastfeeding (Centers for Disease Control and Prevention [CDC], 2021). Once the virus gets into the human body, it binds to lymphocytes, macrophages, and monocytes and eventually weakens the immune system (Hay *et al.*, 2020). Diagnosis of HIV for children older than 18 months and adults can be made by detecting the presence of antibodies in the blood (Hay *et al.*, 2020). HIV infection in children 18 months of age and below can be detected using Deoxyribonucleic acid - polymerase chain reaction (DNA-PCR) (Ministry of Health, 2012).

The virus continues to remain a major public health concern since its discovery (Bourgeois *et al.*, 2016), and by the end of 2020 had claimed more than 36 million lives worldwide (World Health Organization [WHO] 2021a). Presently, there are an estimated 37.7 million people living with HIV (PLHIV) in the world, of which two-thirds are from sub-Saharan Africa (SSA) (WHO, 2021a).

The guidelines for the initiation of antiretroviral therapy (ART) in HIV-positive individuals were revised in 2013, expanding the eligibility to a CD4 count of less than 500 cells/mm<sup>3</sup> (Doherty *et al.*, 2013). In 2015, the WHO further revised its guidelines to recommend universal treatment (test and treat) for HIV (WHO, 2015). Together with the availability of antiretroviral drugs, these revisions resulted in a decline in the prevalence of HIV in SSA by almost 30% (WHO, 2016). Furthermore, those who are at high risk are offered pre-exposure prophylaxis (PrEP) to prevent the acquisition of HIV (WHO, 2021b). Despite these interventions, the SSA region continues to report the highest number of deaths due to HIV globally (WHO, 2021a). There have been tremendous gains in ART coverage in pregnant women, achieving an estimated 82% by 2018 (Ruel *et al.*, 2021). Unfortunately, due to late diagnosis of HIV among these women, neonates are still at a high risk of vertical transmission in both high- and low-resource settings. (Ruel *et al.*, 2021).

### New vertical HIV infections by cause of transmission, global, 2020

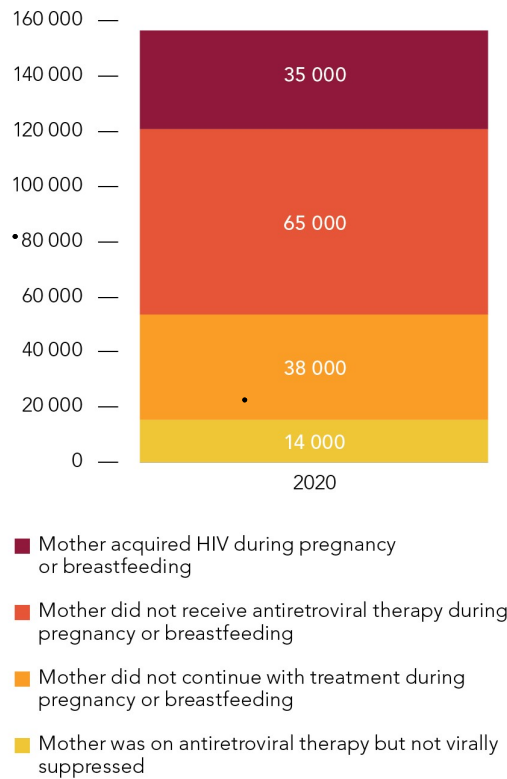


Figure 1: UNAIDS Epidemiological Estimates for Vertical Transmission of HIV (UNAIDS, 2021a)

Figure 1 shows that in 2020, over 35,000 children acquired HIV infections due to vertical transmission from mothers who contracted HIV during pregnancy and breastfeeding (UNAIDS, 2021a). An additional 38,000 infections in children were due to defaulting of mothers on ART and approximately 14,000 more from children born to mothers who were not virally suppressed (UNAIDS, 2021a).

In 2014, Kenya adopted the WHO Option B+ guidelines initiating all HIV-positive pregnant and breastfeeding mothers on ART regardless of CD4 cell count (NACSOP, 2014). A nationally representative study conducted in Kenya in 2014 revealed that about 93% of pregnant women were screened for HIV during their pregnancy, and of these, about 98% received their test results (Sirengo *et al.*, 2014). Of the HIV-positive women, 73% received

ART during their antenatal period, and 83% of the newborns were tested for HIV (Sirengo *et al.*, 2014). However, of these, 15.1% of the newborns tested were HIV positive (Sirengo *et al.*, 2014)

Since 2014, there has been a scale-up in the prevention of mother-to-child transmission (PMTCT) of HIV services in Kenya, with an overall PMTCT coverage of 76% in 2018 (NACC, 2021). Overall, 92.1% of HIV-positive pregnant mothers were initiated on ART (KENPHIA, 2018) which has further improved to approximately 95% by 2019 (UNAIDS 2021b). Despite the high PMTCT coverage in the country, the rate of mother-to-child transmission (MTCT) is at 11% (PEPFAR, 2021), and retention and viral suppression for the HIV-infected mother is still a challenge (Humphrey *et al.*, 2022).

Elimination of MTCT of HIV remains a key priority in Kenya's HIV epidemic response (NACC, 2021). Kenya was included in the list of twenty-two priority countries in the Global Plan for the elimination of MTCT (eMTCT) launched by the United Nations General Assembly (UNAIDS, 2020). The goals were (i) To reduce the number of new childhood HIV infections by 90%. (ii) reduce the number of HIV-related maternal deaths by 50% (UNAIDS, 2020). Of the 22 countries, 21 are SSA countries and the 22<sup>nd</sup> country is India (UNAIDS, 2020).

By 2019, none of the twenty-two countries had achieved their goal (Goga *et al.*, 2019).

## Problem statement

Despite major leaps taken worldwide to address the HIV epidemic, transmission of mother to child of HIV remains a major concern. Innovative methods and tailor-made interventions must be developed, validated where appropriate, and best practices disseminated in order to address this concern.

## Purpose

The purpose of this study was to fill the gap in the literature by describing tailor-made psychosocial interventions on eMTCT. The study was conducted in Mombasa County, Kenya, which is a low-middle-income country (World Bank, 2021). The study focuses on a combination of four specific psychosocial interventions that have been implemented in a sample of HIV-positive pregnant mothers in Mombasa County. The interventions were enrolment with the Kenya Mentor Mothers Program; receiving a PMTCT delivery pack that



includes a hygiene pack, some clothes for the baby, and a toy; enrolment, and participation in a support group; and attending the HIV-exposed infants (HEI) graduation ceremony.

Providing evidence-based and effective care alongside ART to pregnant and breastfeeding mothers may improve morbidity and mortality in HIV-positive pregnant mothers, reduce the MTCT of HIV, and improve neonatal morbidity and mortality due to HIV. Insights from this study may enhance the longevity and quality of lives of children born to HIV-positive pregnant women.

## Aim of Study

To describe a combination of four specific psychosocial PMTCT interventions, which include:

- a) enrolment with the Kenya Mentor Mothers Program
- b) receiving a PMTCT delivery care pack,
- c) enrolment and participation in a support group, and
- d) attending the HIV exposed infants' graduation alongside ART at the Bomu Hospital in Mombasa County.

## Evaluation Methodology and Approach

### The PMTCT Program at Bomu Hospital, Mombasa County

The Bomu hospital ANC clinic operates as an outpatient Centre from 8.00 a.m. to 5.00 p.m. five days a week. All pregnant mothers, except for those already on ART, undergo a confirmatory HIV test upon registration at the ANC. Those who are negative are counselled on how to remain negative. In addition, those who are at high risk of getting HIV are offered PrEP to prevent the acquisition of HIV infection during pregnancy/breastfeeding (WHO 2021b).

Partner testing is also offered for all clients who do not know the status of their partner. Unfortunately, not all the partners are available to be tested. All the HIV positive pregnant women are then registered in the PMTCT program and enrolled in the Kenya Mentor Mother Program (KMMP) and assigned to a mentor mother.

Bomu hospital has three mentor mothers at the ANC clinic who are available at the clinic during working hours, all five days of the week. The mentor mother is responsible for the follow-up

of clients at the facility and community level. Services offered by the mentor mothers are aligned to the KMMP (NASCO, 2012) and additional ones as per the Bomu hospital program. These include (i) adherence counselling, (ii) psychosocial support and counselling, (iii) enrolling HIV positive pregnant and breastfeeding women in a support group, (iv) offering structured treatment literacy on Positive Health Dignity and Prevention (PHDP) and Undetectable equals Untransmissible (U=U), (v) following the women with calls/home visits in case of missed appointments, (vi) getting the partners on board for support, (vii) offer health talks during clinic visits, (viii) register the women and furnish them with a PMTCT delivery care pack immediately after delivery (during the first clinic appointment at two weeks), and (ix) register the mother-baby pair for HEI graduation at 18 months and ensure participation.

Figure 3 below is a photograph (consent for using the photograph was obtained) taken at the MCH clinic at Bomu. Pregnant women and their spouses are gifted the PMTCT delivery care pack, which comprises of a basin, pampers, a *Kanga* (a simple piece of cotton fabric of about one meter and 75 centimeters by one meter and 25 centimeters, representing the culture and customs of women on the Kenyan coast), and a hygiene pack for the child. It also has an umbrella for the mother to use when coming to the clinic with the baby. The pack is given to the PMTCT mother at the first postnatal visit. This benefit has motivated mothers to come for their first postnatal visit without delay and aided in improving uptake of EID and infant prophylaxis which has resulted in a reduction of MTCT of HIV. (Pricilla *et al.*, 2018).



*Figure 2: PMTCT Mother with her partner, receiving the PMTCT care pack from the Mentor Mother at the MCH Clinic, January 2018 - March 2019, Bomu Hospital, Mombasa*

To ensure infants are retained in the program and are tested for PCR as per the guidelines, Bomu hospital rolled out the HEI graduation program to work as an incentive for mothers to ensure their babies are active and continue with timely clinic appointments. On completion of 18 months in the program and after the final PCR test, the mother-baby pair is invited to the graduation ceremony. Here, the mother receives a certificate for completion in the PMTCT/HEI program and a gift pack for the baby which has a hygiene pack, some clothes, and a toy. The cost of the package is estimated to be approximately USD 10. Due to the poor socioeconomic status of most women in sub-Saharan Africa, such incentives have demonstrated retention of the mother-baby pair in the program and thereby reduction in MTCT of HIV (Mathews *et al.*, 2016, Saleska *et al.*, 2021).



*Figure 3: PMTCT Mother and HEI participating in the HEI graduation at Bomu Hospital*

Figure 3 is a photograph (consent for using the photograph was obtained) taken during an HEI graduation ceremony in July 2018. The ceremony had over 25 mother-baby pairs in attendance. Not only did they receive the certificates and gift packs, but they also received health talks by mentor mothers and clinicians on future pregnancies and had an opportunity to interact with other PMTCT mothers and exchange their experiences.

However, not all HIV-positive pregnant women receive all four services. One reason why an HIV positive woman may not get all four psychosocial interventions is delayed enrolment in the ANC clinic and enrolment during PNC hence missing out on the delivery care pack. A client may opt-out of one or more psychosocial interventions due to personal reasons, transferring out or defaulting on treatment during the PMTCT period, and death of the infant/miscarriage of the pregnancy.

Bomu hospital has had mentor mothers since 2013. Their knowledge and experience has cascaded down to the patients, helping them better understand the PMTCT cascade (Philemon *et al.*, 2021). The mentor mothers at the site are primarily responsible for conducting the various interventions that aid in retention and viral suppression among PMTCT mothers.

Support groups are strongly highlighted by various studies in aiding reduction of MTCT of HIV (Foster *et al.*, 2014, Bateganya *et al.*, 2015, Foster *et al.*, 2017, Odiachi *et al.*, 2021, & Makina-Zimalirana *et al.*, 2022). Support groups are routinely conducted at Bomu hospital for all PMTCT mothers antenatally and postnatally.



*Figure 4: PMTCT Mother support group at the Bomu Hospital pediatric CCC conducted by the mentor mothers (wearing white aprons).*

Figure 4 is a picture (consent for using the photograph was obtained) of a postnatal support group for PMTCT mothers with their infants at Bomu Hospital in November 2018. Health education is offered in the support groups along with best practice sharing for the mothers. Questions raised by the mothers are answered by the trained mentor mothers who conduct the support groups. Emphasis on adherence to ART and retention in care is given, achieving a decrease in the MTCT of HIV ((Foster *et al.*, 2017, Philemon *et al.*, 2021, Makina-Zimalirana *et al.*, 2022).

The interventions adopted by Bomu hospital, in accordance with the Kenya PMTCT and KMMP guidelines, with a few additional services, have aided in patient retention and viral suppression in the program. These are consistent with other studies (Foster *et al.*, 2017,

Philemon *et al.*, 2021, Makina-Zimalirana *et al.*, 2022) demonstrating the importance of tailor-made interventions having an irrefutable effect on reducing MTCT of HIV. Bomu hospital may be on the path to achieving EMTCT if it continues with the various interventions mentioned above while implementing a robust PMTCT program that will address the factors leading to PCR positive infants.

## Evaluation Objectives

The objective of this evaluation was to describe the provision of a combination of four psychosocial interventions to improve the outcome of children born to HIV positive mothers attending the ANC clinic at Bomu Hospital.

## Evaluation Type and Design

A retrospective cross-sectional descriptive study design was used to describe the provision of a combination of four psychosocial interventions to improve the outcome of children born to HIV positive mothers attending the ANC clinic at Bomu Hospital.

## Study Setting/Area

The study was conducted at a single HIV center providing comprehensive HIV care and treatment to adults, children, and pregnant women. The hospital, known as Bomu hospital, is a not-for-profit registered, non-governmental organization (NGO) in Kenya, and has been in operation for the last 42 years. It is strategically located in the heart of the rural area in Changamwe, Mombasa County, Kenya, from where it serves the most underserved populations. However, the centre is visited by patients from all social classes (Bomu Hospital, 2021). The hospital has a specialized HIV care and treatment center which has been in operation since 2004.

At the time of the study, more than 12,500 PLHIV were enrolled into ART and are on follow-up on care and treatment (Bomu Hospital, 2021). At the Bomu Hospital, all HIV-positive clients are started on ART upon enrolment per the Kenya Ministry of Health (MoH) guidelines as well as WHO guidelines (WHO, 2015). The prevention, care and treatment services offered to PLHIV are free and are supported by United States President's Emergency Plan for AIDS

Relief (US PEPFAR) funds through a cooperative agreement with the US Centers for Disease Control & prevention (CDC). This includes HIV testing, laboratory monitoring, treatment, and prophylactic medicine.

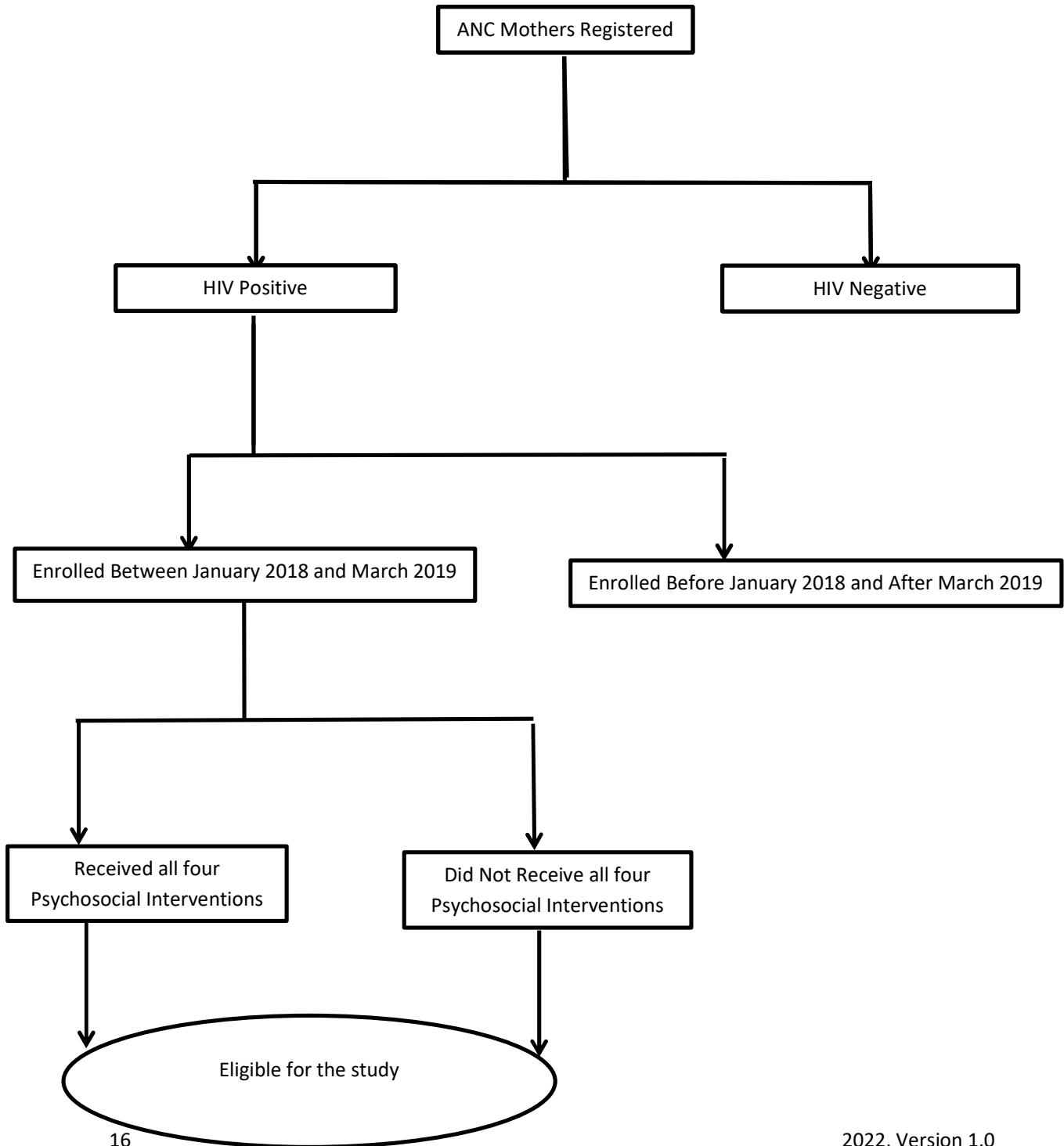
The ANC clinic is located within the premises of the Bomu hospital. Standard operating procedures (SOPs) are used to manage all women attending ANC (Bomu Hospital, 2021). On average, 50 pregnant mothers attend the ANC daily. The study staff did not collect data directly from the clients but used routinely collected de-identified data. HIV-positive pregnant mothers registered for ANC at this facility are Kenyans. There is no majority ethnic group amongst the women who access care at the center.

### Study Population, Inclusion and Exclusion Criteria and Sampling Frame

Pregnant mothers who enroll for ANC care at the Bomu Hospital undergo an HIV rapid test at their first contact if their HIV status is unknown. Women who test negative continue to receive routine care at the ANC clinic, and mothers who test positive for HIV undergo a confirmatory test as per the Kenya HIV testing service guidelines (New ART Guidelines 2018, Bomu Hospital, 2021). Pregnant mothers who are confirmed HIV positive are initiated on ART based on the Kenya MoH national guidelines (NACC, 2021). In addition, HIV-positive pregnant women are offered four psychosocial interventions. These interventions are enrolment with the Kenya Mentor Mothers Program, receiving a PMTCT delivery pack, enrolment, and participation in a support group, and attending the HEI graduation ceremony.

After delivery, the mother continues with ART (Option B+), the infant is initiated on Azithromycin (AZT) and nevirapine (NVP) prophylaxis as per the PMTCT guidelines, and exclusive breastfeeding for six months is recommended to reduce the chances of transmission (Ministry of Health, 2012). The mother-baby pair is followed at the ANC for 18 months, at which point a DNA-PCR test is conducted on the baby (NACC, 2021). Because the end point of this study is a PCR test result on the newborn at 18 months, eligibility to participate in the study was HIV-positive women who were registered for ANC care between January 2018 and March 2019 and had provided written consent for data to be abstracted from their patient charts. The above period was chosen for two reasons; i) Bomu hospital started providing PMTCT care packs to all mothers. in January 2018. Prior to that, only mothers delivering at the hospital were given care packs to encourage hospital delivery. ii) 18-month PCR testing was implemented

for all infants born to mothers enrolled in the study in March 2019. Figure 2 below shows the study flow chart demonstrating the eligibility criteria for enrolment in the study.





*Figure 5: Study Flow Chart, January 2018 - March 2019, Bomu Hospital, Mombasa*

All HIV-positive pregnant women ages 14-49 years on ART of any race and ethnicity enrolled at the ANC between January 2018 and March 2019 were included for chart review. There were no direct patient interviews. All data abstraction was done through chart reviews. The hospital offers psychosocial interventions to HIV positive pregnant women alongside ART. However, not all HIV-positive pregnant women received all four services. This was because the services offered were not mandatory.

All clients meeting the eligibility criteria were contacted by phone and provided with information about the study. This was prior to being invited to attend the hospital and provided with the participant information sheet and the opportunity to give written informed consent for a review of their charts filed at the medical records for the study. Only clients consenting to the study had their charts reviewed. The client information sheet and the consent form were prepared in English and translated to the local language, and Kiswahili. The information sheet and consent form were back translated in English to ensure preservation of the original context. The investigator read out the client information sheet and the consent form to the participant in their preferred language and provided time for questions and further elaboration on the use of the information collected. Clients who did not consent to participate in the study continued to receive the required services at the hospital. There was no financial compensation offered to clients who consented for participation in the study.

All client charts were stored in the medical records department. Each ANC patient was assigned a unique identifier which was recorded on the client chart. Study numbers were assigned to each client chart by the medical records staff. The study numbers of eligible patients with clients the relevant information were extracted from the client chart. All information was thus de-identified from the participant identifiable information (PII) and was not traceable to the individual patient. P

## Data Collection Methods

The Comprehensive Care Clinic (CCC), is a specialized clinic where HIV exposed and positive clients are attended to by a team of staff trained in the various components of HIV prevention, care and treatment. The CCC was paper-based at Bomu hospital during the period of the study but thereafter transitioned to Kenya Electronic Medical Records (KEMR) System by September 2020. Therefore, both the physical records and the KEMR were used for data abstraction. All participant charts were stored in the medical records department. Each client had a unique identifier which was recorded on the participant chart. Participant study numbers were assigned to each participant chart by the medical records staff. The study numbers of eligible participants and the relevant information were extracted from the participant chart. All information was then de-identified from the PII and would not be traceable to the individual participant.

The following information was retrieved from the participants' charts/KEMR/Registers: Name of client – used for the consent process, Comprehensive Care Clinic (CCC) Unique Identifier, age, marital status, HIV status of the male partner, physical residence, first viral load during pregnancy, breastfeeding option applied, place of delivery, interventions offered (to the mother and baby), and PCR results of the infant.

The data abstracted was at a single point in time, and no follow-up information was collected. The data abstracted was entered into a spreadsheet, the data were extracted by two independent data clerks, after which the sheet and the chart were returned to the ANC Clinic medical records department.

## Data Management

Data management and cleaning was conducted prior to conducting the analysis. Missing values were recorded. Transcription errors were corrected. Possible sources of errors, included incorrect recording from the charts and transcription errors, were checked and resolved prior to the analysis.

All staff involved in data collection underwent a training on Human Subject Protection.

## Evaluation Limitations

To address such possible areas of concerns in a chart review, data abstractors were trained on data collection from the charts. A pilot study was conducted prior to initiation of data collection proper. Inter-rater reliability was tested by asking at least two data abstractors to abstract data from the same chart. Intra-rater reliability was tested by getting a data abstractor to abstract data from the same chart on two different occasions. There was no significant difference between the two abstractors and no difference in the data abstracted by the same abstractor (Cohen Kappa agreement >0.9, Pennsylvania State University, 2016).

Another limitation for the study was that infants who did not have the PCR EID results at 18 months were not included in the study despite the mothers being enrolled in the period of the cooperative agreement.

Finally, it is important to note that this is a descriptive evaluation. It may be worthwhile to conduct an exploratory study or with a larger sample size to determine the impact of such innovative interventions and use specific end points such as the PCR at 18 months of age.

## Ethical Considerations

The study protocol was reviewed and approved by KNH-UON ERC Committee. It was also reviewed in accordance with CDC human research protection procedures and was determined to be research, but CDC investigators did not interact with human subjects or have access to identifiable data or specimens for research purposes.

## Results and Findings

### Descriptive Analysis of Respondents

350 women were enrolled in the PMTCT program during the period of study, and of them, we obtained 287 consented, 36 were lost to follow up [LTFU] (defined as clients who could not be traced and did not report back to the clinic after 28 days of missing an appointment), with 27 transfer-out from the program to other facilities at the time of the study period. Of the 287, only 248 were eligible for the study.

**Table 1: Outcome for PMTCT Clients pregnancy/infants - January 2018 - March 2019, Bomu Hospital, Mombasa**

Miscarriages	27
IUFD (Inter uterine fetal death)	6
Died as infants before the 18-month PCR	8

The above table has the breakdown of the 39 clients who consented but were not included in the study because there was no end point for the study (PCR result for the HEI).

General patient level data were extracted with the following variables: age, marital status, first viral load (VL) during pregnancy, breastfeeding option used, place of delivery, interventions offered (to the mother and baby) and the PCR results of the infant. The data were important in understanding the demographics of the study participants in relation to the study objectives and presented below are the findings.

**Table 2: General patient level data for the 248 participants recruited in the study at Bomu Hospital, Mombasa**

	Total (n=248)	Percentage (n=248)
<b>Mother age band</b>		
10-14 years	1	0.4
15-19 years	6	2.4
20-24 years	22	8.9
25-29 years	51	20.6
30-34 years	96	38.7
35-39 years	53	21.4
40-44 years	18	7.3
45-49 years	1	0.4
<b>Marital status</b>	<b>204</b>	<b>323</b>
Married	222	89.5
Separated	26	10.5

<b>Breastfeeding option used</b>		
Exclusive Breastfeeding (EBF)	245	98.8
Exclusive Replacement Breastfeeding (ERF)	2	0.8
Mixed Feeding (MF)	1	0.4
<b>Partner HIV status</b>		
Positive	125	53.4
Unknown	123	46.6
<b>Viral suppression of mother at baseline</b>		
Suppressed	161	64.9
Not suppressed	17	6.9
Not done	70	28.2
<b>Interventions received</b>		
Combined psychosocial interventions	230	92.7
Did not receive combined psychosocial interventions	18	7.3
<b>PCR result of the infant</b>		
Negative	247	99.6
Positive	1	0.4

During the study period, 248 files of pregnant and breastfeeding mothers with a median age band of 30-34 ,receiving services at Bomu Hospital were abstracted. Of them, 222 PMTCT clients (89.5%) were married and 26 (10.5%) were separated. A total of 161 PMTCT clients were virally suppressed, 17 of them (6.9%) were not virally suppressed and 70 of the clients did not have a baseline viral load done (28.2%). From the table above, a total of 178 clients had viral load results with a suppression rate of 90% (161/178). Almost all the infants were breastfed, and nearly half of the clients' partners were HIV positive.

Of the 248 mothers who were recruited for the study, 230 received a combination of all four psychosocial interventions and 18 of them did not. The most missed out intervention in the group of 18 was the support group.

Out of the 248 charts extracted, a total of 230 (92.7%) PMTCT clients received combined psychosocial interventions; of whom all their infants were PCR negative. On the other hand, 18 (7.3%) clients did not receive the complete combined psychosocial interventions; of whom 1 infant was PCR positive. Of the 18 mothers who did not receive the combined interventions, 7 received 2 interventions (this included the mother whose child turned positive) and 11 mothers received 3 interventions (missing out on the support group session).

All 248 HEI had a PCR test, and only one infant had a HIV positive result at enrollment. The HIV positive client (mother of the HIV positive infant) was enrolled in the program as a newly identified HIV positive client when she attended the Maternal, Newborn Child Health MNCH clinic postnatally. The client missed out on the various ANC supportive interventions that are in place at the PMTCT program at Bomu Hospital, including the ANC support group and the PMTCT delivery care pack because she did not visit the PMTCT clinic.

An audit report for the PCR-positive infant was documented, which highlighted the mother was enrolled in the PMTCT program and initiated on ART after delivery of the infant. The first PCR of the infant was conducted at 5 months of age, and was HIV positive.

## Discussion and Lessons Learnt

The above study provides insights into how combined psychosocial interventions aid in the EMTCT of HIV. In a country where the MTCT rate is at 11%, Bomu hospital has managed to achieve less than 1% MTCT with a few additional innovative practices. This highlights the importance of having mentor mothers, who offer structured treatment literacy such as U=U and PHDP, along with tailormade psychosocial interventions in addition to ART for the elimination of MTCT of HIV.

Since PEPFAR is a funding source for HIV prevention, care, and treatment activities across most sub-Saharan African countries, it is quite possible to work with the resources available to implement the above approaches to aid in client retention and viral suppression hence leading to EMTCT of HIV.

Anecdotal discussions with the mothers showed that mother's reasons for not attending the support groups were lack of time to sit through the support group, which may be between one to two hours long, and possible stigma as the mothers were not sure they wanted to be identified as a client in the PMTCT clinic.

It may be useful for Bomu hospital to explore factors that may cause death in infants or defaulting of treatment for PMTCT clients. Similar studies conducted in different settings/countries may aid in covering the gap identified above as this represented a small population. Furthermore, programs may come up with different combined approaches tailored to their clientele and study how the outcomes may affect the PMTCT cascade. Another area for consideration would be the need of additional biomedical interventions including PrEP for mothers, vaccines, and passive immuno-prophylaxis to reduce the MTCT of HIV (Chi *et al.*, 2020, Van de Perre *et al.*, 2021). While EMTCT remains a challenge in most of Sub-Saharan Africa, very few countries have programs/interventions to work towards achieving the goal set by UNAIDS in the Global plan for achieving EMTCT (UNAIDS, 2021a).

While HIV programs have changed in the 40 years, there is a significant amount of effort that is still required across the various programs to achieve the UNAIDS 2030 goals of ending HIV/AIDS as a public threat by 2030. Addressing the vertical transmission of HIV is crucial to attain the goal and reduce new rates of infection in children and mortality due to HIV in sub-Saharan Africa. PMTCT programs such as the Bomu hospital HIV program may benefit from trying various interventions aligned with other facility programs to achieve the EMTCT of HIV.

## Limitations

Bomu was not able to explore associations between the psychosocial interventions and MTCT, due to the small number of infants who were HIV positive. Additional studies with larger numbers are therefore needed.

## Dissemination Plans

Bomu will share the findings of this research with Bomu staff, County leadership and MOH teams, and stakeholders during a stakeholders meeting. Bomu plans to put up the report on the Bomu website and intends to submit this article to a journal/international conference after approval from CDC Kenya.

## Budget

<b>Meeting MOH/Stakeholders Dissemination of Results</b>	<b>with for</b>	<b>Days</b>	<b>Participants</b>	<b>Cost per item (Kshs.)</b>	<b>Total cost (Kshs.)</b>	<b>Grand Total (Kshs.)</b>
Conference Package.		1	60	3,500	210,000	
Travel Reimbursement		1	50	2,500	125,000	335,000
<b>Physical Report for Dissemination</b>			<b>Copies</b>	<b>Cost per item (Kshs.)</b>	<b>Total cost (Kshs.)</b>	
Printing Booklets			100	2,000	200,000	200,000



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## Appendix

### Patient Informed Consent Form

#### CONSENT FORM

#### Impact of Psychosocial Interventions on Mother to Child Transmission of HIV in Mombasa

Please **initial** box

1. I confirm that I have read and understand the information sheet 16May2022 V1.0 for the above study. I have had the opportunity to consider the information, ask questions and have had these questions answered satisfactorily.
2. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason and without my medical care and/or legal rights being affected.
3. I give permission for the research team to access my medical records for the purposes of this research study.
4. I understand that relevant sections of my medical notes and data collected during the study may be looked at by individuals from the University of Edinburgh, from regulatory authorities or from the partnering organisation/institution where it is relevant to my taking part in this research. I give permission for these individuals to have access to my data and/or medical records.
5. I understand that data collected about me during the study may be converted to de-identified data.
6. I agree to take part in the above study.

Name of Person Giving Consent  
(Participant)

Date

Signature/Thumb impression\*

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Name of Person Receiving Consent

Date

Signature

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*\*Thumb impression to be used if participant is illiterate*

**Name of Witness:**

Signed by impartial literate third party witness (*In case of illiterate and/or mentally disabled participants/use of verbal consent/ if desired by participant/ Legally Authorized Representative is illiterate*)

Signature:

Date:

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Place:

---

**Curriculum Vitae**



CV - Dr. Nashina  
Mohamed - Program



CV - Dr. Aabid  
Ahmed - Principal In

**Good Clinical Practice Certificate**



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**Conflict of Interest Statement**

The authors disclose and confirm that they have no conflict of interest in the publication of this report.