Implementation Evaluation of PMTCT Option B+ in South Africa, 2018:

A mixed-methods, multi-level evaluation of health care provision and user experiences

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The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the funding agencies.

CONFLICTS OF INTEREST

None

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ABBREVIATIONS AND ACRONYMS

AIDS	Acquired Immunodeficiency Syndrome
ANC	Antenatal Care
ART	Antiretroviral Therapy
ARV	Antiretroviral (drug)
cART	Combine Antiretroviral Therapy
CD4	Cluster of Differentiation 4
CDC	Centers for Disease Control and Prevention (South Africa)
CI	Confidence Intervals
CHW	Community Health Workers
DBS	Dried Blood Spot
DC	Data Collector
DHIS	District Health Information System
DHS	Demographic and Health Survey
DIMART	Doctor-initiated management of antiretrovirals
EBF	Exclusive Breastfeeding
EC	Eastern Cape
FDC	Fixed Dose combination
FGD	Focus group discussion
ELISA	Enzyme-linked Immunosorbent Assay
EMTCT	Eliminating mother to child transmission of HIV
EPI	Expanded Programme on Immunization
FO	Facility Observation
FP	Family Planning
GP	Gauteng
HAART	Highly Active Antiretroviral Therapy
HAST	HIV/ AIDS/ STIs/ TB
HCP	Health Care Provider
HCW	Health care worker
HCT	HIV Counselling and Testing
HIV	Human Immunodeficiency Virus
HSRC	Human Sciences Research Council
HSRU	Health Systems Research Unit of the Medical Research Council
ICSM	Integrated Clinical Services Management
IMCI	Integrated Management of Childhood Illnesses
IUD	Intra-uterine device
KR	Key Respondent
KZN	KwaZulu-Natal
LTFU	Loss to follow up
M&E	Monitoring and Evaluation
MCH	Maternal and Child Health

MDO	Missed Diagnostic Opportunities
MI	Mother Interview
MP	Mpumalanga
MTCT	Mother-to-child transmission (of HIV)
NDoH	National Department of Health
NAM	Negative Adolescent Mother
NHLS	National Health Laboratory Service
NIMART	Nurse-initiated Management of Antiretrovirals
NW	North West
PM	Pregnant Mother
PMTCT	Prevention mother-to-child transmission of HIV
PNC	Postnatal care
PNN	Postnatal Negative Mother
PNP	Postnatal Positive Mother
QC	Quality Control
RFA	Results for Action
RtHB	Road to Health Booklet
SANAC	South African National AIDS Council
SAMRC	South African Medical Research Council
SD	Standard Deviation
SES	Socio-economic Status
SMS	Short Message System
SOP	Standard Operating Procedures
TAC	Treatment Action Campaign
TAT	Turn-around Time
UNICEF	United Nations Children's Fund
UTT	Universal Test and Treat
VL	Viral Load
WHO	World Health Organization

DEFINITIONS

The definitions below are used in this evaluation

Adolescent: In this Evaluation, an adolescent is one aged between 13-19 years

Young adults: In this Evaluation, a young adult is one aged between 20-24 years

Adult/older: In this Evaluation, an adult is one aged 25 years and older

EMTCT: Elimination of mother to child transmission of HIV

HIV unexposed uninfected (HUU) child: A child born to an HIV negative mother

HIV-exposed child: A child born to an HIV positive mother

HIV-exposed uninfected child: An HIV exposed child whose HIV tests have been negative between birth and the time of the interview

HIV-free survival: Refers to the proportion or percentage of HIV-exposed children who are uninfected and alive at a particular time point

HIV-positive child: A child who tested HIV PCR positive at < 18 months or whose antibody test was positive at or after 18 months of age

HIV-positive mother: Mother who reports being HIV positive or who is recorded as being HIV positive on the infant's Road to Health Chart

Infant: A child from birth to 12 months of age

Child morbidity: Maternal report of infant diarrhoea, cough, or difficult breathing or fast breathing in the last two weeks, or diarrhoea that lasted for more than 2 weeks since the last interview

Mother-to-child transmission of HIV (MTCT): HIV transmission from an HIV-infected woman during pregnancy, labour, delivery or breastfeeding to her child. The term is used because the mother is the direct source of HIV infection. No maternal blame is intended

Universal test and treat (UTT): Universal testing and making ART available to all HIV-infected persons regardless of CD4 count

EXECUTIVE SUMMARY

INTRODUCTION

In resource-limited settings with high HIV prevalences, such as South Africa, up to 9% of under-five deaths and 35% of maternal deaths are HIV-related. In 2015, South Africa implemented 'Option B+', a 'Universal test and treat Strategy (UTT)' for HIV infected pregnant and lactating women to prevent mother-to-child transmission of HIV (PMTCT), also known as vertical transmission of HIV. This mixed methods, multi-level programme evaluation was undertaken to understand PMTCT Option B+ implementation in South Africa, three years after the policy was changed. We sought to understand implementation from policy-makers', health care providers' and users' perspectives, to identify opportunities for programme strengthening.

In this report we present key qualitative and quantitative findings relating to the following objectives:

1. To explore the views of national, provincial, district, and facility-level managers and implementing partners regarding health system readiness for B+ implementation, and effectiveness of PMTCT Option B+ scale-up.
2. To explore service users (adolescents, young and adult/older women, and men) perceptions of PMTCT Option B+.
3. To investigate health care providers' perspectives of PMTCT programme implementation in the context of maternal and child health (MCH).
4. To document facility readiness for implementing PMTCT Option B+ in the context of other maternal and child health interventions.
5. To document mothers' experiences of maternal and child health care services in the context of PMTCT Option B+.

METHODS

Mixed methods were used. Research activities were conducted at national, provincial, district, health facility and individual levels to assess the views and experiences of policy makers, health care providers and users. The six districts included in the evaluation were: OR Tambo in Eastern Cape (EC); Ekurhuleni in Gauteng (GP); eThekwini in KwaZulu-Natal (KZN); Greater Sekhukhune in Limpopo (LP); Ehlanzeni in Mpumalanga (MP) and Bojanala in North West (NW), selected from 25 districts that had the highest number of polymerase chain reaction (PCR) positive infants in 2014 and 2015.

Activities were conducted as follows:

Views of national, provincial, district and facility-level managers and implementing partners regarding health system readiness for B+ implementation, and effectiveness of PMTCT Option B+ scale-up: Individual in-depth interviews (IDIs) were conducted with key national- provincial- and facility-level managers, and implementing partners working with the PMTCT program to gather data on PMTCT Option B+ policy and implementation. Additionally, IDIs were conducted

to explore district managers and specialists' experiences of PMTCT Option B+ initiation, scale-up and retention in care. At the facility level, 12 facilities were purposively selected for in-depth case studies. At these facilities, facility manager interviews were conducted to gather data on models of care used to implement PMTCT Option B+ (including integration between services).

Service user (adult mothers, young mothers, men) perceptions of PMTCT Option B+: Focus group discussions were conducted with pregnant and postpartum women including adolescents and men for in-depth exploration of their (and their partner's, in the case of men) PMTCT Option B+ experiences.

Health care provider perspectives of PMTCT programme implementation in the context of maternal and child health: Health care providers answered a self-administered questionnaire to document knowledge of and adherence to the PMTCT Option B+ protocol. Additionally, facility-level face-to-face in-depth case studies were conducted in selected facilities.

Facility readiness for implementing PMTCT Option B+ in the context of other maternal and child health interventions: Facility managers (1 per facility) were interviewed to obtain information on the equipment and supplies available for PMTCT Option B+ initiation, scale-up, and maintenance.

Mothers' experiences of maternal and child health care in the context of PMTCT Option B+: HIV positive and HIV negative mothers with children aged 4-14 weeks or 6-12 months were interviewed to ascertain their knowledge of and experiences with PMTCT services.

DATA ANALYSIS

An inductive approach was used for qualitative data analysis. In depth review of the interview and focus group discussion data was conducted by 2 South African Medical Research Council (SAMRC) researchers who then coded all IDIs and focus group discussions (FGDs) independently and met weekly basis to discuss their findings. They also consulted a mentor for assistance with data interpretation. Meetings were held to discuss emerging themes, clarify disagreements, decide on uncertainties and conceptualise themes into meaningful data. Finally, findings were presented to the study PIs and B+ research team and their input was taken into consideration during the report writing. Quantitative data were weighted for sample ascertainment and adjusted for clustering. Descriptive statistics are presented as proportions per district (facility observation (FO) and health care provider (HCP) results) and per stratum within each district (mother interview (MI) results), in respect of the weighted survey design. Data analyses were carried out in STATA version SE-14 (College Park, Texas).

RESULTS

Results are ***presented by each objective***, and ***framed within key global goals, as appropriate***, namely with the ***four PMTCT prongs*** (i) keeping women HIV negative, (ii) preventing unintended pregnancies, (iii) preventing vertical transmission of HIV, and (iv) linking mothers, and their families to HIV-related care; the ***three process indicators to validate the elimination of vertical transmission of HIV, and the 90-90-90 targets*** (i) antenatal coverage amongst all pregnant women, (ii) HIV testing coverage amongst all women, and (iii) triple antiretroviral therapy (ART) coverage amongst HIV positive women, and (iv) viral load (VL) suppression.

Views of national, provincial, and facility-level managers and implementing partners regarding health system readiness for B+ implementation, and effectiveness of PMTCT Option B+ scale-up:

Data were collected between 6th February 2018 and 26th March 2019. Forty-six interviews were conducted (2 national managers, 8 provincial managers, 13 district managers, 11 implementing partners and 12 facility managers).

Results from national and provincial level interviews:

- Mixed views were expressed on health systems readiness for Option B+ implementation. Some interviewees felt the overall health system was not ready for implementation and national scale-up. Further, some felt the period between policy launch and the expected date to implementation was too short and inadequate to properly plan systems and logistics for smooth implementation.
- However, others felt the country was ready to implement Option B+. Their view was that Option B+ activities were well planned with focused efforts which involved collaboration of various stakeholders to ensure optimal readiness.

Results from district level interviews

- Overall, there was buy-in and willingness to implement the Option B+ policy at district and facility level. However, some respondents felt the anticipated increase in the number of antenatal clients initiated on ART at the initial stages, would create additional workload on the already overstretched health care workers (HCWs).
- The key respondents (KR) felt that supervisory support site visits, monthly and quarterly review, stock-take meetings and dashboard reports were all effective strategies to improve policy implementation at different levels.

Results from facility level interviews

- Efforts were being made to integrate services e.g. providing a one-stop shop for mother-baby pairs, MCH and family planning (FP), in order to ensure good retention in care.
- Laboratory related innovations were deemed to be critical in closing missed diagnostic opportunities (MDOs), shortening turn-around-times (TAT) and in facilitating tracking of clients lost to follow-up (LTFU). Managers identified the Results for Action (RFA) reports which is a data driven strategy to improve linkage to care and the provision of printers at each facility were crucial for effective program implementation.
- Data and information systems were developed, which include the tick register and migration to web-based District Health Information System (DHIS). The web-based laboratory systems enabled facilities to access lab results quickly, whilst lab-unique patient identifiers eliminated duplication and wasteful expenditure. No routine longitudinal systems were available for monitoring of mother-baby pairs.

Focus group discussions with service user (adult mothers, young mothers, men) perceptions of PMTCT Option B+:

Focus group discussions were conducted between 19th April 2018 and 14th May 2018 and between the 6th and 13th November 2018. Nineteen FGDs were conducted: four with HIV positive older (aged ≥25 years) mothers (in OR Tambo, Ekurhuleni, eThekwini and Ehlanzeni districts); six with pregnant women regardless of HIV status and age (one per district); two with men (eThekwini and Ehlanzeni districts); six with HIV negative older mothers (one per district) and one with HIV negative adolescent (age 13-19 years) mothers (eThekwini district).

- Mothers enrolled in the PMTCT program knew the importance of adhering to treatment and having a suppressed viral load. HIV positive mothers reported that their health improved since ART initiation, few reported side effects that lasted a day and up to a month but did not make them discontinue treatment.
- HIV negative pregnant and post-natal women also reported that they do not receive pre-test counselling, but they receive counseling advising them to refer their partners for testing and that they should receive HIV testing 3-monthly during pregnancy and after delivery. They do not receive counselling on how to remain HIV negative.
- HIV positive women receive post-test counselling on partner testing, treatment adherence, use of condoms and how to remain virally suppressed.
- Most of the HIV positive women reported that they received support from their male partners and family members to whom they disclosed their status.
- The majority of male partners interviewed reported inconsistent use of condoms and reluctance to go for HIV testing.

PMTCT programme implementation in the context of maternal and child health, from a health care provider perspective:

Eight hundred and seventy-six (876) health care providers (HCPs) completed self-administered questionnaires (373 professional nurses, 206 lay counsellors, 54 staff nurses, 62 auxiliary nurses, 6 doctors and 175 'other' (Community Health Workers and mentor mothers) across six districts). The district breakdown of the 876 interviews was as follows; OR Tambo (148), Ekurhuleni (145), eThekwini (94), Greater Sekhukhune (195), Ehlanzeni (127), and Bojanala (167).

- Across all six districts, about a third of respondents did not have access to the 2015 PMTCT guidelines, and less than 60% had been trained on them at the time of data collection (2018).
- Across all six districts, less than 70% of healthcare providers had optimal (>80%) knowledge of PMTCT practices.

Facility readiness for implementing PMTCT Option B+ in the context of other maternal and child health interventions:

Data were collected from between 24-28 facilities per district.

- In Bojanala district, more than a quarter of the facilities did not have the 2015 PMTCT Guideline and the National Contraception and Fertility Planning Policy and Service Delivery Guidelines.
- Although the National DoH has rationalized registers into one Primary Healthcare (PHC) tick register, when the policy was introduced new data elements were not included on time.
- Over half, 52.0% and 60.7% facilities in Ekurhuleni and Bojanala, respectively, had a low supply of Benzathine penicillin, a recommended treatment of syphilis is children and pregnant women. Ehlanzeni had the lowest percentage of facilities with cotrimoxazole tablets (68.0%), whilst OR Tambo had the lowest for nevirapine tablets (16.7%).
- Some facilities reported that there were not enough 'easy to follow' job aids that frontline workers could easily refer to, which they reported led to inconsistencies and poor adherence to the policy guidelines.
- Staff shortages and high staff turn-over were reported, which participants reported resulted in reliance on inexperienced community-service clinicians and retired nurses. No needs assessment was done prior to the policy change, to establish additional human resources needed to meet increasing demands for HIV counselling and testing and ART initiation. Further, the policy was implemented before adequate training coverage in some facilities.

Mothers' experiences of maternal and child health care in the context of PMTCT Option B+:

Two-thousand and seventy-two (2072) mother-baby pairs were included in this component of the evaluation: 398 mothers living with HIV with infants aged 4-14 weeks; 523 HIV negative mothers with infants aged 4-14 weeks; 455 mothers living with HIV with infants aged 6-12 months, and 696 HIV negative mothers with infants aged 6-12 months were interviewed. The total sample realisation by district was: 321 in OR Tambo; 273 in Ekurhuleni; 385 in eThekwini; 399 in Greater Sekhukhune; 355 in Ehlanzeni and 339 in Bojanala.

- The proportion of mothers with infants in the 4-14-week strata and 6-12 months, who self-reported immediate ART initiation was less than 77% across all six districts.
- According to mothers self-reported data, stockouts of drugs and test kits and tubes were a major concern). Similarly, staff shortages were reported to be a major problem across all six districts.
- The majority of women complained about partners not supporting them financially and physically. Their partners would not accompany them during ANC and postnatal period, do not want to be tested for HIV, and often refuse using condom use. Lack of male involvement remains a challenge that undermines efforts to strengthen family-oriented care (i.e. extending health screening and assessment services to all family members in support of EMTCT).

- The proportion of mothers with unplanned pregnancies across all districts was high, especially in OR Tambo and Ethekwini districts were the proportions were greater than 60%.
- There was high maternal knowledge (>80%) of 3-monthly retesting but low proportions being retested (<65% and <75% in the 4-14 week and 6-12-month strata respectively).
- There was discordance between maternal self-report of ART treatment and recording of maternal ART in the Road to Health Book (RtHB), for example in Bojanala district 98.4% of mothers in the 4-14 week postpartum group and 97.3% in the 6-12 month postpartum group reported that they were on ART but only 65.5% and 63.1% had this recorded in the RtHB, respectively.
- Birth testing of infants in both the 4-14 week and 6-12-month strata was >70% in all districts except Greater Sekhukhune and Bojanala, but still far short of reaching the 90-90-90 targets
- Intention to breastfeed at birth ranged from 54-88% and 69-85% amongst WLHIV and HIV negative women respectively with infants aged 4-14 weeks and 59-83%, and 58-79% amongst WLHIV and HIV negative women, respectively with infants aged 6-12 months. The percentage of infant who were reportedly exclusively breastfed (maternal self-report) during the 8 days prior to the interview was much lower: 27-49% and 23-42% amongst WLHIV and HIV negative women respectively with infants aged 4-14 weeks and 52-9%, and 1-6% amongst WLHIV and HIV negative women, respectively with infants aged 6-12 months.

LIMITATIONS

This evaluation was limited to an in-depth evaluation of six districts of South Africa. Thus, the results are not nationally representative. Since facilities and providers began Option B+ in 2015, recall bias may affect data quality. Unintended, unplanned pregnancy was measured from single questions based on self-report, rather than using a validated measure or measuring pick-up of contraceptive pills. Additionally, data on process indicators collected in this evaluation are drawn from cross-sectional observations rather than a cohort and do not reflect facility transfers, deaths and poor retention in care. Women who had stillbirths or whose baby died less than 4 weeks were excluded from the sample, this could underestimate measurement of some process indicators. Some analyses based on routine data were limited by the quality of the available routine data. The evaluation focused on processes of PMTCT Option B+ implementation with the aim to strengthen successes and identify PMTCT gaps. There were no interventions tested and this evaluation did` not measure the impact of PMTCT Option B+.

CONCLUSIONS

Whilst PMTCT Option B+ is an innovative policy, the bottle necks associated with its implementation are many. For a new policy, lessons learned are that;

- Stakeholder consultation and involvement is crucial prior implementation of new policies and enough time should be given for planning and organization of resources needed for implementation.
- A needs assessment should be conducted prior to introduction of a new policy in order to establish additional human resources and capacitation needed to meet increasing demands for HIV counselling and testing and ART initiation.

- Male involvement remains a challenge. Improvement of male access to education promoting HIV testing and other prevention strategies is important. Use of technology like Mom-connect could be useful in educating men and improving male involvement.
- Standardized systems for recording and monitoring for viral load tests done are needed for improving patient management. Point-of-Care (POC) technologies could be useful for services integration, and complementing laboratory-based platforms in support of Infant Virologic Testing and VL testing in pregnant and breastfeeding women.
- Providers did not have sufficient access to guidelines and only two thirds were trained on implementation of PMTCT Option B+. Broader dissemination of guidelines is needed and paired with increased training and buy in for improved implementation.
- New policies should be well aligned with the M& E tools and human resource skills needed.
- Strengthening effective communication about new policies for all stakeholders is very important.

1.0 INTRODUCTION

1.1 BACKGROUND

Globally, between 2012 and 2015, HIV treatment shifted from a "targeted" or "selective" approach, to a " treat all" approach for all HIV infected adults and children [1]. The 2010 introduction of universal antiretroviral treatment (ART) for all HIV positive pregnant and lactating mothers [2] gained support, and by 2016, all 22 Global Plan priority countries (countries with over 90% of the world's pregnant HIV positive population) had either endorsed, implemented, or conducted national scale-up of PMTCT Option B+ [3]. The WHO included Option B+ and Treat All in its guidelines in 2013 and 2016, respectively. Option B+ provides life-long maternal triple ART (cART/ART) regardless of maternal CD4 cell count and staging. This approach has reduced MTCT to under 2% in non-breastfeeding countries [4].
In 2012, global guidelines were introduced for monitoring the national-level impact of PMTCT programmes [5]. Methods included mathematical modelling, immunization-based clinic surveys, household surveys, demographic site surveillance, early infant diagnosis (EID) data, cohort data, case reporting, and triangulation of existing data [5]. Since 2010, several countries including Namibia, South Africa, Mozambique, Rwanda, Zimbabwe, and Zambia have studied the national impact of PMTCT programmes.

In resource-limited, high HIV prevalence settings such as South Africa, up to 9% of under-five deaths and 35% of maternal deaths are HIV-related, necessitating critical study of HIV prevention and PMTCT impact [6, 7]. South Africa is one of the 22 global plan priority countries [8]. Between 2001 and 2015, the South African national PMTCT policy underwent several revisions. Antiretroviral interventions recommended by the South African National PMTCT programme expanded from single dose nevirapine (2001) to dual therapy (February 2008), followed by World Health Organization's (WHO) Option A (April 2010) and then lifelong fixed-dose combination triple ART for all HIV-positive pregnant women (January 2015) [9, 10].

Data from the South African PMTCT evaluations conducted in 2010, 2011 and 2012-13 demonstrated a reduction in early (4-8 week) mother-to-child transmission of HIV (MTCT), from 3.5% (95% confidence interval 2.9-4.1%) in 2010 to 2.7% (2.1-3.2%) in 2011-12 and 2.6% (2.0-3.2%) in 2012-13 [11-13]. The latter findings were measured under PMTCT Option A policy. By 2018, routine data measured a 0.9% MTCT rate at 10 weeks postpartum; however, coverage of 10-week testing was low (approximately 50%) [14]. There are no population-level South African data on the impact of PMTCT Option B or B+ policy on MTCT, maternal and infant health-related practices and survival. This process evaluation was conducted approximately three years after PMTCT Option B+ was adopted as national policy in SA, to gather information on implementation experience and bottlenecks to guide programme improvement.

1.2 AIMS AND OBJECTIVES

Overall aim: This evaluation aimed to understand PMTCT Option B+ implementation; to identify focused solutions to remove key bottlenecks in the implementation of 'test and treat for pregnant and lactating women' and their families.

In this report we present key findings for the following objectives:

1. To explore the views of national, provincial, district and facility-level managers and implementing partners regarding health system readiness for B+ implementation, and effectiveness of PMTCT Option B+ scale-up.
2. To explore service user (adult mothers, young mothers, men) perceptions of PMTCT Option B+.
3. To investigate PMTCT programme implementation in the context of maternal and child health, from a health care provider perspective.
4. To document facility readiness for implementing PMTCT Option B+ in the context of other maternal and child health interventions.
5. To document mothers' experiences of maternal and child health care in the context of PMTCT Option B+.

This Evaluation worked with existing district partners and reports to identify current gaps in the PMTCT programme. The Theory of Change Logic Model for Identifying Key Interventions is provided in Appendix 1.

2.0 PROCEDURES/METHODS

2.1 DESIGN

A mixed methods multi-level process evaluation with multiple activities was conducted. Qualitative and quantitative methods were used to enable triangulation of information from various perspectives, allowing an in-depth evaluation of the implementation and early effectiveness of PMTCT Option B+. The activities occurred at the national district and the facility levels where health workers and service users were interviewed to provide multi-level data.

2.2 SETTING

The evaluation was conducted in six purposively-selected districts (OR Tambo in EC; Ekurhuleni in GP; eThekwini in KZN; Greater Sekhukhune in LP; Ehlanzeni in MP and Bojanala in NW), selected from 27 districts that had the highest number of polymerase chain reaction (PCR) positive infants in 2014 and 2015. The selection includes a mixture of metropolitan, rural, and semi urban districts.

2.3 QUALITATIVE COMPONENT: REPORT OBJECTIVES 1 AND 2

2.3.1 SAMPLING

Views and experiences of national and provincial managers regarding health system readiness for B+ implementation, and effectiveness of PMTCT Option B+ scale-up: Twenty-six national and provincial level policy makers and implementing partners were identified for inclusion in individual in-depth interviews. National policy-makers targeted for inclusion included PMTCT coordinators; Child Health Specialists; Maternal health chief directors; HIV/AIDS Chief Directors). Provincial level interviewees included nine provincial programme managers. Implementing partners were identified by the NDoH and by the Centers for Disease Control, South Africa and had to be assisting with PMTCT implementation at provincial and district levels. Sampled partners included: (i) Right to Care, (ii) Treatment Action Campaign, (iii) South African National AIDS Council (SANAC), (iv) University of Pretoria (v) AURUM Institute, (vi) Health Systems Trust, (vii) Wits Reproductive Health and HIV Institute, (viii) University of Cape Town (ix) mothers2mothers and (x) BroadReach, (xi) Positive Women's Network, (xii) Kheth'Impilo, and (xiii) Foundation for Professional Development. We conducted telephonic/skype/face-to-face in-depth interviews with selected participants (Table 1).

Formative assessment evaluating the implementation and effect of PMTCT Option B+ at district-level: District-level interviewees were purposively identified. We interviewed two people per district selecting either a district health manager/primary health care (PHC)

manager and a district specialist /district PMTCT coordinator. Tools for this assessment can be found in Appendix 3.

Formative assessment on how selected facilities have implemented PMTCT Option B+, within their maternal and child health framework: One in-depth case study was conducted in each of twelve purposively selected facilities (two facilities per district). Facilities were selected based on high PCR positivity and high immunization uptake. Tools for this assessment can be found in Appendix 3.

User perceptions regarding the test and treat strategy: Focus group discussions (FGDs) were conducted with pregnant and postpartum adult women (age ≥25 years), adolescents (age 13-19 years) and adult men (age ≥25 years) for in-depth exploration of their PMTCT Option B+ experiences. Six groups of people were targeted for inclusion in the FGD. Characteristics for selection are included below (Table 2). Tools for this assessment can be found in Appendix 3.

Table 1: Targeted sample size and interview method in the qualitative component for PMTCT Option B+ Evaluation in South Africa 2018

Level	Targeted sampled size	Interview method
National and Provincial	28 In-depth interviews with national policy makers, provincial programme managers, and implementing partners.	Telephonic/skype/face-to-face in-depth interviews
District	18 In-depth interviews with District Managers/PHC Managers, District PMTCT Coordinators/District Specialists.	Telephonic/skype/face-to-face in-depth interviews
Facility-level case studies	12 In-depth case-studies were conducted with either a Health Facility Managers or Facility PMTCT Managers or Maternal and Child Health Manager	Face-to-face in-depth case study interviews
Focus group discussion: users/clients	Targeted up to 36 FGDs with 6 groups of service users	Focus Group Discussions

PMTCT-Prevention of Mother-to-Child Transmission of HIV; PHC – Primary Health Care; FGD-Focus Group Discussions

Table 2: Characteristics of participants targeted for inclusion in the focus group discussions for PMTCT Option B+ Evaluation in South Africa 2018

Characteristic	**Group 1** HIV positive adult/older mothers	**Group 2** HIV positive adolescent mothers	**Group 3** Pregnant women regardless of HIV status and age	**Group 4** Men	**Group 5** HIV negative adult/older mothers	**Group 6** HIV negative adolescent mothers
Female	√	√	√		√	√
Men				√		
HIV positive	√	√	√			
HIV negative			√		√	√
Mother pregnant			√			
Mother's age						
<20 years		√	√			√
20-24 years,			√			
25-29 years	√		√		√	
30-34 years	√		√		√	
>35 years	√		√		√	
Mother and baby 0-6 months	√	√			√	√
Father with baby 0-6 months				√		
Lived in district for > 6 months	√	√	√	√	√	√

Adolescent: 13-19 years; Adult/older: 25 years and older. All groups (except for the group of pregnant women) included babies aged 0-6 months and should have lived in the district for >6 months.

2.3.2 QUALITATIVE DATA COLLECTION, MANAGEMENT, AND ANALYSIS

An inductive approach was used during this evaluation, to allow for the exploration and generation of new ideas, as the 'UTT' / the PMTCT Option B+ approach has been implemented for less than five years globally, and only one year in South Africa [15]. In-depth interviews (IDIs) and focus group discussions (FGDs) were recorded and transcribed in English using Microsoft Word. After transcription 2 SAMRC qualitative researchers read through all texts to become familiar with the data. A third qualitative research mentor/coach also read through a series (about 10 IDIs and 10 FGDs) of transcripts to familiarise herself with data. A half day meeting was held to discuss and agree on common themes emerging from the data. The mentor sampled 10 out of 46 IDIs and 6 out of 19 FGDs to code them independently using a thematic framework analysis. The 2 SAMRC researchers also read the same transcripts that were sampled by the mentor to gain in-depth understanding of the context for each IDI or FGD while assigning codes independently using a thematic framework analysis.

Thematic framework analysis is an interpretive process that is often used to identify patterns from the data systematically [14]. It is a suitable analysis method for qualitative policy evaluation research. The 2 SAMRC researchers coded all IDIs and FGDs independently and met on a weekly basis to discuss their findings. Direct quotes were presented to support researchers' conclusions. For transparency and reliability, findings were presented to the study PIs and B+ research team using thematic analysis excel spreadsheet and their input was taken into consideration during the report writing.

2.4 QUANTITATIVE COMPONENT: REPORT OBJECTIVES 3-5

2.4.1 SAMPLING, INCLUSION AND EXCLUSION CRITERIA

A probability proportional to size sampling frame was used to randomly select 24 facilities in each of the purposively selected districts to ensure representativeness in each district. The target sample size, inclusion and exclusion criteria for report objectives 3-5 are shown in Table 3 below.

Table 3: Evaluation population, inclusion, exclusion criteria and tools for PMTCT Option B+ Evaluation in South Africa 2018

Objective	Target respondent	Targeted sample size	Inclusion criteria	Exclusion criteria	Tools
PMTCT programme implementation from a health care provider perspective	Health care providers	120 health care providers and 120 lay counsellors / community health worker interviews per district. (10 staff members (five health care providers and five lay counsellors) per facility). Sample size calculated to provide valid estimates of four main indicators at district level: (i) ART initiated immediately without waiting for blood results (ii) HIV negative mother re-tested at birth and 3 monthly (iii) HIV exposed infants tested at birth for HIV infection (iv) Exclusive breastfeeding supported amongst HIV negative and HIV positive women.	Facility based staff members Working in antenatal care or child health care i.e. integrated management of childhood illnesses (IMCI) or early infant diagnosis (EID) or immunisation (EPI) or PMTCT or antiretroviral (ARV) administration Working within the South African health care system for at least one year Working within the selected facility for at least six months.	Participants: who did not speak one of the 11 South African native languages Did not have time to attend the interview Had less than six months experience within the South African PHC system Worked in the selected facility for less than six months Attending to an emergency	Paper based self-administered questionnaire uploaded on REDCap mobile application
Health facility readiness for PMTCT Option B+ implementation	Facility managers	One review in each facility	One facility checklist for each facility from which mothers and health care providers were enrolled	Participant does not speak one of the 11 South African native languages	Interviewer-administered facility checklist captured directly on REDCap mobile application
Mother's experiences of care in the context of PMTCT Option B+	Mothers	480 mothers per district: 120 per postpartum category: • HIV positive 4-14 weeks • HIV negative 4-14 weeks • HIV positive 6-12 months • HIV negative 6-12 months Sample size calculated to provide valid estimates of four main indicators at district level: (i) ART initiated immediately without waiting for blood results (ii) HIV negative mother re-tested at birth and 3 monthly (iii) HIV exposed infants tested at birth for HIV infection (iv) Exclusive breastfeeding supported amongst HIV negative and HIV positive women	Women who were 4-14 weeks/6-12 months postpartum Participant has gone through antenatal care and delivery in a South African health facility Participant has been attending the selected facility for at least six months, for maternity or non-maternity reasons.	Did not obtain antenatal care or deliver in a South African facility Participants under the age of 13 years	Paper based interviewer-administered interview questionnaire Electronic interviewer-administered questionnaire on REDCap mobile application

2.4.2 QUESTIONAIRE CONTENT

Some of the indicators collected from mothers include i) knowledge and experience of maternal and child health programmes in the clinic (ii) maternal pregnancy intention (planned / unplanned) (iii) maternal use of child health care services (iv) maternal contraceptive use (v) maternal HIV testing – assessed by self-report using a question that asked if mothers had ever been tested prior to their last pregnancy (vi) HIV treatment and adherence (vii) infant feeding and medication (viii) mobile technology . Some of the indicators collected from HCP include i) staff with knowledge of each PMTCT step ii) proportion of staff with <80% knowledge of PMTCT protocol iii) adherence to each step in the PMTCT protocol iv) proportion of facilities that offer viral load testing as per PMTCT guidance v) facilities with the necessary guidelines vi) turnaround time for results to reach clinics. Some of the indicators collected from the facility observation checklist include i) effect of PMTCT Option B+ on clinic functioning e.g. workload, waiting times etc. ii) facility retention rate at 6 and 12 months iii) burn-out amongst health care providers. Tools for this assessment can be found in Appendix 3.

2.4.3 TRAINING

Data collectors, team leaders and supervisors received training in accordance with the evaluation protocol and standard operating procedures (SOP). SOPs can be found in Appendix 4. Training included: interviewing techniques, selection of participants, obtaining informed consent, how to use the electronic data collection instrument, questionnaire interpretation and interviewing in local languages. Training included practical session of different scenarios that may arise in the field.

2.4.4 DATA COLLECTION

Data Collection commenced on the 6 February 2018 and ended on the 26 March 2018 in all six districts. Due to inadequate sample size attainment on mother interviews, we had to revisit some facilities to mop-up. The mop-up phase commenced on the 21 May 2018 to the 15 June 2018 in four of the six districts namely Ehlanzeni, Greater Sekhukhune, OR Tambo and Bojanala, and was guided by funding availability and attained versus target sample size. After collecting all completed questionnaires and consent forms from HCPs, the questionnaires were uploaded onto REDCap system and transmitted to the server. REDCap is a secure web application that is hosted and backed up utilizing SAMRC IT infrastructure. The hard copy consent forms were submitted to the evaluation coordinators for review and stored in an access controlled filing cabinet.

Hard copies were stored securely in lockable cabinets at the MRC head office in Cape Town and will be maintained for a period of five years. No personally identifiable information was contained in the hard copies. After five years hard copies will be destroyed. Only the Principal Investigator, Data Manager, and Project Manager have access to the secured lockable cabinets and the web-based password protected interface (REDCap). Data are stored in a Share Drive within the MRC protected server with authorized access through a password

protection. All staff including those having access to data signed a data use and confidentiality agreement.

2.4.5 ENROLMENT

2.4.5.1 Health Care Provider Interviews

Following written informed consent each HCP (registered nurses, assistant nurses and lay staff) were asked to complete a self-administered questionnaire. A data collector oversaw the process in each facility to ensure that HCPs did not share responses or source answers elsewhere. On-site quality checks were conducted by the data collector to ensure questionnaire completeness and legibility. Data collectors uploaded questionnaires onto the REDCap mobile application on the interview day.

2.4.5.2 Facility readiness for implementing PMTCT Option B+ in the context of other maternal and child health interventions*:* Facility Observation Checklist

An interviewer-administered questionnaire was conducted with a facility manager or his/her designee in each facility. This was a quantitative cross-sectional observational assessment of equipment and supplies for PMTCT Option B+ and MCH service implementation. This tool was completed based on information verified by the data collector.

2.4.5.3 Mother Interviews (MI)

Quantitative cross-sectional interviews were conducted with mothers visiting the sampled facilities for maternal and child health care services. These mothers were screened for eligibility using the screening criteria. Eligible mothers were systematically selected including mop-up phase. A consent process was followed, and data collectors conducted interviews with eligible mothers after consent in an allocated area for privacy.

2.4.6 QUALITY CONTROL AND FIELDWORK MONITORING

Quality control (QC) was maintained by adhering and monitoring adherence to SOPs (e.g. how to conduct interviews, obtaining informed consent, recording data, reporting data etc.). Data collectors were trained over five days using a standardized manual and operating procedure. Training included practical sessions on how to gather data and use of tablets for electronic data capturing. QC activities aimed to improve the quality and validity of the collected data by:

- Identifying factors that may affect the accuracy and reliability of the data and addressing the identified factors;
- Preventing and correcting errors in the collection of data; and
- Ensuring that field activities align with the evaluation SOPs.

2.4.7 SAMPLE, SAMPLING, POST-SURVEY ADJUSTMENT AND ANALYSIS

The sample sizes needed for maternal data guided the primary design of the evaluation. The sample size calculations were performed taking into consideration the feasibility of acquiring district-level data as observed in our previous national PMTCT cross-sectional surveys (carried out in 2010-2013) and to provide estimates of four key indicators that reflect critical activities along the PMTCT cascade (See Table 3). The PMTCT cascade is a series of key stepwise activities that constitute a critical pathway to successful PMTCT that begins with all pregnant women and ends with the detection of a final HIV status in HIV-exposed infants [16].

Thus, the sample size was calculated to ensure an absolute precision of 10% or less for each of the four indicators with a design effect of 2. In order to broadly represent PMTCT program impact on MCH, mothers of younger and older infants as well as mothers of HIV-exposed and HIV un-exposed infants were included. Therefore, four strata were defined for the evaluation; two groups of younger infants (4-14 weeks old) with HIV-positive or HIV-negative mothers and two groups of older infants (6-12 months old) with HIV-positive or HIV-negative mothers. After considering the lowest samples sizes needed by each of the four data elements with the defined precision and design effect, a sample size of 120 was sufficient for each stratum in a single district. This design ensured a self-weighting sample at the stratum and district level.

Participants were enrolled at facility level and an average of five mother-infant pairs per stratum was deemed feasible to enrol from a single facility offering at least 10 immunizations per month. Thus, an average of 20 participants across all four strata was targeted per facility. In order to achieve the target of 120 for each stratum, 24 facilities were needed per district. A sampling frame consisting of all facilities offering at least 10 immunizations per month from each district was used to randomly select 24 facilities. In the event that the facility was observed to be too remote and inaccessible or had too few eligible patients visiting for immunizations during the 3-month evaluation period, it was replaced by another randomly selected facility. Mothers were randomly selected from waiting rooms, followed by screening to check eligibility and those eligible for any of the four strata were enrolled if they gave consent.

For HCP, at least one HCP per facility, with a maximum of five for larger facilities, was targeted for interviews while only one facility observation (FO) assessment was performed per facility. Thus, a maximum sample of 240 HCP interviews was expected and a maximum of 24 facility observation assessments were expected per district. One facility manager is expected on any day hence we used the random selection of facilities as also representative of facility managers as well as all staff in the case of under-staffed facilities where all staff in each category were invited to participate. It was in only a few facilities where more than the targeted sample was found, in this case any of the available staff were interviewed

2.4.7.1 Descriptive statistical analyses

Data analyses were carried out in STATA version SE-14 (College Park, TX). Descriptive statistics are presented as proportions per district (FO and HCP results) and per strata within each district (MI results). All 95% confidence intervals (CI) were calculated using the logit method through the STATA 'proportion' function. Non-overlapping confidence intervals and p-values <0.05 have been used to infer a likelihood of true differences between observed proportions.

Post-survey weights were calculated. However, wide confidence intervals could be expected for clusters with low sample realization and p-values <0.05 for wide confidence intervals should be interpreted with caution. Adjustment for cluster-effect was performed for the MI and the HCP datasets because the actual number of participants sampled per facility per stratum varied and ranged between 0 and 10. The cluster adjustment for the MI data was done at two levels of sampling strata, i.e., the facility and the stratum level. Cluster adjustment for HCP was done only at facility level, for variation in the number of HCPs interviewed per facility within each district.

No post-survey adjustment was needed for the FO data because each facility was assessed once.

2.4.7.2 Sociodemographic characteristics and Socio-economic status (SES)

The following descriptive characteristics of the mother's sample are presented: maternal and infant age, infant age; maternal education, marital status. Socio-economic status (SES) groupings for the MI data were generated from wealth scores estimated using household conditions, household assets and experiences of household food shortage. Principal component analyses was used to calculate the wealth scores from the following data elements: type of housing material, type of sanitation system, type of household fuel, water source, living in a house with a refrigerator, radio, television and stove, ownership of a cellphone, ownership of a car, ever having to cut down on food and meals and ever having gone without food in the house [17].

The observed distribution of wealth scores had a narrow variation, possibly because the districts included in the evaluation were dominated by middle and lower SES communities in South Africa. The method proposed by Filmer & Pritchett (2001) for samples with low variation in SES was adopted, wherein, fewer SES groupings are presented instead of the traditional quintile presentation [18]. Only two SES groups were generated in this evaluation due to the small overall sample size, the lower half of the SES scores falling into the 'low' sample SES group and the remainder half with higher SES scores assigned to the 'high' sample SES group. Thus, at district and strata level, the distribution of SES status might not be equal but instead could reflect whether the district population is largely of lower or upper SES

status. Of note, however, is that these two SES groupings have not been matched to the South African national SES distribution for the actual national quintile category.
Other key variables were as follows: (i) unplanned pregnancy (measured from a single question on pregnancy intendedness – "When you got pregnant with this baby, did you want to get pregnant at that time?") and contraception use; (ii) re-testing of HIV negative women ("Since 2015 have you been tested for HIV every 3 months?"; (iii) immediate ART initiation of HIV positive women (measured from the question "Were you initiated on ARVs immediately after diagnosis without waiting for blood results"), and (iv) infant HIV testing coverage and infant feeding.

2.5 ETHICAL CONSIDERATIONS

The protocol was approved by the South African Medical Research Council. 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. Permission to access facilities was obtained from the six sampled districts and the respective provinces. Written, signed, informed consent forms for all procedures in the evaluation were obtained from each eligible participant. Informed consents were administered in the language preferred by the participant. Each consented participant was given a confidential study identification number, which was linked to the participant's consent form via a separate log linking participants study numbers to their names. Study numbers did not appear on the consent form. A link log was created to keep track of which study number signed which consent form.

For adolescent participants the following legal guidance was used for human subject's protection:
In terms of Section 129(2). Children's Act 38, 2005 a child may consent to medical treatment of him/herself or his /her child if the child is over the age of 12 years and the child has sufficient mental capacity to understand the benefits, risks, social and other implications of treatment. The National Health Act 61, 2003, 71(2) states that: (2) Where research or experimentation is to be conducted on a minor for therapeutic purpose, the research or experimentation may only be conducted : (a) if it is in the best interests of the minor; (b) in such manner and on such conditions as may be prescribed; (c) with the consent of the parent or guardian of the child; and (d) if the minor is capable of understanding, with the consent of the minor.

Interviews amongst adolescent (13-19 years) mothers / pregnant women were conducted with their consent. Since this Evaluation was low risk, it was permissible within South African research ethical norms to obtain independent consent from adolescents. Further, the Children's Act specifies that children and adolescents have a right to participate in an appropriate way in matters that affect them. All mothers and infants were referred into appropriate care, as needed, if the researcher identified any missed opportunity in their care.

3.0 RESULTS

Results are presented in two main sections: Qualitative results for Objectives 1 and 2, followed by quantitative results for Objectives 3-5.

Quantitative results are ***presented by each objective***, and ***framed within key global goals, as appropriate***, namely with the ***four PMTCT prongs*** ((i) keeping women HIV negative, (ii) preventing unintended pregnancies, (iii) preventing vertical transmission of HIV, and (iv) linking mothers, and their families to HIV-related care), the ***three process indicators to validate the elimination of vertical transmission of HIV*** ((i) antenatal coverage amongst all pregnant women, (ii) HIV testing coverage amongst all women and (iii) triple antiretroviral therapy (ART) coverage amongst HIV positive women, and the ***90-90-90 targets*** (i) HIV testing coverage (ii) ART uptake and (iii) viral load suppression.

3.1 QUALITATIVE RESULTS

Forty-six interviews were conducted (2 National managers, 8 provincial managers, 13 district managers, 11 implementing partners, and 12 facility managers). Focus group discussions were conducted between 19 April 2018 - 14 May 2018 and 06-13 November 2018. Nineteen FGDs were conducted: four with HIV positive adult/older mothers (in OR Tambo, Ekurhuleni, eThekwini, and Ehlanzeni); six with pregnant women regardless of HIV status and age (one per district); two with men (eThekwini and Ehlanzeni); six with HIV negative adult/older mothers (one per district); and one with HIV negative adolescent mothers (eThekwini). Text Boxes 1-5reports the results from **Objectives 1 and 2:**

1. To explore the views of national, provincial, district, and facility-level managers and implementing partners regarding health system readiness for B+ implementation, and effectiveness of PMTCT Option B+ scale-up.
2. To explore service user (adult mothers, young mothers, men) perceptions of PMTCT Option B+.

Text Box 1 summarizes key findings from the national, provincial, district and facility-level interviews. Text Box 2 summarizes the key findings from the service user experiences. Text Box 3 in Appendix 5 presents results of in-depth interviews with national, provincial and district managers, implementing partners and facility level case studies on readiness and buy-in for PMTCT. In the same population of respondents, Text Box 4 in Appendix 5 includes perceived implementation challenges and Text Box 5 in the Appendix presents perceived innovations, enablers, successes, and key considerations. Text Box 6 in Appendix 5 covers results from focus group discussions with service users and includes knowledge of Option B+, client experiences, disclosure, adherence, perceptions of quality, and men's perspectives on PMTCT.

Text Box 1: Summary of the key findings from national, provincial, district and facility-level interviews

KEY FINDING	IMPLICATIONS	RELATIONSHP WITH PUBLISHED DATA*
Communication/Training		
Communication and training plans did not target doctors and counsellors, as a result, they were left out in some of the districts. Centralized planning by all key stakeholders (NDoH, Provincial Managers, District teams and implementing parters (IPs)) on cascaded standardized training facilitated policy roll-out.	Plans for stakeholder consultation, communication, and training for new policies should target and involve all categories of staff involved in the implementation of such policies.	In Malawi, policy communication with all stakeholders was found to be effective in implementation and scale up of Option B+ policy [19]
Buy-in/readiness		
Overall, there was buy-in and willingness to implement the policy at all levels, although it was "rushed and hap hazardous" such that the guidelines were amended for PCR testing and infant prophylaxis a few months later. It was also reported that facility readiness assessments were not done before policy roll out as a result supplies, drugs, data collection tools and human resources were not universally available/adequate. In addition, resistance to perform Birth PCR testing was experienced from labour ward staff at initial stages of implementation, since they were not trained on how to do it.	Data collection tools should be aligned with the policy changes including M & E systems for all indicators that are relevant to the policy under implementation. Allocate adequate time for planning, training and procurement prior the implementation of new policies.	Coutsoudis et al (2013), expressed concerns relating to rapid adoption of the Option B+ and its implications on drug resistance and adherence [19]. Keiffer et al, (2014) reviewing early experiences of Option B + in 11 African countries, found that lack of readiness assessment was a common feature [20]. Tanzania and Uganda experiences, where roll-out was postponed for 3-6 months awaiting arrival of ARVs, very few ARV stock-out and supply chain issues were reported by respondents [21-22]. Phiri N, et al 2019 found that HCWs implementing Option B+ expressed being overburdened and this affected their ability to provide quality care especially on-going counseling [23].
Policy implementation		
IPs played an important role in training and mentoring facility staff, improving quality of data and providing resources (nurses, doctors,	Budget allocation should support continuity of innovations/services offered	In SA, Besada et al, 2018 recommended effective use of Community Care

KEY FINDING	IMPLICATIONS	RELATIONSHP WITH PUBLISHED DATA*
data capturers, computers). Over-reliance on IPs to lead the program affected stakeholder relations (Metro facilities, IP province) and continuity for certain innovations strengthening B+ implementation. WhatsApp groups were useful for sharing ART stock, supplies and to strengthen policy adherence.	IPs for district teams and facility staff. Strengthening M&E strategies for patient management. Use of CHWs is necessary for community based on-going support and linkage to care to assist overburdened HCWs.	Workers (CCWs) to complement PMTCT and provide a link between communities and health facilities, to create demand support for overstretched health workers [24].
Policy guideline adherence		
Not having easy to follow job aids that frontline workers could easily refer to, led to inconsistencies and poor adherence to the policy guideline. There were reported difficulties in adhering to infant prophylactic guidelines. Doctors who were not trained on the policy were not following the protocol a few months after the policy was launched. Few facility managers did not know about the policy under implementation, they heard Option B + for the first time, during interviews for this evaluation. This did not mean that the policy was not implemented or adhered to in those facilities, but this could be as a result of staff rotation and staff mobility.	Job aids should be made available prior implementation, aspects of the policy such as the infant prophylactic guidelines should be simplified, and implementors should ensure that all categories of staff are trained. Strengthen electronic platforms that connect health care providers to information, such as nurse-connect for better support and guideline adherence for rare cases. Scheduled on-site refresher training sessions would also address the gaps due top staff mobility and changes in the management.	
Monitoring and evaluation		
Initially, data collection tools were not aligned with the changes to the policy which led to poor data quality and poor management of patients (e.g. Birth PCR and viral load monitoring); however, subsequently new innovations were introduced (tick register, viral load monitoring, PCR positive tracking tool, unique identifiers, stickers). Some facilities reported that other NGOs involved in community-based HIV testing tended to test clients who had tested before	Data collection tools should be aligned with the policy changes including M & E systems for all indicators that are relevant to the policy under implementation. Strengthening daily/weekly data review meetings and training data captures on the importance of capturing M &	In Malawi, inadequate strategic information management was one of the persistent bottlenecks in the scale up of Option B+ policy. Information management had to be reviewed continuously throughout the implementation process [19].

KEY FINDING	IMPLICATIONS	RELATIONSHP WITH PUBLISHED DATA*
and were known HIV positive on ART (in order to meet their targets for HIV testing). As a result, these clients would not come to PHC facilities for ART initiation and this created gaps in ART initiation rates.	E indicators is crucial for quality of data.	
Quality of services		
Focusing on achieving the 90-90-90 targets has taken away crucial PMTCT elements such as preventing new HIV infections. A shortage of counsellors also resulted to poor quality of counselling and lack of ongoing support for newly diagnosed pregnant women, breastfeeding mothers and potential defaulters. Clients who were on ART prior to pregnancy would sometimes receive ANC services in other facilities and not where they are collecting ART. Concerns were raised about contradicting and confusing policy initiatives like integration of care (which is not always possible due to the nature of infrastructure) vs ideal clinics (which promotes booking of patients.)	Improved counselling strategies should be implemented. Programs and more support for HIV negative pregnant and lactating women are need for EMTCT. Clear strategies that promote integration of care for better access to care and retention in care are needed.	
Client-related factors		
Patient retention in care during post-natal period remains a major barrier to the success of Option B+.	Longitudinal tracking tools such as cohort registers/combining mother-baby cards and stickers as reminders for HCW are necessary to monitor retention.	Study done in Malawi also reported that patient retention in care and ART adherence remain major barriers to the success of Option B+ [25]. Longitudinal tracking cohort tools and registers were also used in Tanzania and they are now used in Zambia.

* not all findings had corresponding information in the published literature

Text Box 2: Summary of the key findings service user experiences

KEY FINDING	IMPLICATIONS	RELATIONSHP WITH PUBLISHED DATA*
Knowledge of PMTCT Option B+		
Generally, there is good HIV testing uptake, ART uptake and few refusals. Few women feared knowing their HIV status as a result some wouldn't access health services opting to give birth at home. Mentor mothers (a program for mentoring /supporting HIV positive pregnant and postnatal mothers) and Mom connect were useful in closing information gaps and giving support for mothers that tested HIV positive.	Strategies to improve early booking are needed. Mentor mothers and use of technology is seen beneficial for PMTCT and other health interventions. This could also be useful for targeting men.	Landon Myer et al, 2017 also recommended that innovative strategies to improve early booking would increase opportunities for policy uptake [26].
Client experiences		
PMTCT clients reported that taking one tablet once daily, feeling healthy, not transmitting HIV to the baby, and having suppressed viral load were enabling factors for ART adherence. The majority of PMTCT mothers disclosed their status to families/male partners and they received positive support including mothers whose partners tested HIV negative after disclosure. Stigma, discrimination, side effects, scarcity of food, denial, lack of privacy, lack of support and non-disclosure were reported as major barriers for non-adherence. Stigma is still a major barrier to accessing services to the extent that clients would shop around or prefer clinics that are far from home to access ART, few clients reported that when you are known to be collecting ART you can be mugged by substance abusers. Clients prefer to use codes when they are amongst their peers so that it's not known.	Good quality of counselling and a good attitude of health care workers impacts positively for access to care, ART adherence, and retention in care. Orientation of health services for clients on ART should not stigmatize clients. There is a need to invest in improved tracking systems to promote patient retention and adherence.	
Counselling		
The majority of mothers did not receive pre-test counselling, however mothers in the PMTCT program received post-test counselling on partner testing, ART adherence, viral load monitoring, infant feeding, infant testing and prophylaxis. Gaps during counselling were reported.	Training more counsellors and improving the quality of counselling is crucial for EMTCT. Given high levels of ART acceptance, and patient concerns about same-day initiation and life-long ART, the need for ongoing counselling and support is critical to increase retention and adherence.	A study done in Malawi reported the same findings with regards to ongoing support for patients on lifelong ART [27].

KEY FINDING	IMPLICATIONS	RELATIONSHP WITH PUBLISHED DATA*
Male partner involvement		
The majority of women complained about accessing health care services during pregnancy and postnatally without male partner support - physically (not available to accompany them) and financially. From women's perspectives, men were seen to be resistant to HIV testing and would not disclose their HIV positive status to their female partners. HIV negative women perceived themselves being exposed to the risk of HIV infection, since they did not fully trust their partners especially those that did not like using condoms. Men stated that condoms are commonly used consistently for the first 3-4 months of the relationship. They often do not use a condom when the woman is pretty, and some claim that the condom causes discomfort. Some men stated that they are beginning to see the importance and benefits of HIV testing now that there has been continuous education and availability of ART.	Improve male access to education promoting HIV testing and other prevention strategies. Use of technology like Mom-connect could be useful in educating men and improving male involvement.	

* not all findings had corresponding information in the published literature.

IMPLICATIONS FOR PROGRAMMES

- Stakeholder consultation and involvement is crucial prior to implementation of new policies such as Option B+ and enough time (6 months) should be given for planning and organization of resources needed for implementation.
- Strengthening effective communication about new policies for all stakeholders is very important, it was concerning noting that few facility managers were not aware about PMTCT guidelines that had been in existence for three years.
- Social marketing strategies including using social media strategies to disseminate and popularize information about new guidelines should be expanded. A recent infant feeding study conducted in South Africa demonstrated that a low-cost mentoring strategy (a facility-based program that focused at mentoring nurses on how to counsel and support mothers on infant feeding) was effective in disseminating infant feeding guidelines (personal communication, Goga et.al. publication under review); mentoring approaches from senior managers / staff at senior level to district and facility levels should be considered.
- New policies should be accompanied with implementation strategies that are well aligned with the M&E tools and HR skills needed.
- CHWs are often overloaded and overworked: the use of technology for health education and support, facilitated their ability to support participants access to care and retention.
- Differentiated packages of care (patient and family-centred care) facilitated adherence and retention and are a strength of the programme; thus, differentiated care should be strengthened.
- Stockouts of drugs and test kits and specimen tubes remain a major concern for EMTCT.
- Staff shortages impact negatively on service delivery in terms of managing patients, quality of data and retention.
- Quality of counselling and testing was somehow compromised due to other priorities (achieving the 90-90-90 targets). This is particularly important as it illustrates that chasing numbers may be counter-productive, and may negatively influence quality of care
- Lack of male involvement remains a challenge that undermines efforts to strengthen family-oriented care) and support for EMTCT.

3.2 QUANTITATIVE RESULTS OF HEALTH WORKER INTERVIEWS, FACILITY ASSESSMENTS AND MOTHER INTERVIEWS

This section reports the results of the following **objectives 3-5:**

3. To investigate PMTCT programme implementation in the context of maternal and child health, from a health care provider perspective.
4. To document facility readiness for implementing PMTCT Option B+ in the context of other maternal and child health interventions.
5. To document mothers' experiences of maternal and child health care in the context of PMTCT Option B+.

3.2.1 PMTCT programme implementation from a health care provider perspective

We sought to monitor PMTCT programme implementation from a health care provider's perspective, including health care provider knowledge and skills on PMTCT Option B+ implementation, and their resilience for implementing this complex health intervention in the context of maternal and child health service provision. Eight hundred and seventy-six (876) health care providers (HCPs) completed self-administered questionnaires (373 professional nurses, 206 lay counsellors, 54 staff nurses, 62 auxiliary nurses, 6 doctors and 175 other (Community Health Care Workers and Mentor Mothers) staff across six districts).

3.2.1.1 Sociodemographic characteristics

The socio-demographic profile of health care workers in the six districts is described in Table 4. The majority of health care providers across all districts were female and were professional nurses.

Table 4: Sociodemographic characteristics of health care providers (n=876) who participated in PMTCT Option B+ Evaluation in South Africa 2018

Characteristic	EC_OR Tambo (n=148)		GP_Ekurhuleni (n=145)		KZN_eThekwini (n=94)		LP_GSekhukhune (n=195)		MP_Ehlanzeni (n=127)		NW_Bojanala (n=167)	
	n	%	n	%	n	%	n	%	n	%	n	%
Gender												
Female	132	89.2	134	92.4	84	89.4	183	93.8	115	90.6	153	91.6
Men	16	10.8	11	7.6	10	10.6	12	6.2	12	9.4	14	8.4
Mean age (SD)		44.3 [9.8]		40.3 [9.0]		43.7 [10.7]		42.7 [8.9]		42.9 [9.3]		41.6 [9.7]
Job title												
Doctor	0	0	0	0	5	5.3	1	0.5	0	0	0	0
Professional nurse	55	37.2	70	48.3	46	48.9	84	43.1	69	54.3	49	29.3
Staff nurse/enrolled nurse	8	5.4	7	4.8	7	7.4	7	3.6	22	17.3	3	1.8
Auxiliary nurse	21	14.2	2	1.4	3	3.2	15	7.7	7	5.5	14	8.4
Lay counsellor	36	24.3	40	27.6	24	25.5	40	20.5	22	17.3	44	26.3
Other (Specify)	28	18.9	26	17.9	9	9.6	48	24.6	7	5.5	57	34.1
Qualification												
Nursing degree	20	13.5	23	16.5	8	8.5	29	14.9	11	8.7	16	9.8
Nursing diploma	51	34.5	47	33.8	49	52.1	64	33	73	57.9	37	22.6
Other (Specify)	77	52	69	49.6	37	39.4	101	52.1	42	33.3	111	67.7

SD-Standard Deviation; EC-Eastern Cape; GP-Gauteng; KZN-KwaZulu-Natal; LP-Limpopo; MP-Mpumalanga; NW-North West. Note responses for each question may not add up to the total because some responses were missing, and in some tables where only two options were possible the table reports on one of the options. Whatever is not reported was the opposite or missing.

3.2.1.2 Facility implementation of PMTCT option B+ and guidelines

Health care provider's views on the effect of PMTCT Option B+ on clinic function is shown in Table 5. Across all the six districts, the majority (>76 %) of health care providers reported that implementation of Option B+ yielded better care whilst a few (<9.0%) observed no change in care. Less than half (50%) of health care providers across the six districts reported changes in staff allocation due to the 2015 PMTCT guidelines. Less than 70% in all six districts had access to the 2015 PMTCT Option B+ guidelines at the clinics and less than 30% had the guidelines as an application on their phone. This is concerning given that the NDoH is no longer printing any guidelines. Less than 60% received training on the new PMTCT guidelines. Access was

least in Bojanala-NW where only 47.2 % reported having the guidelines in the clinic and 39% reported receiving training on the Option B+ PMTCT guidelines.

Table 5: Facility implementation of PMTCT Option B+ and guidelines for PMTCT Option B+ Evaluation in South Africa 2018 (n=874)

Characteristic	EC_ORTambo (n=148)		GP_Ekurhuleni (n=144)		KZN_eThekwini (n=94)		LP_GSekhukhune (n=194)		MP_Ehlanzeni (n=127)		NW_Bojanala (n=167)	
	n	%	n	%	n	%	n	%	n	%	n	%
Perceived effect of PMTCT on clinic												
Better care	123	83.1	118	81.9	75	79.8	157	80.9	100	78.7	127	76.0
Worse care provision	13	8.8	16	11.1	10	10.6	20	10.3	14	11.0	20	12.0
No change	8	5.4	8	5.6	5	5.3	13	6.7	11	8.7	15	9.0
Other (Specify)	4	2.7	2	1.4	4	4.3	4	2.1	2	1.6	5	3.0
Changes in staff allocation due to 2015 PMTCT guidelines												
Yes	56	38.4	45	31.5	42	44.7	67	34.4	37	29.6	53	32.1
Have access to 2015 PMTCT Option B+ guidelines in clinic												
Yes	86	58.1	80	57.1	62	66.0	108	55.7	85	68.0	76	47.2
Have the January 2015 SA PMTCT guidelines as an app on personal phone												
Yes	31	21.1	21	14.8	17	18.1	31	16.1	22	17.6	19	11.4
Received training or re-orientation on 2015 PMTCT guidelines												
Yes	69	47.3	62	42.8	55	58.5	95	49.0	59	46.8	64	39.0

SD-Standard Deviation; EC-Eastern Cape; GP-Gauteng; KZN-KwaZulu-Natal; LP-Limpopo; MP-Mpumalanga; NW-North West.
Note responses for each question may not add up to the total because some responses were missing, and in some tables where only two options were possible the table reports on one of the options.

3.2.1.3 Health care provider knowledge of 2015 SA PMTCT guideline and 2017 infant feeding update

Across all six districts, less than 70% of healthcare providers had optimal (>80%) knowledge of PMTCT practices (Table 6). This included knowledge about immediate initiation of ART, retesting of HIV-negative women and viral load/CD4 cell count testing and follow-up of mother-infant pairs, testing of HIV exposed infants, and breastfeeding support. Less than 50% of healthcare providers in OR Tambo and Ehlanzeni districts had optimal knowledge about when to initiate lifelong ART regardless of CD4 cell count. Optimal knowledge of Infant HIV testing guidelines, as per 2015 SAPMTCT policy was poor across all six districts. Healthcare providers in Ehlanzeni district had the lowest knowledge of retesting time points of HIV negative mothers (3-monthly through pregnancy; labour/delivery; 6-week infant immunization visit).

Table 6: Health care provider knowledge of 2015 SAPMTCT guideline and 2017 infant feeding update – findings from PMTCT Option B+ Evaluation in South Africa 2018

	EC_ORTambo		GP_Ekurhuleni		KZN_eThekwini		LP_GSekhukhune		MP_Ehlanzeni		NW_Bojanala		p-value
	n	% (95% CI)	n	% (95% CI)	n	% (95% CI)	n	% (95% CI)	n	% (95% CI)	n	% (95% CI)	
PMTCT Practices													
≥80% knowledge of PMTCT practices in facilities[$]	93	62.8 [52.4,72.2]	89	61.0 [53.7,67.8]	64	68.1 [56.0,78.1]	101	51.8 [41.9,61.6]	64	50.4 [41.6,59.2]	98	58.7 [49.2,67.5]	**P= 0.126**
When to initiate lifelong ART regardless of CD4 cell count													
≥80% Knowledge of when to initiate lifelong ART regardless of CD4 count[@]	70	47.3 [38.0,56.8]	75	51.4 [43.2,59.4]	65	69.1 [56.2,79.7]	121	62.1 [54.9,68.7]	61	48.0 [37.7,58.5]	94	56.3 [47.8,64.4]	**P=0.015**
Infant HIV testing guidelines, as per 2015 SAPMTCT policy													
≥80% knowledge of infant HIV testing guidelines, as per 2015 policy[#]	4	2.7 [1.0,6.8]	12	8.2 [5.2,12.7]	4	4.3 [2.1,8.3]	16	8.2 [4.3,15.1]	3	2.4 [0.8,6.7]	12	7.2 [4.4,11.6]	**P=0.060**
Time points for re-testing of HIV-negative mothers	n=279		n=275		n=200		n=369		n=212		n=301		
3-monthly through pregnancy	113	76.4 [67.5,83.4]	104	71.2 [61.8,79.2]	70	74.5 [64.0,82.7]	113	57.9 [48.3,67.0]	73	57.5 [47.6,66.8]	114	68.3 [58.2,76.9]	**p=0.011**
At labour/delivery	51	34.5 [27.9,41.7]	52	35.6 [27.2,45.1]	43	45.7 [36.0,55.8]	88	45.1 [35.9,54.7]	33	26.0 [20.7,32.1]	63	37.7 [30.3,45.8]	**p=0.018**
At 6-week infant immunization visit	69	46.6 [37.7,55.8]	63	43.2 [31.7,55.3]	41	43.6 [32.6,55.3]	100	51.3 [41.2,61.3]	51	40.2 [29.8,51.5]	70	41.9 [34.9,49.3]	p=0.622
Every 12 weeks throughout breastfeeding up to 24 months	46	31.1 [21.7,42.3]	56	38.4 [28.8,48.9]	46	48.9 [39.0,58.9]	68	34.9 [28.0,42.4]	55	43.3 [34.5,52.6]	54	32.3 [24.7,41.0]	p=0.113

CI-confidence intervals; SD-Standard Deviation; EC-Eastern Cape; GP-Gauteng; KZN-KwaZulu-Natal; LP-Limpopo; MP-Mpumalanga; NW-North West

[$]*Questions included in defining PMTCT Practices included are in appendix 6*

[@]*Questions included in defining knowledge included Initiating lifelong ART regardless of CD4 cell count is needed for is in appendix 6*

[#]*Questions included in defining Infant HIV testing guidelines, as per 2015 SAPMTCT policy is in appendix 7*

** ≥80% knowledge includes those who got ≥80% of the questions listed above correct*

3.2.1.4 Health care providers views on test and treat

We sought to understand how health care providers perceived the implementation of the test and treat policy and how it affected them. Table 7 shows their responses when asked about their views on universal testing and treating all HIV positive people. Across all six districts, more than 80% of health care providers had positive views on universal testing and treatment (i.e. agreed/agreed completely).

Table 7: HCP's views on universal testing and treating of HIV positive people (n=868) – findings from PMTCT Option B+ Evaluation in South Africa 2018

	EC_ORTambo (n=148)		GP_Ekurhuleni (n=144)		KZN_eThekwini (n=94)		LP_GSekhukhune (n=193)		MP_Ehlanzeni (n=126)		NW_Bojanala (n=163)		p-value
	n	% (95% CI)	n	% (95% CI)	n	% (95% CI)	n	% (95% CI)	n	% (95% CI)	n	% (95% CI)	
Agree completely	93	62.8 [52.6,72.0]	91	63.2 [55.5,70.3]	57	60.6 [49.6,70.7]	113	58.5 [50.1,66.5]	64	50.8 [41.6,59.9]	91	55.8 [48.8,62.6]	
Agree	35	23.6 [16.5,32.7]	32	22.2 [17.0,28.5]	20	21.3 [14.5,30.1]	56	29.0 [23.3,35.4]	44	34.9 [27.4,43.2]	44	27.0 [22.2,32.3]	
Neutral	11	7.4 [3.3,16.0]	17	11.8 [7.7,17.7]	10	10.6 [6.6,16.7]	11	5.7 [2.9,11.0]	10	7.9 [4.3,14.2]	15	9.2 [5.3,15.4]	p=0.510
Disagree	1	0.7 [0.1,4.5]	1	0.7 [0.1,4.8]	3	3.2 [1.3,7.7]	2	1.0 [0.3,3.9]	3	2.4 [0.8,6.8]	2	1.2 [0.3,4.6]	
Completely disagree	1	0.7 [0.1,4.6]	3	2.1 [0.7,5.9]	0	0	3	1.6 [0.5,4.4]	0	0	4	2.5 [1.0,5.9]	
Other	7	4.7 [1.9,11.1]	0	0	4	4.3 [1.4,12.6]	8	4.1 [2.0,8.5]	5	4 [1.8,8.4]	7	4.3 [2.0,9.0]	

CI-confidence intervals; SD-Standard Deviation; EC-Eastern Cape; GP-Gauteng; KZN-KwaZulu-Natal; LP-Limpopo; MP-Mpumalanga; NW-North West. Note responses for each question may not add up to the total because some responses were missing, and in some tables where only two options were possible the table reports on one of the options.

3.2.1.5 TB-HIV care integration in facility

Table 8 provides information on TB and HIV service integration in the sampled facilities. More than 90% of healthcare providers across the six districts reported that there was TB-HIV integration in the facilities. Integration included screening of all pregnant women for TB or all pregnant HIV positive women are screened for TB.

Table 8: HCP's responses on TB-HIV care integration in the facility (n=871) – findings from PMTCT Option B+ Evaluation in South Africa 2018

	EC_ORTambo (n=148)		GP_Ekurhuleni (n=145)		KZN_eThekwini (94)		LP_GSekhukhune (193)		MP_Ehlanzeni (126)		NW_Bojanala (165)		p-value
	n	% (95% CI)	n	% (95% CI)	n	% (95% CI)	n	% (95% CI)	n	% (95% CI)	n	% (95% CI)	
All pregnant women are screened for TB	79	53.4 [44.8,61.7]	104	71.7 [62.4,79.5]	64	68.1 [55.0,78.8]	134	69.4 [62.4,75.7]	77	61.1 [51.7,69.8]	86	52.1 [45.1,59.1]	
All pregnant HIV positive women are screened for TB	59	39.9 [30.7,49.8]	27	18.6 [12.6,26.7]	24	25.5 [15.1,39.9]	47	24.4 [17.9,32.2]	27	21.4 [14.8,30.0]	49	29.7 [22.8,37.7]	
Happens intermittently	4	2.7 [1.1,6.2]	6	4.1 [1.6,10.3]	3	3.2 [1.2,8.0]	4	2.1 [0.6,6.5]	9	7.1 [3.7,13.5]	10	6.1 [3.1,11.6]	p=0.427
So busy it does not happen	0	0	0	0	0	0	0	0	0	0	1	0.6 [0.1,4.0]	
Don't know	2	1.4 [0.4,4.8]	3	2.1 [0.7,5.7]	1	1.1 [0.2,6.0]	2	1.0 [0.3,3.9]	2	1.6 [0.4,6.0]	6	3.6 [1.8,7.3]	
Other	4	2.7 [0.8,8.3]	5	3.4 [1.6,7.2]	2	2.1 [0.5,8.4]	6	3.1 [1.3,7.1]	11	8.7 [4.6,16.1]	13	7.9 [4.7,12.9]	

CI-confidence intervals; SD-Standard Deviation; TB-Tuberculosis; EC-Eastern Cape; GP-Gauteng; KZN-KwaZulu-Natal; LP-Limpopo; MP-Mpumalanga; NW-North West. Note responses for each question may not add up to the total because some responses were missing, and in some tables where only two options were possible the table reports on one of the options.

3.2.1.6 Interventions when viral load is >1000 copies/ml

Table 9 shows the types of interventions taken by different health care providers in different facilities when the viral load of an HIV positive mother is ≥1000 copies/ml. More than 90% of health care providers in all six districts reported that they counsel pregnant HIV positive women and mothers when the viral load has risen > 1000 copies/ml. The proportion that refer to another clinic at eThekwini (66%) is significantly higher than in all other districts. A small percentage of health care providers opt to scold pregnant women and mothers ranging from 9.7% in eThekwini to 23.8% in Bojanala. Some health care providers reported that they do "nothing" when the viral load exceeds 1000 copies/ml.

Table 9: Interventions when viral load is >1000 copies/ml - findings from PMTCT Option B+ Evaluation in South Africa 2018

	EC_ORTambo (n=318)		GP_Ekurhuleni (n=242)		KZN_eThekwini (n=190)		LP_GSekhukhune (n=388)		MP_Ehlanzeni (n=231)		NW_Bojanala (n=346)		p-value
	n	% (95% CI)	n	% (95% CI)	n	% (95% CI)	n	% (95% CI)	n	% (95% CI)	n	% (95% CI)	
Adherence counselling	145	98.0 [94.6,99.2]	142	98.6 [94.9,99.6]	90	95.7 [83.7,99.0]	184	95.3 [91.0,97.6]	122	96.8 [90.5,99.0]	151	91.5 [82.5,96.1]	P=0.172
Refer to another clinic	80	55.6 [44.2,66.4]	56	41.5 [30.7,53.1]	62	66.0 [57.6,73.4]	85	44 [34.7,53.9]	39	31.2 [23.4,40.2]	86	54.1 [45.6,62.3]	**p<0.0001**
Refer to the doctor	49	33.6 [22.7,46.4]	19	14.7 [10.0,21.1]	22	23.4 [14.8,35.0]	59	30.6 [24.4,37.6]	25	20.0 [12.8,29.8]	49	30.6 [23.8,38.4]	**p<0.047**
Nothing	23	16.0 [9.6,25.5]	10	7.8 [4.7,12.7]	7	7.4 [3.5,15.1]	23	11.9 [7.0,19.5]	19	15.3 [8.8,25.4]	24	15.2 [10.1,22.2]	p=0.186
Scold mother	21	15.1 [9.1,24.0]	15	13.6 [8.9,20.3]	9	9.7 [4.7,18.8]	37	19.2 [13.5,26.5]	26	21.0 [15.2,28.1]	36	23.8 [18.7,29.9]	p=0.056

CI-confidence intervals; SD-Standard Deviation; EC-Eastern Cape; GP-Gauteng; KZN-KwaZulu-Natal; LP-Limpopo; MP-Mpumalanga; NW-North West

IMPLICATIONS FOR PROGRAMMES

Communication about new policies needs to be improved and done timely from policy makers to implementation levels. Across all six districts, about a third did not have access to the 2015 PMTCT guidelines, and less than 60% had been trained on them at the time of data collection. Further, the results also show that knowledge about PMTCT practices was suboptimal. Results from qualitative data show that one- or two-day sessions were held at district, sub-districts, and facility levels. These trainings may have missed some HCWs. However, planned follow-up training and mentoring activities by provincial and district teams were said to be in the pipeline, and should be integrated and informed by data and critical identified bottlenecks. Trainings are needed to capacitate healthcare workers on the PMTCT policies so that they can provide optimal care to their clients.

3.2.2 Facility readiness for implementing PMTCT Option B+ in the context of other MCH interventions

The following six tables (Table 10-14) show district differences in the availability of items and processes required to provide optimum MNCH and PMTCT services. These include the availability of: (i) the recommended ANC/PMTCT related guidelines and records necessary for clinical recording and data collection tools (Table 10); (ii) equipment necessary for essential screening investigations for key conditions (Table 11); (iii) medications including ARVs, prophylaxis, micro-supplements, and contraceptives essential during the post-natal period (Table 12); (iv) processes used to facilitate linkages to care (Table 13); and (v) how services are integrated (Table 14).

3.2.2.1 Facilities with documents necessary for PMTCT implementation

Only 75 % of facilities in Bojanala had the 2015 PMTCT guideline and National Contraception and Fertility Planning Policy and Service Delivery Guidelines (Table 10). The cross-sectional register for routine data capturing was the least (45.8%) available in facilities in OR Tambo district.

Table 10: Number of facilities with documents necessary for PMTCT implementation including preventing unplanned pregnancy, quality antenatal care, PMTCT-related care and monitoring to ensure linkages to care - PMTCT Option B+ Evaluation in South Africa 2018

District (N=all facilities in evaluation)	EC_ORTambo (n=24)		GP_Ekurhuleni (n=25)		KZN_eThekwini (n=25)		LP_GSekhukhune (n=25)		MP_Ehlanzeni (n=25)		NW_Bojanala (n=28)		p-value
	n	% (95% CI)	n	% (95% CI)	n	% (95% CI)	n	% (95% CI)	n	% (95% CI)	n	% (95% CI)	
2015 PMTCT guideline	23	95.8 [74.5,99.4]	23	92.0 [72.2, 98.1]	24	96.0 [75.4, 99.5]	24	96.0 [75.4, 99.5]	24	96.0 [75.4,99.5]	21	75.0 [55.5, 87.8]	0.157
Maternity care guideline	22	91.7 [71.2,98.0]	25	100	25	100	24	96.0 [75.4, 99.5]	25	100	26	92.9 [74.8, 98.3]	0.324
Expanded Programme on Immunisation (EPI schedule)	23	95.8 [74.5, 99.4]	25	100	25	100	24	96.0 [75.4, 99.5]	24	96.0 [75.4, 99.5]	24	85.7 [66.9, 94.7]	0.266
Road to health booklet	24	100	25	100	24	96.0 [75.4, 99.5]	25	100	25	100	27	96.4 [77.7, 99.5]	0.578
Antenatal care (ANC) card	22	91.7 [71.2, 98.0]	25	100	23	92.0 [72.2, 98.1]	25	100	23	92.0 [72.2, 98.1]	27	96.4 [77.7, 99.5]	0.431
National Contraception and Fertility Planning Policy and Service Delivery Guidelines	20	83.3 [62.3, 93.8]	25	100	23	92.0 [72.2, 98.1]	23	92.0 [72.2, 98.1]	25	100	21	75.0 [55.5, 87.8]	**0.022**
Partogram	16	66.7 [45.5, 82.7]	18	72.0 [51.2, 86.3]	20	80.0 [59.3, 91.6]	24	96.0 [75.4, 99.5]	22	88.0 [67.9, 96.2]	19	67.9 [48.3, 82.7]	**0.047**
Cross sectional register for routine data	11	45.8 [27.0, 65.9]	17	68.0 [47.2, 83.5]	20	80.0 [59.3, 91.6]	22	88.0 [67.9, 96.2]	14	56.0 [36.1, 74.1]	20	71.4 [51.9, 85.3]	**<0.0001**
Tier.net	22	91.7 [71.2, 98.0]	24	96.0 [75.4, 99.5]	25	100	25	100	25	100	28	100	0.178

CI-confidence intervals; SD-Standard Deviation; EC-Eastern Cape; GP-Gauteng; KZN-KwaZulu-Natal; LP-Limpopo; MP-Mpumalanga; NW-North West

3.2.2.2 Equipment available in working order and supplies available within expiry dates

It was encouraging to find that in this evaluation, all except one facility in Ekurhuleni, had the BP machine in good working order (Table 11). Urine dipsticks used to assess bladder or kidney infections, diabetes, dehydration, and preeclampsia during pregnancy were not available in 100% of facilities in OR Tambo, Greater Sekhukhune, and Bojanala. Anaemia, which does not respond to iron tablets (i.e. no change in haemoglobin level), is a risk factor during pregnancy and PPH is a serious life-threatening emergency, it is critical to periodically monitor the pregnant woman's antenatal haemoglobin status. It was concerning to note significant differences in the availability of haemoglobinometers in the six districts; only one district (Ekurhuleni) had all facilities with this item in good working order. Adult HIV test kits were also present in all

facilities in all the six districts. Only one district (eThekwini) attained 100% for DBS cards. No provinces attained 100% for DBS drying racks. This maybe be attributed to lack of stock management. Three out of 6 provinces attained 100% for sealable bags. Hereto, this should represent 100% of the facilities with stocks of sealable bags. No blood samples/DBS cards can be sent to central laboratory for testing without these sealable bags.

Table 11: Facilities with Equipment available in working order and supplies available within expiry dates – essential for ANC care - findings from PMTCT Option B+ Evaluation in South Africa 2018

District (N=all facilities in evaluation)	EC_ORTambo (n=24)		GP_Ekurhuleni (n=25)		KZN_eThekwini (n=25)		LP_GSekhukhune (n=25)		MP_Ehlanzeni (n=25)		NW_Bojanala (n=28)		p-value
	n	% (95% CI)	n	% (95% CI)	n	% (95% CI)	n	% (95% CI)	n	% (95% CI)	n	% (95% CI)	
Equipment to implement essential ANC care for women with HIV													
Blood pressure machine	24	100.0	24	96.0 [75.4, 99.5]	25	100.0	25	100.0	25	100.0	28	100.0	0.402
Glucometer	23	95.8 [74.5, 99.4]	24	96.0 [75.4, 99.5]	25	100..	24	96.0 [75.4, 99.5]	23	92.0 [72.2, 98.1]	28	100.0	0.596
Haemoglobinometer	20	83.3 [62.3, 93.8]	25	100.0	24	96.0 [75.4, 99.5]	14	56.0 [36.1, 74.1]	20	80.0 [59.3, 91.6]	24	85.7 [66.9, 94.7]	**0.001**
Adult scale	24	100.0	25	100.0	25	100.0	25	100.0	25	100.0	28	96.4 [77.7, 99.5]	0.486
Supplies													
Urine dipstix	22	91.7 [71.2, 98.0]	25	100.0	25	100	15	60.0 [39.7, 77.4]	25	100	27	96.4 [77.7, 99.5]	**<0.0001**
Adult HIV test kits	24	100	25	100.0	25	100	25	100	25	100	28	100	n/a
Rapid syphilis test kits	10	41.7 [23.6, 62.2]	13	52.0 [32.6, 70.8]	24	96.0 [75.4, 99.5]	6	24.0 [10.9, 44.8]	15	60.0 [39.7, 77.4]	5	17.9 [7.5, 37.0]	**<0.0001**
Equipment to implement essential Infant Care													
Baby scale	24	100.0	25	100.0	25	100.0	24	96.0 [75.4, 99.5]	25	100.0	28	100.0	0.402
Dried blood spot (DBS cards) with desiccant	22	91.7 [71.2, 98.0]	24	96.0 [75.4, 99.5]	25	100.0	23	92.0 [72.2, 98.1]	22	88.0 [67.9, 96.2]	25	89.3 [70.9, 96.6]	0.585
DBS drying racks	19	79.2 [57.9, 91.3]	24	96.0 [75.4, 99.5]	24	96.0 [75.4, 99.5]	22	88.0 [67.9, 96.2]	23	92.0 [72.2, 98.1]	22	78.6 [59.2, 90.3]	0.358

Weigh paper or glassine envelopes	14	58.3 [37.8, 76.4]	19	76.0 [55.2, 89.1]	21	84.0 [63.6, 94.0]	20	80.0 [59.3, 91.6]	12	48.0 [29.2, 67.4]	20	71.4 [51.9, 85.3]	**0.001**
Sealable bags	24	100.0	24	96.0 [75.4, 99.5]	25	100.0	21	84.0 [63.6, 94.0]	25	100.0	26	92.9 [74.8, 98.3]	**0.035**

CI-confidence intervals; SD-Standard Deviation; EC-Eastern Cape; GP-Gauteng; KZN-KwaZulu-Natal; LP-Limpopo; MP-Mpumalanga; NW-North West

3.2.2.3 Medication/contraceptives available and within expiry dates

Apart from (intrauterine device) IUD's it was encouraging to note that most (over 80%) of the facilities had adequate stock for contraceptives (Table 12). Availability of IUDs in OR Tambo was extremely low (16.7% of facilities) and availability of implants (28,8% of facilities) in Ehlanzeni was low. Over half, 52.0% and 60.7% facilities in Ekurhuleni and Bojanala, respectively, had a low supply of Benzathine penicillin. It was reported that it was a supply problem in these provinces and has since been resolved. Ehlanzeni had the lowest percentage of facilities with cotrimoxazole tablets (68.0%), whilst OR Tambo had the lowest for nevirapine tablets (16.7%). Most (72.0%) of facilities in Greater Sekhukhune had (AZT) syrup available. Lamivudine (LTC) syrup - in view of the new guideline facilities with under 95% should be considered for rapid scale up.

Table 12: Facilities with Medication/contraceptives available and within expiry dates - findings from PMTCT Option B+ Evaluation in South Africa 2018

District (N=all facilities in evaluation)	**EC_ORTambo (n=24)**		**GP_Ekurhuleni (n=25)**		**KZN_eThekwini (n=25)**		**LP_GSekhukhune (n=25)**		**MP_Ehlanzeni (n=25)**		**NW_Bojanala (n=28)**		**p-value**
	n	**% (95% CI)**	**n**	**% (95% CI)**	**n**	**% (95% CI)**	**n**	**% (95% CI)**	**n**	**% (95% CI)**	**n**	**% (95% CI)**	
Contraceptives													
Emergency oral contraceptives	19	79.2 [57.9, 91.3]	21	84.0 [63.6, 94.0]	24	96.0 [75.4, 99.5]	19	76.0 [55.2, 89.1]	21	84.0 [63.6, 94.0]	17	60.7 [41.5, 77.1]	0.073
Male condoms	23	95.8 [74.5, 99.4]	25	100.0	25	100.0	24	96.0 [75.4, 99.5]	25	100.0	28	100.0	0.512
Female condoms	22	91.7 [71.2, 98.0]	25	100.0	22	88.0 [67.9, 96.2]	22	88.0 [67.9, 96.2]	24	96.0 [75.4, 99.5]	26	92.9 [74.8, 98.3]	0.442
Hormonal oral contraceptives	21	87.5 [66.8, 96.1]	23	92.0 [72.2, 98.1]	20	80.0 [59.3, 91.6]	22	88.0 [67.9, 96.2]	23	92.0 [72.2, 98.1]	25	89.3 [70.9, 96.6]	0.782
Hormonal injectables	23	95.8 [74.5, 99.4]	24	96.0 [75.4, 99.5]	21	84.0 [63.6, 94.0]	23	92.0 [72.2, 98.1]	23	92.0 [72.2, 98.1]	28	100.0	0.283

District (N=all facilities in evaluation)	**EC_ORTambo (n=24)**		**GP_Ekurhuleni (n=25)**		**KZN_eThekwini (n=25)**		**LP_GSekhukhune (n=25)**		**MP_Ehlanzeni (n=25)**		**NW_Bojanala (n=28)**		**p-value**
Intrauterine devices	4	16.7 [6.2, 37.7]	11	44.0 [25.9, 63.9]	22	88.0 [67.9, 96.2]	14	56.0 [36.1, 74.1]	6	24.0 [10.9, 44.8]	10	35.7 [20.1, 55.1]	**<0.0001**
Implants	18	75.0 [53.7, 88.6]	23	92.0 [72.2, 98.1]	25	100.0	23	92.0 [72.2, 98.1]	7	28.0 [13.7, 48.8]	18	64.3 [44.9, 79.9]	**<0.0001**
Adult medication for ANC care													
Benzathine penicillin	24	100	13	52.0 [32.6, 70.8]	23	92.0 [72.2, 98.1]	25	100	22	88.0 [67.9, 96.2]	17	60.7 [41.5, 77.1]	**<0.0001**
Iron supplements	23	95.8 [74.5, 99.4]	25	100	25	100	22	88.0 [67.9, 96.2]	20	80.0 [59.3, 91.6]	22	78.6 [59.2, 90.3]	**0.019**
Adult ARVs and HIV related prophylaxis													
Cotrimoxazole tablets	20	83.3 [62.3, 93.8]	21	84.0 [63.6, 94.0]	24	96.0 [75.4, 99.5]	22	88.0 [67.9, 96.2]	17	68.0 [47.2, 83.5]	24	85.7 [66.9, 94.7]	0.131
Lamivudine (3TC) tablets	22	91.7 [71.2, 98.0]	24	96.0 [75.4, 99.5]	25	100	23	92.0 [72.2, 98.1]	25	100	27	96.4 [77.7, 99.5]	0.498
Nevirapine tablets	4	16.7 [6.2, 37.7]	20	80.0 [59.3, 91.6]	11	44.0 [25.9, 63.9]	25	100	18	72.0 [51.2, 86.3]	22	78.6 [59.2, 90.3]	**<0.0001**
Fixed-dose Combination (FDC)	24	100	25	100	25	100	25	100	25	100	27	96.4 [77.7, 99.5]	0.486
Azidothymidine (AZT) tablets	21	87.5 [66.8, 96.1]	25	100	25	100	21	84.0 [63.6, 94.0]	21	84.0 [63.6, 94.0]	22	78.6 [59.2, 90.3]	0.063
Infant medication													
Cotrimoxazole syrup	19	79.2 [57.9, 91.3]	25	100	25	100	16	64.0 [43.4, 80.5]	25	100	23	82.1 [63.0, 92.5]	**<0.0001**
Nevirapine syrup	23	95.8 [74.5, 99.4]	25	100	25	100	23	92.0 [72.2, 98.1]	24	96.0 [75.4, 99.5]	27	96.4 [77.7, 99.5]	0.616
Azidothymidine (AZT) syrup	19	79.2 [57.9, 91.3]	24	96.0 [75.4, 99.5]	21	84.0 [63.6, 94.0]	18	72.0 [51.2, 86.3]	24	96.0 [75.4, 99.5]	26	92.9 [74.8, 98.3]	**<0.0001**
Lamivudine (3TC) syrup	24	100	23	92.0 [72.2, 98.1]	21	84.0 [63.6, 94.0]	22	88.0 [67.9, 96.2]	24	96.0 [75.4, 99.5]	25	89.3 [70.9, 96.6]	0.003

CI-confidence intervals; SD-Standard Deviation; EC-Eastern Cape; GP-Gauteng; KZN-KwaZulu-Natal; LP-Limpopo; MP-Mpumalanga; NW-North West

3.2.2.4 Processes that facilitate linkage to care for HIV infected mothers and their infants

3.2.2.4.1 How facilities access birth PCR results

The most common methods used by facilities to access birth PCR results were calls the laboratory and using the unique barcode on the infants Road to Health Booklet (RtHB) delivered to the facility or use SMS printer (Table 13). Accessing birth PCR results by having the results delivered to the facility or using a SMS printer was low in Ekurhuleni (64.0%) and eThekwini (68.0%). Accessing birth HIV, maternal viral Load and CD4 cell count tests was high with in 5 districts (over 50% in OR Tambo, Ekurhuleni, eThekwini, Greater Sekhukhune, Ehlanzeni) when calling the place of birth for results. The delivery of hard copies infant HIV test results and maternal viral load results by a driver from the lab to the health facility was high in all districts.

3.2.2.4.2 Facilities with the following systems

Tracing and calling clients for repeat testing was high in all districts (Table 13). The use of lay/TB counsellors /DOTs for patient contact was low in four districts OR Tambo, Greater Sekhukhune, Ehlanzeni, and Bojanala. With the DOH expansion of the community outreach programmes, there is room for improvement.

3.2.2.4.3 Turnaround times for results between facility and laboratory from day of blood draw

According to participants recall (RECALL noted below), the turnaround time for relaying results to mother from the day of blood draw within 7 days or less was relatively high across all districts (Table 13); however, our random review of records did not verify this.

Table 13: Processes that facilitate linkage to care for HIV infected mothers and their infants - findings from PMTCT Option B+ Evaluation in South Africa 2018

District (N=all facilities in evaluation)	EC_ORTambo (n=24)		GP_Ekurhuleni (n=25)		KZN_eThekwini (n=25)		LP_GSekhukhune (n=25)		MP_Ehlanzeni (n=25)		NW_Bojanala (28)		p-value
	n	% (95% CI)	n	% (95% CI)	n	% (95% CI)	n	% (95% CI)	n	% (95% CI)	n	% (95% CI)	
How facilities access birth PCR results													
Facility calls the laboratory and using the unique barcode on the infants RtHB	22	91.7 [71.2, 98.0]	17	68.0 [47.2, 83.5]	19	76.0 [55.2, 89.1]	18	72.0 [51.2, 86.3]	18	72.0 [51.2, 86.3]	19	67.9 [48.3, 82.7]	0.449
Facility calls the place of birth	14	58.3 [37.8, 76.4]	17	68.0 [47.2, 83.5]	15	60.0 [39.7, 77.4]	15	60.0 [39.7, 77.4]	14	56.0 [36.1, 74.1]	12	42.9 [25.8, 61.8]	0.745
Results are delivered to the facility or use SMS printer	22	91.7 [71.2, 98.0]	16	64.0 [43.4, 80.5]	17	68.0 [47.2, 83.5]	21	84.0 [63.6, 94.0]	22	88.0 [67.9, 96.2]	21	75.0 [55.5, 87.8]	0.104

District (N=all facilities in evaluation)	**EC_ORTambo (n=24)**		**GP_Ekurhuleni (n=25)**		**KZN_eThekwini (n=25)**		**LP_GSekhukhune (n=25)**		**MP_Ehlanzeni (n=25)**		**NW_Bojanala (28)**		**p-value**
Using lab tracking	20	83.3 [62.3, 93.8]	17	68.0 [47.2, 83.5]	19	76.0 [55.2, 89.1]	12	48.0 [29.2, 67.4]	10	40.0 [22.6, 60.3]	14	50.0 [31.9, 68.1]	**0.012**
Main method for receiving infant HIV test results (rest use mail/SMS)													
Driver from the lab/district delivers hard copy or SMS printer or NHLS printer	23	95.8 [74.5, 99.4]	21	84.0 [63.6, 94.0]	21	84.0 [63.6, 94.0]	25	100	24	96.0 [75.4, 99.5]	26	92.9 [74.8, 98.3]	0.176
Main methods used for receiving viral load results (rest use email/SMS/other)													
Driver from the lab/district delivers hard copy or SMS printer or NHLS printer	23	95.8 [74.5, 99.4]	21	84.0 [63.6, 94.0]	21	84.0 [63.6, 94.0]	25	100	25	100	26	92.9 [74.8, 98.3]	0.076
Main method of receiving CD4 cell count results (rest use email/SMS/other)													
Driver from the lab/district delivers hard copy or SMS printer or NHLS printer	23	95.8 [74.5, 99.4]	22	88.0 [67.9, 96.2]	21	84.0 [63.6, 94.0]	25	100	24	96.0 [75.4, 99.5]	26	92.9 [74.8, 98.3]	0.271
Facility uses point of care testing (YES)	13	54.2 [34.1, 73.0]	14	56.0 [36.1, 74.1]	18	75.0 [53.7, 88.6]	9	36.0 [19.5, 56.6]	10	40.0 [22.6, 60.3]	13	46.4 [28.8, 65.0]	**0.004**
For TB	11	45.8 [27.0, 65.9]	13	52.0 [32.6, 70.8]	14	56.0 [36.1, 74.1]	7	28.0 [13.7, 48.8]	9	36.0 [19.5, 56.6]	10	35.7 [20.1, 55.1]	0.305
For viral load	12	50.0 [30.5, 69.5]	13	52.0 [32.6, 70.8]	14	56.0 [36.1, 74.1]	7	28.0 [13.7, 48.8]	10	40.0 [22.6, 60.3]	9	32.1 [17.3, 51.7]	0.238
For CD4 cell count	10	41.7 [23.6, 62.2]	13	52.0 [32.6, 70.8]	13	52.0 [32.6, 70.8]	6	24.0 [10.9, 44.8]	9	36.0 [19.5, 56.6]	9	32.1 [17.3, 51.7]	0.253
For EID	1	4.2 [0.6, 25.5]	3	12.0 [3.8, 32.1]	3	12.0 [3.8, 32.1]	1	4.0 [0.5, 24.6]	0	0	1	3.6 [0.5, 22.3]	0.362
Facilities with the following systems													
Recording of abnormal PCR results	15	62.5 [41.6, 79.6]	21	84.0 [63.6, 94.0]	20	83.3 [62.3, 93.8]	16	64.0 [43.4, 80.5]	18	72.0 [51.2, 86.3]	16	57.1 [38.2, 74.2]	**0.009**
Repeat HIV test for non-negative results	19	79.2 [57.9, 91.3]	24	96.0 [75.4, 99.5]	22	91.7 [71.2, 98.0]	21	84.0 [63.6, 94.0]	21	84.0 [63.6, 94.0]	24	85.7 [66.9, 94.7]	0.707
Monitoring 1year retention in care using hardcopy notebooks/registers	13	54.2 [34.1, 73.0]	8	32.0 [16.5, 52.8]	16	64.0 [43.4, 80.5]	12	48.0 [29.2, 67.4]	18	72.0 [51.2, 86.3]	7	25.0 [12.2, 44.5]	**0.004**

District (N=all facilities in evaluation)	EC_ORTambo (n=24)		GP_Ekurhuleni (n=25)		KZN_eThekwini (n=25)		LP_GSekhukhune (n=25)		MP_Ehlanzeni (n=25)		NW_Bojanala (28)		p-value
Monitoring 1-year retention in care using electronic system(tier)	10	41.7 [23.6, 62.2]	12	48.0 [29.2, 67.4]	15	60.0 [39.7, 77.4]	13	52.0 [32.6, 70.8]	6	24.0 [10.9, 44.8]	18	64.3 [44.9, 79.9]	0.058
No formal system for monitoring retention in care	3	12.5 [3.9, 33.2]	4	16.0 [6.0, 36.4]	0	0	5	20.0 [8.4, 40.7]	3	12.0 [3.8, 32.1]	5	17.9 [7.5, 37.0]	0.351
How clients needing repeat testing are traced													
Using phone call	16	66.7 [45.5, 82.7]	16	64.0 [43.4, 80.5]	22	88.0 [67.9, 96.2]	22	88.0 [67.9, 96.2]	21	84.0 [63.6, 94.0]	23	82.1 [63.0, 92.5]	0.128
Using lay/TB counsellors/DOTS	9	37.5 [20.4, 58.4]	16	64.0 [43.4, 80.5]	15	60.0 [39.7, 77.4]	12	48.0 [29.2, 67.4]	4	16.0 [6.0, 36.4]	10	35.7 [20.1, 55.1]	**0.007**
Blood samples collected daily from the facility	24	100	21	87.5 [66.8, 96.1]	23	95.8 [74.5, 99.4]	25	100	25	100	25	89.3 [70.9, 96.6]	0.072
Turnaround times for results between facility and laboratory from day of blood draw													
7 days or less for CD4 count - RECALL	23	95.8 [74.5, 99.4]	24	96.0 [75.4, 99.5]	23	92.0 [72.2, 98.1]	24	96.0 [75.4, 99.5]	25	100	27	96.4 [77.7, 99.5]	0.803
7 days or less for infant birth PCR - RECALL	23	95.8 [74.5, 99.4]	21	84.0 [63.6, 94.0]	20	80.0 [59.3, 91.6]	19	76.0 [55.2, 89.1]	16	64.0 [43.4, 80.5]	21	75.0 [55.5, 87.8]	**0.046**
7 days or less for other infant PCR - RECALL	22	91.7 [71.2, 98.0]	22	88.0 [67.9, 96.2]	19	76.0 [55.2, 89.1]	23	92.0 [72.2, 98.1]	20	80.0 [59.3, 91.6]	24	85.7 [66.9, 94.7]	0.506
7 days or less for maternal VL-RECALL	22	91.7 [71.2, 98.0]	22	88.0[67.9, 96.2]	21	84.0 [63.6, 94.0]	24	96.0 [75.4, 99.5]	24	96.0 [75.4, 99.5]	28	100	0.579
7 days or less for maternal VL- in all 5 random patient records	17	70.8 [49.5, 85.7]	14	56.0 [36.1, 74.1]	12	48.0 [29.2, 67.4]	13	52.0 [32.6, 70.8]	19	76.0 [55.2, 89.1]	18	64.3 [44.9, 79.9]	0.272
Turnaround times for results back to mother from the day of blood draw													
7 days or less for any infant PCR	18	75.0 [53.7, 88.6]	21	84.0 [63.6, 94.0]	17	68.0 [47.2, 83.5]	17	68.0 [47.2, 83.5]	15	60.0 [39.7, 77.4]	22	78.6 [59.2, 90.3]	**0.009**

CI-confidence intervals; SD-Standard Deviation; EC-Eastern Cape; GP-Gauteng; KZN-KwaZulu-Natal; LP-Limpopo; MP-Mpumalanga; NW-North West

3.2.2.5 Integration between services and referral into ART care postnatally

Integration between ANC, PMTCT, and Family Planning services was being done in almost all facilities across the districts (Table 14). More than 80% of the facilities reported that the same provider does ANC and issues ARVs for PMTCT mothers, and that pregnant women continue to get

their ARVs from the same ARV clinic during pregnancy and after delivery. Same provider issuing ARVs and providing family planning was lower is GP (69.6%) compared to the five other provinces whose family planning services in facilities were ≥80.0%. Tracing of clients who did not return for their monthly ARV supplies was low across all districts. A very low number were traced by lay counsellors. The most common method used to trace clients who did not return to monthly ARV supplies was through telephone calls.

Table 14: Integration between services and referral into ART care postnatally - findings from PMTCT Option B+ Evaluation in South Africa 2018

District (N=all facilities in evaluation)	**EC_ORTambo (n=24)**		**GP_Ekurhuleni (n=25)**		**KZN_eThekwini (n=25)**		**LP_GSekhukhune (n=25)**		**MP_Ehlanzeni (n=25)**		**NW_Bojanala (n=28)**		**p-value**
	n	**% (95% CI)**	**n**	**% (95% CI)**	**n**	**% (95% CI)**	**n**	**% (95% CI)**	**n**	**% (95% CI)**	**n**	**% (95% CI)**	
Same provider does ANC and issues ARVs for PMTCT mothers	21	87.5 [66.8, 96.1]	25	100	23	95.8 [74.5, 99.4]	25	100	24	96.0 [75.4, 99.5]	26	92.9 [74.8, 98.3]	0.285
Pregnant women continue to get their ARVs from the same ARV clinic during pregnancy and after delivery	21	87.5 [66.8, 96.1]	23	95.8 [74.5, 99.4]	23	95.8 [74.5, 99.4]	25	100	24	96.0 [75.4, 99.5]	26	92.9 [74.8, 98.3]	**0.349**
Same provider issues ARVs and Family planning	21	87.5 [66.8, 96.1]	16	69.6 [47.8, 85.1]	23	95.8 [74.5, 99.5]	25	100	20	80.0 [59.3, 91.6]	24	85.7 [66.9, 94.7]	**0.030**
How clients who do not return for their monthly ARV supplies are traced? (multiple responses allowed)													
Lay counsellor traces client	9	37.5 [20.4, 58.4]	10	40.0 [22.6, 60.3]	14	56.0 [36.1, 74.1]	0		2	8.0 [1.9, 27.8]	9	32.1 [17.3, 51.7]	**<0.0001**
DOTS/TB counsellor does tracing	1	4.2 [0.6, 25.5]	10	40.0 [22.6, 60.3]	6	24.0 [10.9, 44.8]	15	60.0 [39.7, 77.4]	1	4.0 [0.5, 24.6]	7	25.0 [12.2, 44.5]	**<0.0001**
Telephone call to client	15	62.5 [41.6, 79.6]	16	64.0 [43.4, 80.5]	21	84.0 [63.6, 94.0]	21	84.0 [63.6, 94.0]	22	88.0 [67.9, 96.2]	23	82.1 [63.0, 92.5]	0.114

CI-confidence intervals; SD-Standard Deviation; EC-Eastern Cape; GP-Gauteng; KZN-KwaZulu-Natal; LP-Limpopo; MP-Mpumalanga; NW-North West

IMPLICATIONS FOR PROGRAMMES

In Bojanala district, more than a quarter of the facilities did not have the 2015 PMTCT guideline and National Contraception and Fertility Planning Policy and Service Delivery Guidelines. This could limit healthcare providers access to information on provision of family planning services to women in need. Providing women with access to safe and effective contraception is a critical element of women's health. About one third of young South African women are HIV positive, and contraceptive provision and fertility advice should be take this into account. Contraception is one of the World Health Organization's four strategic prongs for the prevention of mother-to-child transmission of HIV. Contraception and planning for conception contributes to the reduction of HIV transmission, thereby supporting the National Strategic Plan on HIV, STIs and TB [14]. In view of the PMTCT guidelines, it is essential for facilities to have adequate supply of contraception for mothers.

Cross sectional registers for routine data capturing were the least available register in facilities. Cross sectional registers were introduced for all programs. So, there may be two possible reasons as to why provinces/facilities did not attain a 100% use of these registers. The register may have been out of stock. Facilities usually make copies of register in singular pages, which may not have been seen as a full book/register by data collectors or some facilities may still be using the old ANC longitudinal register which is no longer approved by DOH.

Some of the facilities in Ekurhuleni and Bojanala had a low supply of Benzathine penicillin, which is needed for treatment of syphilis in pregnancy. It was reported that there was a supply problem in these provinces which has since been resolved. Ehlanzeni had the lowest percentage of facilities with cotrimoxazole tablets which is needed for preventing opportunistic infections in HIV-infected individuals, whilst OR Tambo had the lowest for nevirapine tablets. It is important to ensure that facilities have adequate supplies and equipment for provision of MCH and PMTCT services.

3.2.3 Mothers' experiences of MCH care in the context of PMTCT Option B+ (combined analysis of all six districts)

The following section provides an overview of the sample realization, the sociodemographic profile and socioeconomic status of mothers by strata (4-14 weeks maternal HIV positive, 4-14 weeks maternal HIV negative, 6-12 months maternal HIV positive and 6-12 months maternal HIV negative (across all 6 districts). Detailed results per district are presented in Appendix 10.

3.2.3.1 Sample Realization

Table 15 shows the desired as well as attained sample size from mothers who consented to participate in the evaluation in the six sampled districts. Three districts (Greater Sekhukhune, Ehlanzeni and Bojanala) in the 4-14-week HIV-unexposed group and one district (eThekwini) in 4-14 weeks HIV-exposed group, attained more than 70% sample size. Over 70% sample realization was observed in all districts for the 6-12 months HIV-unexposed group and in two (eThekwini and Ehlanzeni) for the 6-12 months HIV exposed group.

Table 15: Desired and actual sample size by district – findings from PMTCT Option B+ Evaluation in South Africa 2018

District	Overall sample Desired N per district = 480	Strata Desired N per strata = 120 Actual n per strata (% realization)			
	Actual (% realization)	4-14 weeks mHIV+	4-14 weeks mHIV-	6-12 months mHIV+	6-12 months mHIV-
EC - OR Tambo	321 (67)	52 (43)**	75 (63)	77 (64)	117 (98)
GP - Ekurhuleni	273 (57)	62 (52)*	73 (61)	47 (39)**	91 (76)
KZN - eThekwini	385 (80)	88 (73)	81 (68)	109 (91)	107 (89)
LP - Greater Sekhukhune	399 (83)	64 (53)*	113 (94)	63 (53)*	159 (133)
MP - Ehlanzeni	355 (74)	69 (58)*	89 (74)	85 (71)	112 (93)
NW - Bojanala	339 (71)	63 (53)*	92 (77)	74 (62)	110 (92)

*Sample realization below **50% or between *50% and 60% and could affect the confidence intervals of some of the estimates. EC = Eastern Cape; GP = Gauteng; KZN –KwaZulu Natal; LP=Limpopo; MP=Mpumalanga; NW = North West. N=total number; mHIV+ = mother HIV positive; mHIV- = mother HIV negative*

3.2.3.2 Sample Description and Characteristics

Table 16 describes the sociodemographic characteristics of mothers by district and strata (4-14 weeks and 6-12 months HIV exposed and unexposed).

Age: The median age of mothers in all districts across strata (4-14 weeks and 6-12 months HIV exposed and unexposed) was >24 years. The exception was the 6-12 months HIV unexposed group in eThekwini where the median age was 23.2 years.

Infant's gender: There was an even distribution of infant boys to girls in both the 4-14 week and 6-12 months exposed and unexposed groups in all districts.

Maternal education: The majority of sampled mothers had high school education (above 70%). OR Tambo has the highest (23.4%) proportion of mothers with primary education in the

6-12 months HIV-exposed group, and lowest (2.6%) proportion of mothers with tertiary education in the same group.

Marital Status: More than 50% mothers reported their marital status as single across all districts. More than 80% of mothers in all strata in eThekwini reported that they were single.

Table 16: Socio-demographic characteristics of interviewed mother-baby pairs - – findings from PMTCT Option B+ Evaluation in South Africa 2018

Characteristics	Categories	EC_ORTambo (n=320)	GP_Ekurhuleni (n=271)	KZN_eThekwini (n=384)	LP_GSekhukhune (n=399)	MP_Ehlanzeni (n=355)	NW_Bojanala (n=339)
Maternal Age, median(SD)	4-14w mHIV+	29.7 (6.1)	31.1 (5.4)	28.1 (6.3)	31.3 (5.8)	30.3 (6.2)	30.5 (6.4)
	4-14w mHIV-	25.3 (6.6)	27.0 (5.4)	24.6 (5.7)	26.9 (6.9)	26.1 (6.6)	27.0 (6.6)
	6-12m mHIV+	29.5 (5.4)	32.5 (6.5)	28.7 (5.4)	31.4 (5.7)	30.5 (5.5)	29.7 (6.4)
	6-12m mHIV-	25.5 (6)	27.9 (5.8)	23.2 (5.1)	28.1 (6.3)	25.7 (5.9)	27.2 (6.2)
Infant's sex % [95% CI]	**Boys**						
	4-14w mHIV+	45.1 [34.9,55.7]	57.4 [43.7,70.0]	47.7 [37.4,58.3]	50.0 [35.9,64.1]	58.0 [46.5,68.7]	52.4 [40.3,64.2]
	4-14w mHIV-	46.7 [34.9,58.9]	50.0 [38.5,61.5]	55.6 [43.3,67.2]	50.4 [40.8,60.0]	49.4 [41.7,57.2]	43.5 [33.9,53.6]
	6-12m mHIV+	44.2 [33.9,54.9]	44.7 [29.2,61.3]	50.9 [43.5,58.3]	47.6 [36.4,59.1]	50.6 [40.5,60.7]	45.9 [36.0,56.2]
	6-12m mHIV-	48.7 [43.1,54.4]	48.4 [37.4,59.4]	47.7 [35.5,60.1]	49.1 [41.6,56.6]	50.9 [43.1,58.6]	44.5 [34.4,55.1]
	Girls						
	4-14w mHIV+	54.9 [44.3,65.1]	42.6 [30.0,56.3]	52.3 [41.7,62.6]	50.0 [35.9,64.1]	42.0 [31.3,53.5]	47.6 [35.8,59.7]
	4-14w mHIV-	53.3 [41.1,65.1]	50.0 [38.5,61.5]	44.4 [32.8,56.7]	49.6 [40.0,59.2]	50.6 [42.8,58.3]	56.5 [46.4,66.1]
	6-12m mHIV+	55.8 [45.1,66.1]	55.3 [38.7,70.8]	49.1 [41.7,56.5]	52.4 [40.9,63.6]	49.4 [39.3,59.5]	54.1 [43.8,64.0]
	6-12m mHIV-	51.3 [45.6,56.9]	51.6 [40.6,62.6]	52.3 [39.9,64.5]	50.9 [43.4,58.4]	49.1 [41.4,56.9]	55.5 [44.9,65.6]
	p-value	p=0.894	p=0.559	p=0.713	p=0.983	p=0.598	p=0.677
Maternal Education % [95% CI]	**Primary**						
	4-14w mHIV+	3.8 [0.9,14.8]	4.8 [1.7,12.9]	9.1 [4.3,18.2]	10.9 [5.2,21.7]	10.1 [4.6,20.8]	7.9 [3.7,16.3]
	4-14w mHIV-	9.3 [5.4,15.8]	5.5 [2.3,12.6]	2.5 [0.3,15.6]	4.5 [1.3,14.6]	12.5 [5.8,24.8]	5.4 [1.5,17.4]
	6-12m mHIV+	23.4 [15.7,33.4]	8.5 [3.9,17.5]	12 [6.5,21.3]	9.5 [3.3,24.2]	14.1 [9.2,21.0]	14.9 [8.1,25.6]
	6-12m mHIV-	6.8 [3.5,13.0]	6.6 [3.4,12.5]	4.7 [2.1,10.5]	4.4 [2.1,9.2]	8.0 [4.2,14.9]	14.5 [8.6,23.6]
	High school						
	4-14w mHIV+	78.8 [65.4,88.0]	90.3 [79.3,95.8]	84.1 [75.4,90.1]	82.8 [74.3,88.9]	85.5 [74.1,92.4]	88.9 [79.2,94.4]
	4-14w mHIV-	76.0 [62.7,85.6]	71.2 [59.5,80.7]	92.6 [79.9,97.5]	81.3 [68.4,89.7]	76.1 [63.9,85.2]	84.8 [71.5,92.5]
	6-12m mHIV+	74.0 [64.8,81.5]	83.0 [72.4,90.0]	83.3 [73.7,89.9]	82.5 [69.0,90.9]	82.4 [73.2,88.8]	81.1 [70.1,88.7]
	6-12m mHIV-	87.2 [81.2,91.5]	83.5 [74.9,89.6]	89.6 [83.2,93.8]	85.5 [77.6,91.0]	83.0 [74.2,89.3]	78.2 [67.1,86.3]
	Tertiary						
	4-14w mHIV+	17.3 [8.8,31.3]	4.8 [1.6,13.4]	6.8 [3.3,13.4]	6.3 [2.7,13.8]	4.3 [1.4,12.6]	3.2 [0.9,10.4]

Characteristics	Categories	EC_ORTambo (n=320)	GP_Ekurhuleni (n=271)	KZN_eThekwini (n=384)	LP_GSekhukhune (n=399)	MP_Ehlanzeni (n=355)	NW_Bojanala (n=339)
	4-14w mHIV-	14.7 [7.1,27.8]	23.3 [14.1,36.0]	4.9 [2.0,11.7]	14.3 [7.3,26.2]	11.4 [6.3,19.5]	9.8 [4.4,20.4]
	6-12m mHIV+	2.6 [0.7,9.7]	8.5 [2.7,23.4]	4.6 [2.1,10.0]	7.9 [3.5,17.0]	3.5 [1.1,10.7]	4.1 [1.4,11.5]
	6-12m mHIV-	6.0 [3.0,11.6]	9.9 [4.5,20.5]	5.7 [2.9,10.7]	10.1 [6.1,16.2]	8.9 [5.2,14.8]	7.3 [3.6,14.2]
	p-value	**p=<0.0001**	**p=0.047**	p=0.274	p=0.278	p=0.257	p=0.222
Maternal Marital status f% [95% CI]	**Single**						
	4-14w mHIV+	66.7 [56.0,75.9]	66.1 [53.4,76.9]	85.2 [76.7,91.0]	53.1 [40.4,65.5]	69.6 [55.6,80.7]	50.8 [36.7,64.8]
	4-14w mHIV-	73.3 [63.2,81.5]	56.9 [46.7,66.6]	82.5 [70.5,90.3]	69.6 [61.2,76.9]	73.9 [59.2,84.6]	62.0 [49.4,73.1]
	6-12m mHIV+	71.4 [57.2,82.4]	44.4 [27.5,62.8]	89.8 [81.7,94.6]	61.3 [47.8,73.2]	65.9 [54.4,75.8]	68.9 [54.1,80.7]
	6-12m mHIV-	71.8 [63.8,78.6]	53.8 [39.9,67.3]	86.9 [76.5,93.1]	71.7 [64.4,78.0]	67.0 [54.9,77.2]	62.7 [53.8,70.8]
	Married						
	4-14w mHIV+	17.6 [10.0,29.1]	12.9 [5.7,26.5]	8.0 [3.5,17.0]	15.6 [8.7,26.4]	2.9 [0.8,10.3]	6.3 [2.2,17.3]
	4-14w mHIV-	22.7 [14.7,33.3]	23.6 [14.2,36.5]	7.5 [3.2,16.5]	15.2 [9.6,23.2]	9.1 [3.5,21.4]	17.4 [10.4,27.7]
	6-12m mHIV+	16.9 [10.1,26.9]	20.0 [10.5,34.8]	0.0	17.7 [9.7,30.2]	11.8 [5.9,22.2]	10.8 [4.5,24.0]
	6-12m mHIV-	19.7 [14.1,26.7]	17.6 [10.6,27.8]	8.4 [3.8,17.7]	15.7 [11.9,20.5]	8.0 [4.5,14.0]	11.8 [7.1,19.1]
	Co-habiting						
	4-14w mHIV+	11.8 [5.2,24.3]	21.0 [10.8,36.8]	6.8 [3.3,13.6]	31.3 [19.2,46.6]	27.5 [17.9,39.9]	42.9 [30.2,56.5]
	4-14w mHIV-	2.7 [0.7,9.1]	19.4 [12.7,28.7]	10.0 [4.4,21.3]	15.2 [8.8,25.0]	17.0 [10.3,26.8]	19.6 [13.0,28.4]
	6-12m mHIV+	11.7 [6.2,20.9]	35.6 [21.8,52.2]	9.3 [4.9,16.7]	17.7 [9.7,30.2]	21.2 [12.8,32.9]	20.3 [11.2,33.8]
	6-12m mHIV-	6.8 [2.9,15.4]	27.5 [18.7,38.5]	4.7 [1.7,12.3]	12.6 [8.1,19.0]	25.0 [16.9,35.3]	25.5 [17.3,35.7]
	Widowed						
	4-14w mHIV+	3.9 [1.0,14.0]	0.0	0.0	0.0	0.0	0.0
	4-14w mHIV-	1.3 [0.2,8.2]	0.0	0.0	0.0	0.0	1.1 [0.2,7.0]
	6-12m mHIV+	0.0	0.0	0.9 [0.1,6.1]	3.2 [0.9,11.3]	1.2 [0.2,8.2]	0.0
	6-12m mHIV-	1.7 [0.4,6.4]	1.1 [0.2,7.4]	0.0	0.0	0.0	0.0
	p-value	p=0.323	p=0.446	p=0.186	**p=<0.0001**	p=0.475	**p=0.016**

Key: EC_ORTambo: Eastern Cape, OR Tambo District Municipality; GP_Ekurhuleni: Gauteng, Ekurhuleni Metropolitan Municipality; KZN_eThekwini: KwaZulu-Natal, eThekwini Metropolitan Municipality; LP_GSekhukhune: Limpopo, Greater Sekhukhune District Municipality; MP_Ehlanzeni: Mpumalanga, Ehlanzeni District Municipality; NW_Bojanala: North West, Bojanala Platinum District Municipality mHIV+: maternal HIV positive; mHIV-: maternal HIV negative

3.2.3.3 Socio-economic Status:

Socio-economic status (SES) was categorized into high and low. At least two thirds of participants in Ekurhuleni and eThekwini ranked within the high SES group while the opposite was true for OR Tambo and Greater Sekhukhune, where only around a third were in the high SES (Table 17). Ehlanzeni and Bojanala had just over 40% of the participants falling within the high SES group.

Table 17: Sample socio-economic status by district - – findings from PMTCT Option B+ Evaluation in South Africa 2018

	SES groups	n	%
Overall evaluation sample	**high**	**1027**	**49.6**
	low	**1045**	**50.4**
EC - OR Tambo	high	94	29.3
	low	227	70.7
GP - Ekurhuleni	high	224	82.1
	low	49	17.9
KZN - eThekwini	high	265	68.8
	low	120	31.2
LP - Greater Sekhukhune	high	136	34.1
	low	263	65.9
MP - Ehlanzeni	high	150	42.3
	low	205	57.7
NW - Bojanala	high	158	46.6
	low	181	53.4

Key: EC_ORTambo: Eastern Cape, OR Tambo District Municipality; GP_Ekurhuleni: Gauteng, Ekurhuleni Metropolitan Municipality; KZN_eThekwini: KwaZulu-Natal, eThekwini Metropolitan Municipality; LP_GSekhukhune: Limpopo, Greater Sekhukhune District Municipality; MP_Ehlanzeni: Mpumalanga, Ehlanzeni District Municipality; NW_Bojanala: North West, Bojanala Platinum District Municipality

The sample size was calculated to provide estimates of four key indicators that reflected critical activities along the PMTCT cascade, namely, (i) planned pregnancy and contraception use; (ii) re-testing of HIV negative women, (iii) immediate ART initiation of HIV positive women, and (iv) infant HIV testing coverage and infant feeding.

3.2.3.4 Planned pregnancy

Unplanned pregnancy was higher across all strata in OR Tambo, eThekwini (Table 18). There was no significant difference between HIV positive and HIV negative mothers who planned their last pregnancies.

Table 18: Planned pregnancy -– findings from PMTCT Option B+ Evaluation in South Africa 2018

Province	Categories	Planned % (95% confidence interval)	Unplanned % (95% confidence interval)	p-value
EC_ORTambo (n=321)	4-14w mHIV+	42.3 [29.4,56.3]	57.7 [43.7,70.6]	0.670
	4-14w mHIV-	38.7 [29.2,49.0]	61.3 [51.0,70.8]	
	6-12m mHIV+	36.4 [27.9,45.8]	63.6 [54.2,72.1]	0.723
	6-12m mHIV-	38.5 [30.1,47.6]	61.5 [52.4,69.9]	
GP_Ekurhuleni (n=272)	4-14w mHIV+	40.3 [29.2,52.5]	59.7 [47.5,70.8]	0.081
	4-14w mHIV-	53.4 [43.3,63.3]	46.6 [36.7,56.7]	
	6-12m mHIV+	56.5 [43.6,68.6]	43.5 [31.4,56.4]	0.849
	6-12m mHIV-	54.9 [43.1,66.3]	45.1 [33.7,56.9]	
KZN_eThekwini (n=384)	4-14w mHIV+	33.0 [22.9,44.8]	67.0 [55.2,77.1]	0.581
	4-14w mHIV-	29.6 [21.1,39.9]	70.4 [60.1,78.9]	
	6-12m mHIV+	32.4 [23.6,42.7]	67.6 [57.3,76.4]	0.452
	6-12m mHIV-	27.1 [17.7,39.1]	72.9 [60.9,82.3]	
LP_GSekhukhune (n=398)	4-14w mHIV+	51.6 [39.0,64.0]	48.4 [36.0,61.0]	0.782
	4-14w mHIV-	49.6 [42.4,56.7]	50.4 [43.3,57.6]	
	6-12m mHIV+	56.5 [43.4,68.7]	43.5 [31.3,56.6]	0.312
	6-12m mHIV-	64.2 [56.8,70.9]	35.8 [29.1,43.2]	
MP_Ehlanzeni (n=355)	4-14w mHIV+	60.9 [49.9,70.9]	39.1 [29.1,50.1]	0.525
	4-14w mHIV-	56.2 [43.9,67.8]	43.8 [32.2,56.1]	
	6-12m mHIV+	64.7 [53.8,74.3]	35.3 [25.7,46.2]	0.447
	6-12m mHIV-	59.8 [49.2,69.6]	40.2 [30.4,50.8]	
NW_Bojanala (n=338)	4-14w mHIV+	42.9 [31.0,55.6]	57.1 [44.4,69.0]	0.545
	4-14w mHIV-	47.8 [39.5,56.3]	52.2 [43.7,60.5]	
	6-12m mHIV+	43.8 [31.1,57.4]	56.2 [42.6,68.9]	0.159
	6-12m mHIV-	56.4 [46.2,66.0]	43.6 [34.0,53.8]	

EC = Eastern Cape; GP = Gauteng; KZN –KwaZulu Natal; LP=Limpopo; MP=Mpumalanga; NW = North West. N=total number; mHIV+ = mother HIV positive; mHIV- = mother HIV negative

3.2.3.5 Postpartum family planning use

Table 19 presents information on the proportion of mothers who were using any kind of contraception at the time of interview. HIV-negative mothers in the 4-14-week strata (55.4%) in Bojanala had the lowest percentage of family planning use postpartum. HIV-positive mothers in the 6-12-month strata (69.9%) in Bojanala also had lowest percentage of family planning use postpartum. In OR Tambo, HIV-negative mothers in the 6-12-month strata (69.2%) reported the lowest percentage of family planning use postpartum.

Table 19: Proportion of mothers currently using any family planning method - – findings from PMTCT Option B+ Evaluation in South Africa 2018

	4-14w mHIV+		4-14w mHIV-		6-12m mHIV+		6-12m mHIV-	
	n	% (95% CI)	n	% (95% CI)	n	% (95% CI)	n	% (95% CI)
EC_ORTambo	45	88.2 [77.2,94.3]	56	74.7 [63.2,83.5]	60	77.9 [69.0,84.8]	81	69.2 [60.4,76.8]
GP_Ekurhuleni	58	93.5 [85.6,97.2]	55	75.3 [66.5,82.4]	35	74.5 [59.6,85.2]	72	79.1 [71.9,84.9]
KZN_eThekwini	70	80.5 [65.0,90.1]	63	77.8 [65.8,86.4]	95	88.0 [81.3,92.5]	88	82.2 [70.9,89.8]
LP_GSekhukhune	50	78.1 [66.1,86.8]	79	69.9 [59.8,78.4]	45	72.6 [58.5,83.2]	126	79.7 [72.1,85.7]
MP_Ehlanzeni	60	87.0 [78.1,92.6]	71	79.8 [72.0,85.8]	68	80.0 [69.6,87.5]	91	81.3 [70.9,88.5]
NW_Bojanala	44	71.0 [60.3,79.7]	51	55.4 [45.9,64.6]	51	69.9 [58.2,79.4]	83	75.5 [66.2,82.8]

EC = Eastern Cape; GP = Gauteng; KZN –KwaZulu Natal; LP=Limpopo; MP=Mpumalanga; NW = North West.
N=total number; mHIV+ = mother HIV positive; mHIV- = mother HIV negative

3.2.3.6 Maternal HIV testing (1st 90 of UNAIDS 90-90-90 target)

Figure 1 below describes the uptake of HIV testing in mothers who reported ever being tested during the latest pregnancy. More than 80 % of postpartum women in all districts reported they were tested for HIV prior to the latest pregnancy. Of the mothers that had been tested, the proportion who self-reported as HIV positive ranged from 24% in Greater Sekhukhune district to 41% in eThekwini.

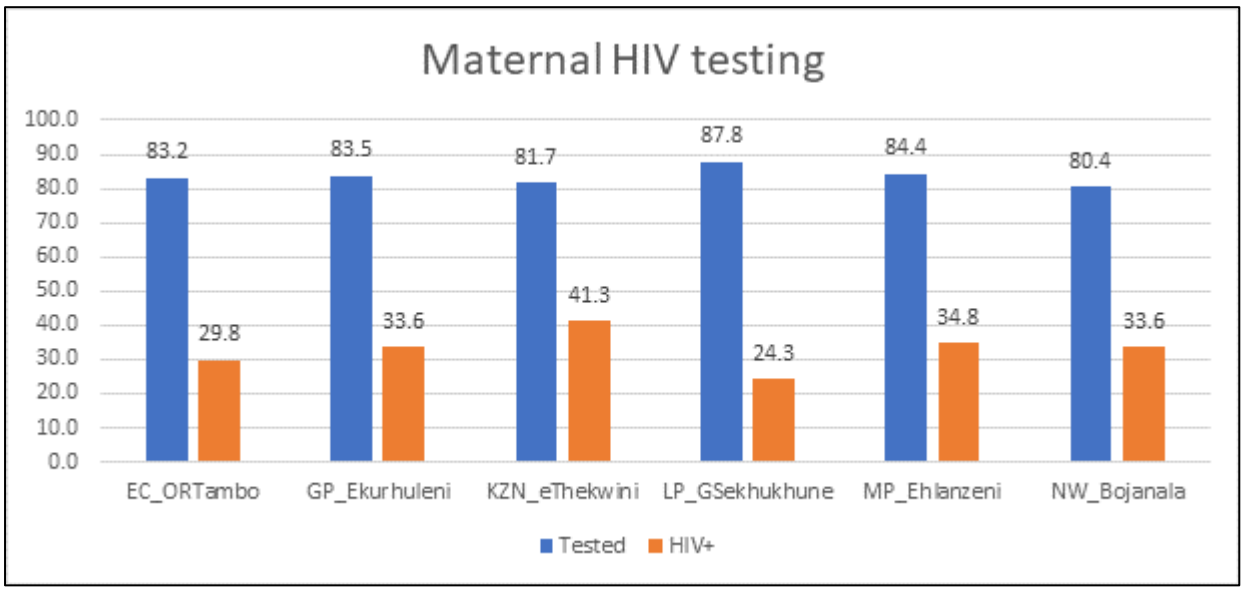

Figure 1: Uptake of HIV testing in mothers who reported ever been tested during the latest pregnancy – findings from PMTCT Option B+ Evaluation in South Africa 2018

EC = Eastern Cape; GP = Gauteng; KZN –KwaZulu Natal; LP=Limpopo; MP=Mpumalanga; NW = North West

3.2.3.7 HIV negative mothers who re-tested 3 monthly postpartum if still breastfeeding

In Greater Sekhukhune and Ekurhuleni, similarly to above, higher percentages of mothers in the 6-12 months strata reported not being tested every 3 months postpartum if still breastfeeding (Figure 2).

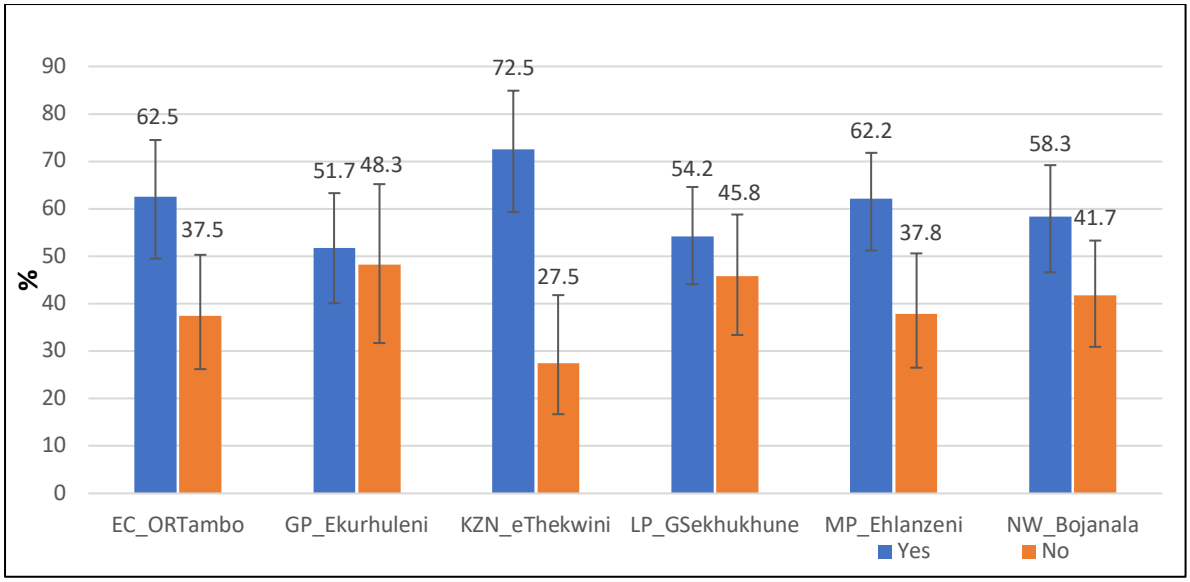

Figure 2: HIV negative mother re-tested every 3 months postpartum if still breastfeeding (6-12 months) - findings from PMTCT Option B+ Evaluation in South Africa 2018

EC = Eastern Cape; GP = Gauteng; KZN –KwaZulu Natal; LP=Limpopo; MP=Mpumalanga; NW = North West

3.2.3.8 ART initiated immediately following HIV diagnosis without waiting for blood test results (2nd 90 of UNAIDS 90-90-90 target for pregnant women)

The second 90 is defined as 90% of all people with diagnosed HIV infection receiving sustained antiretroviral therapy. However, in the context of Option B+ which is specific to specialized population (pregnant/BF women) immediate initiation of ART following HIV diagnosis is recommended. The proportion of mothers in the 4-14-week and 6-12 month stratas, who self-reported immediate ART initiation was sub-optimal. Less than 77% of the mothers in any district reported being initiated on ART immediately. This is below the 90% target for this indicator.

Table 20: ART initiated immediately following HIV diagnosis without waiting for blood test results – findings from PMTCT Option B+ Evaluation in South Africa 2018

Province_District	Strata	Yes		No		Don't know	
		n	% (95%CI)	n	% (95%CI)	n	% (95%CI)
EC - OR Tambo	4-14 weeks mHIV+	31	63.3 [48.0,76.2]	18	36.7 [23.8,52.0]	0	0
	6-12 months mHIV+	46	60.5 [49.0,71.0]	30	39.5 [29.0,51.0]	0	0
GP – Ekurhuleni	4-14 weeks mHIV+	41	67.2 [56.6,76.3]	19	31.1 [22.6,41.2]	1	1.6 [0.2,10.9]
	6-12 months mHIV+	28	62.2 [50.3,72.8]	16	35.6 [24.7,48.1]	1	2.2 [0.3,14.6]
KZN - eThekwini	4-14 weeks mHIV+	61	70.1 [59.8,78.7]	26	29.9 [21.3,40.2]	0	0
	6-12 months mHIV+	74	69.8 [61.5,77.0]	31	29.2 [22.0,37.7]	1	0.9 [0.1,6.7]
LP - Greater Sekhukhune	4-14 weeks mHIV+	36	61.0 [46.3,73.9]	23	39.0 [26.1,53.7]	0	0
	6-12 months mHIV+	43	71.7 [57.4,82.6]	17	28.3 [17.4,42.6]	0	0
MP – Ehlanzeni	4-14 weeks mHIV+	51	76.1 [67.5,83.0]	15	22.4 [15.7,30.8]	1	1.5 [0.2,10.5]
	6-12 months mHIV+	60	72.3 [63.4,79.7]	22	26.5 [19.4,35.1]	1	1.2 [0.2,7.4]
NW – Bojanala	4-14 weeks mHIV+	45	75.0 [63.3,83.9]	15	25.0 [16.1,36.7]	0	0
	6-12 months mHIV+	48	68.6 [57.2,78.1]	21	30.0 [20.4,41.7]	1	1.4 [0.2,9.5]

EC = Eastern Cape; GP = Gauteng; KZN –KwaZulu Natal; LP=Limpopo; MP=Mpumalanga; NW = North West. N=total number; mHIV+ = mother HIV positive; mHIV- = mother HIV negative

3.2.3.9 Coverage of viral load testing and prevalence of viral load failure

A total of 733/853 (85.9%) HIV-positive women reported that they had received a viral load test since ART initiation. Of the 733 who had a viral load test, 77.9% reported that their viral load results were explained to them at collection of results, and 9.6% could recall their viral load. Of the 82 who could recall their viral load, the majority (73.2%) reported a viral load ≥1000 copies/ml. Overall, the self-reported viral load ranged between 0 and 594000 copies/ml (i.e. 0 and 13.3 $\log_{10}$ viral load copies), with a median (and interquartile range) of 2000 (720;6000), (i.e., 7.6 (6.5;8.7) $\log_{10}$ viral load copies). Exactly 50% of HIV-positive women who could recall their viral load were in each postnatal age-group with equal median viral load *(results not presented).*

3.2.3.10 Infant HIV Testing Coverage

Birth testing in both the 4-14 week and 6-12-month strata was >70% in all districts except Greater Sekhukhune and Bojanala (Table 21).

Table 21: Infant HIV testing coverage as reported in the infants Road to Health Book - – findings from PMTCT Option B+ Evaluation in South Africa 2018

Province **District**	**EC** **OR Tambo**	**GP** **Ekurhuleni**	**KZN** **eThekwini**	**LP** **G Sekhukhune**	**MP** **Ehlanzeni**	**NW** **Bojanala**	
	95% CI	**95% CI**	**95% CI**	**95% CI**	**95% CI**	**95% CI**	**p-value**
Strata==1 [4-14w; mHIV+] (n=375)							
Birth	81.6 [68.6,90.1]	73.7 [62.3,82.6]	84.3 [74.0,91.1]	66.1 [52.8,77.3]	77.3 [65.1,86.1]	56.9 [41.0,71.4]	p=0.279
6 weeks	32.7 [21.0,47.0]	45.6 [33.6,58.2]	19.3 [11.9,29.7]	27.9 [19.3,38.4]	30.3 [17.6,46.9]	34.5 [20.9,51.2]	**p=0.006**
10 weeks	4.1 [1.1,13.7]	17.5 [7.8,34.8]	24.1 [17.1,32.8]	4.8 [1.7,13.0]	24.2 [16.6,34.0]	17.5 [10.8,27.2]	**p=0.005**
Strata==3 [6-12m; mHIV+] (n=427)							
Birth	78.9 [63.5,89.0]	72.5 [55.2,85.0]	89.5 [82.2,94.0]	68.9 [58.8,77.4]	81.3 [68.7,89.5]	60.0 [43.8,74.3]	**p=0.017**
6 weeks	64.5 [54.3,73.5]	65.0 [53.4,75.1]	60.6 [49.2,70.9]	59.0 [48.9,68.5]	66.3 [54.0,76.7]	46.2 [30.6,62.5]	**p=0.001**
10 weeks	43.4 [32.8,54.7]	50.0 [33.8,66.2]	61.0 [44.9,74.9]	41.0 [30.5,52.4]	42.5 [32.3,53.4]	44.6 [32.3,57.6]	**p=0.025**
16-18 weeks	27.6 [17.9,40.1]	28.2 [19.3,39.2]	21.9 [13.8,33.0]	14.8 [8.6,24.1]	13.8 [7.8,23.0]	12.3 [4.5,29.7]	**p=0.003**

EC = Eastern Cape; GP = Gauteng; KZN –KwaZulu Natal; LP=Limpopo; MP=Mpumalanga; NW = North West. N=total number; mHIV+ = mother HIV positive; mHIV- = mother HIV negative

3.2.3.11 Infant Feeding

Across all the six districts and the exposure group, the proportion of mothers who intended to EBF at birth was higher than the proportion who were practicing EBF at the time of interview at 4-14 weeks (Figure 3a and 3b). In Bojanala, 87.7% of mothers reported EBF at birth whilst only 49.2% were actually practising at the time of interview.

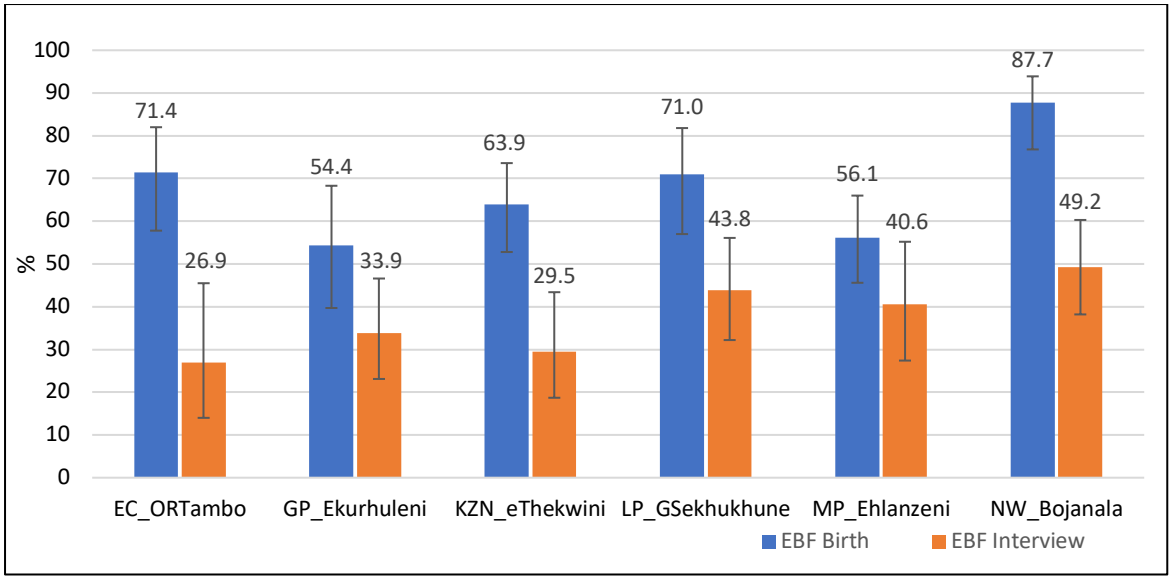

Figure 2a: Exclusive breastfeeding (EBF) coverage: reported intention at birth and actual practice at time of interview amongst infants (4-14 weeks) with self-reported HIV positive mothers - – findings from PMTCT Option B+ Evaluation in South Africa 2018

EC = Eastern Cape; GP = Gauteng; KZN –KwaZulu Natal; LP=Limpopo; MP=Mpumalanga; NW = North West. EBF" Exclusive breastfeeding

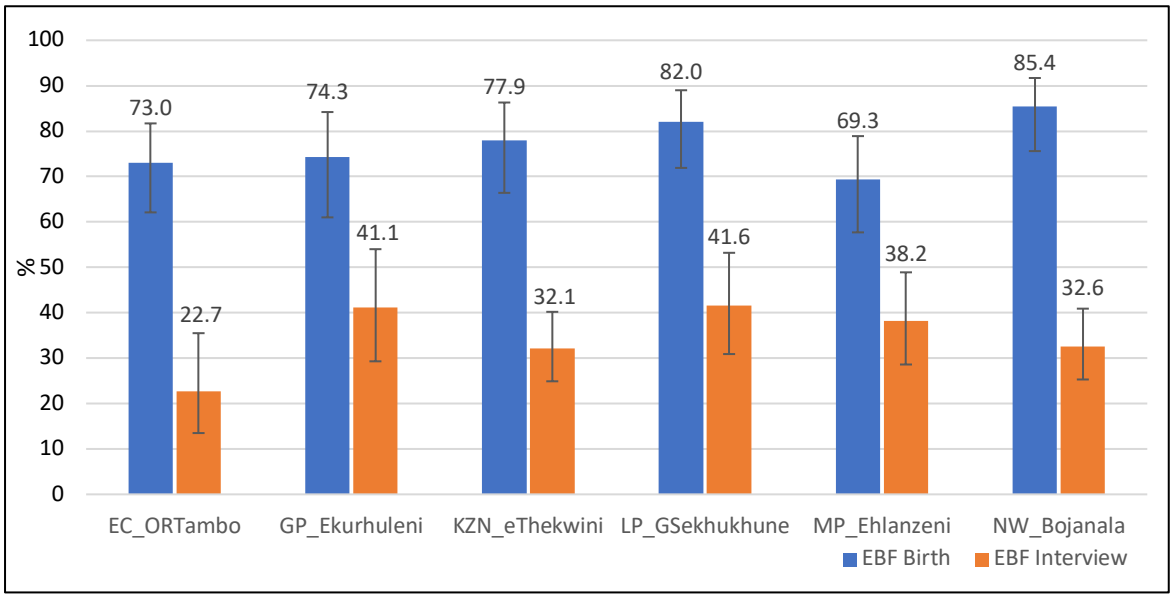

Figure 3b: Exclusive breastfeeding (EBF) coverage: reported intention at birth and actual practice at time of interview amongst infants (4-14 weeks) with self-reported HIV negative mothers - findings from PMTCT Option B+ Evaluation in South Africa 2018

EC = Eastern Cape; GP = Gauteng; KZN –KwaZulu Natal; LP=Limpopo; MP=Mpumalanga; NW = North West

Across all the six districts and the exposure group, the proportion of mothers who intended to EBF at birth was greater than 50% in the 6-12-month strata (Figure 4a and 4b).

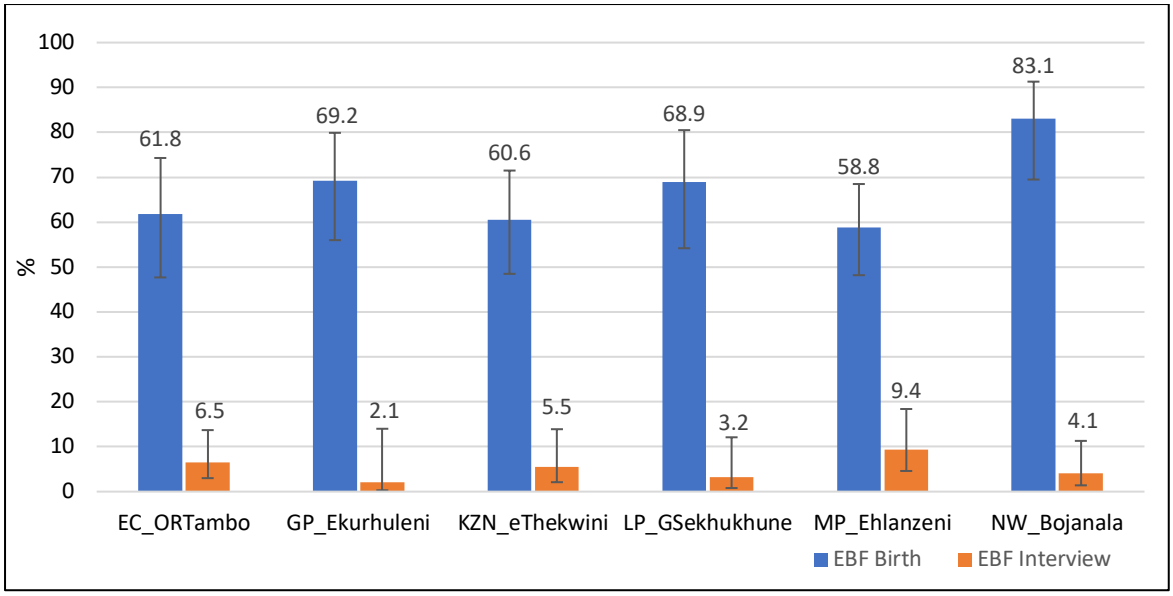

Figure 3a: Breastfeeding coverage: reported intention at birth and actual practice at time of interview amongst infants (6-12 months) with self-reported HIV positive mothers - findings from PMTCT Option B+ Evaluation in South Africa 2018

EC = Eastern Cape; GP = Gauteng; KZN –KwaZulu Natal; LP=Limpopo; MP=Mpumalanga; NW = North West. EBF = exclusive breastfeeding

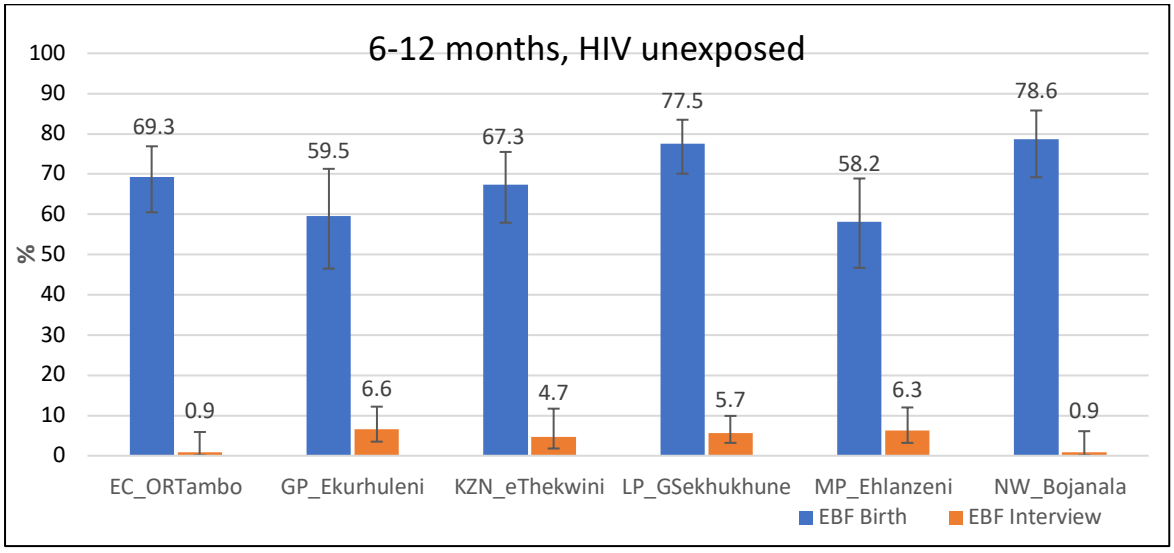

Figure 4b: Breastfeeding coverage: reported intention at birth and actual practice at time of interview amongst infants (6-12 months) with self-reported HIV negative mothers - – findings from PMTCT Option B+ Evaluation in South Africa 2018

EC = Eastern Cape; GP = Gauteng; KZN –KwaZulu Natal; LP=Limpopo; MP=Mpumalanga; NW = North West; EBF = exclusive breastfeeding

IMPLICATIONS FOR PROGRAMMES

- Unplanned pregnancy remains a major public health problem across the districts surveyed. Integration of family planning into ANC and PMTCT services and access to effective contraception methods postpartum should be strengthened across all districts, especially in Bojanala district.
- Regarding the 1st 90, uptake of HIV testing in mothers who reported ever being tested prior to the latest pregnancy was <90% in all districts. This means that targeted HIV testing of women should be prioritized prior to pregnancy. Early identification of HIV-positive women with subsequent immediate initiation of treatment will optimize programmes such as PMTCT.
- Immediate referral of newly diagnosed HIV-positive individuals should be prioritized to improve ART initiation.
- All healthcare personal should inquire about HIV status and treatment of every pregnant or lactating women and women of reproductive age. They should occur at every contact with the health services to avoid missed PMTCT opportunities
- Frequent retesting of HIV negative pregnant and breastfeeding women every 3 months and linking people into appropriate care should be strengthened. From the qualitative findings, mothers had good knowledge about the PMTCT programme; however, they did not receive any counselling services. These data show that mothers were informed about retesting, but this wasn't practiced by them, nor was there follow up by the health facility. Findings from the HCW interviews show that Knowledge of retesting every 12 weeks throughout breastfeeding was <50%, possibly explaining the lack of facility-level follow-up of HIV negative women for re-testing.
- The quantitative findings of infant feeding from the six districts were consistent with qualitative findings on breastfeeding practices where district officials mentioned that release of a national breastfeeding circular in 2016 was seen as good but confusing. Implementing partners felt that promotion of breastfeeding is crucial, whereas the majority of HCW felt that is should be promoted with caution since ART adherence and viral load suppression are not always achieved. HCW also expressed a concern for not being able to counsel/educate women on how to formula feed correctly since it is not a method that is not promoted.
- Efforts to provide effective infant feeding counselling need to scale up to ensure continued improvements in infant feeding practices

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4.0 EVALUATION LIMITATIONS

This evaluation was limited to an in-depth evaluation of six districts of South Africa. Thus, the results are not nationally representative. Since Option B+ was implemented >1-2 years ago, recall bias in qualitative interviews asking about health system readiness for Option B+ at the time of initial implementation may have affected data validity . Unintended pregnancy was measured from a single question, not a validated measure. Additionally, data reflect the views of women whose babies survived and who presented themselves for care at health facilities during the study period. By design we excluded women who had stillbirths or whose baby died or who do not present themselves to the facility for care. Some analyses were limited by the quality of the data collected from the RtHB. The evaluation focused on of processes of PMTCT Option B+ implementation with the aim to strengthen successes and identified PMTCT gaps. There were no interventions tested and this evaluation did not measure the impact of PMTCT Option B+.

5.0 EVALUATION COSTS

Total cost for this evaluation was $577,738.64

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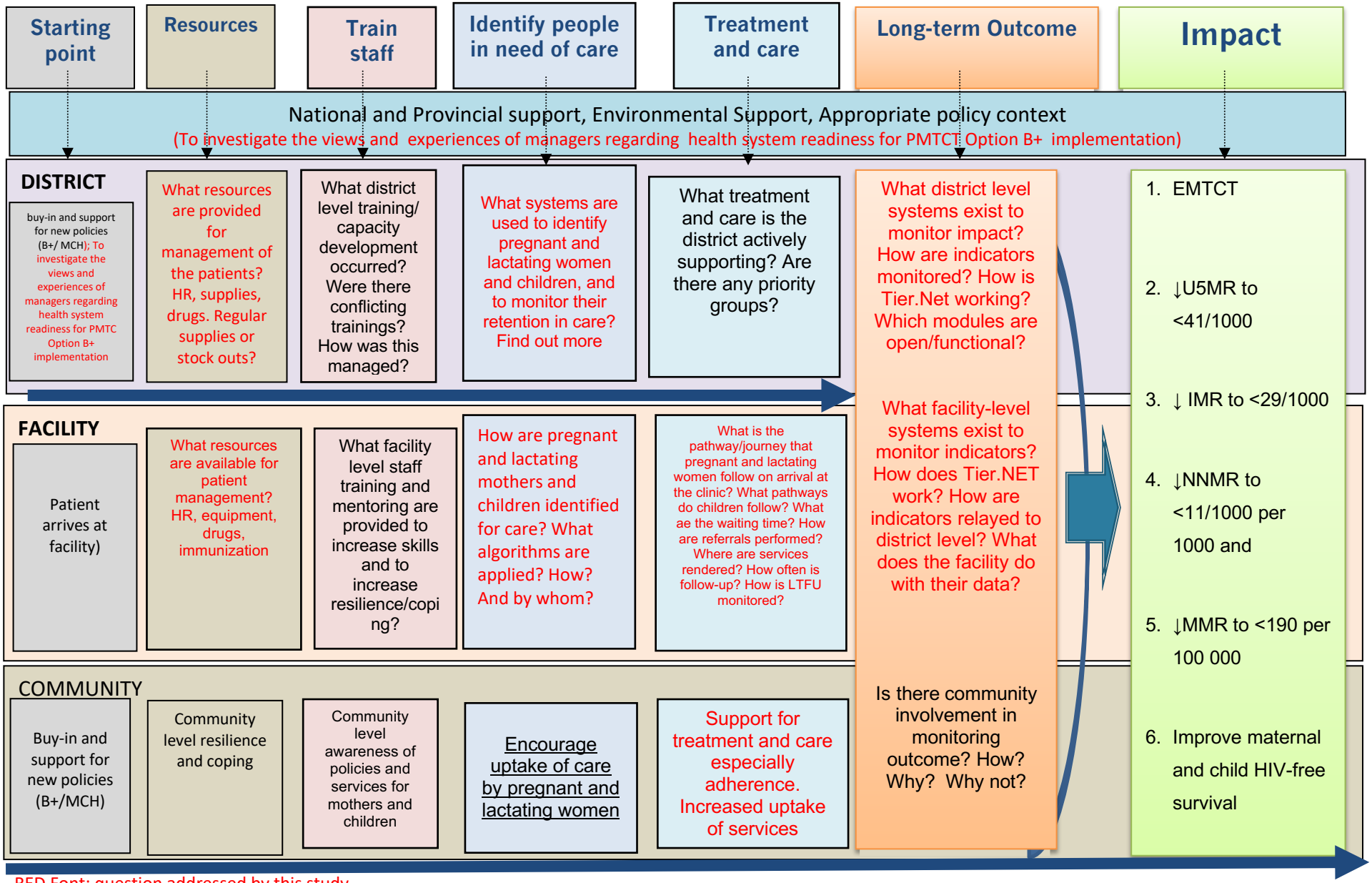
7.0 APPENDICES

APPENDIX 1: THEORY OF CHANGE / LOGIC MODEL FOR IDENTIFYING KEY INTERVENTIONS



RED Font: question addressed by this study

APPENDIX 2: KEY INVESTIGATORS/COLLABORATORS

South African Medical Research Council (SAMRC)		Area of expertise
Prof Ameena Goga	Role: Overall Principal Investigator (PI) and PI on child health outcomes: Prof Goga is a Paediatric Epidemiologist. She will be responsible for protocol development, overseeing the overall implementation of the Evaluation, data analysis, scientific reporting and research translation.	Paediatrics Maternal and Child health Public Health Surveillance Epidemiology
Dr Witness Chirinda, PhD	Co-PI, Overall Research Manager and PI on postnatal retention in care and demographic changes	Demography Public health Epidemiology Research Management
Prof Carl Lombard, PhD	Co-investigator and Chief Statistician on the Evaluation. Prof Lombard is the Director of the Biostatistics Unit at the SAMRC	Biostatistics
Prof Tanya Doherty, PhD	Co-investigator and Technical Advisor. Prof Doherty is a public health expert with an excellent publication history and many years of experience in community based cluster randomized controlled trials and cohort studies and multi-country studies	Maternal and Child health Public Health Statistics
Dr Nobubelo Ngandu, PhD	Co-investigator on overall Evaluation and PI on Equity and provision/uptake of services Dr Ngandu is an HIV Computational Biologist with additional training in Epidemiology. She will be responsible for overseeing data management and analysis in addition to leading the assessment of Equity in provision/uptake of services.	HIV Computational Biology Epidemiology Biostatistics
Dr Vundli Ramokolo, PhD	Co-investigator on overall Evaluation and PI on growth monitoring in routine child health/PMTCT settings	Infant Growth Epidemiology Biostatistics

Ms Yages Singh, MPH	Co-investigator and PI on field-based data collection (systems, quality control and ethics) and facility-based supervision for adequate B+ implementation. Ms Singh has extensive research experience in data management, using mobile technology as a data collection tool, and research ethics	Field Work Quality Control Ethics
Ms Dudu Nsibande, MPH	Co-investigator on overall Evaluation and PI on maternal health, including quality of antenatal care, integration of PMTCT and routine maternal health care, uptake of routine antenatal care. Also responsible for overseeing field work in selected provinces	Midwifery Maternal and Child health
Ms Vuyolwethu Magasana, MPH	Co-investigator on overall Evaluation and PI on qualitative aspects of the work. Also responsible for overseeing field work in selected provinces	Field Work Coordination Qualitative Research
Ms Trisha Ramraj, MPH	Co-investigator on overall Evaluation and PI on adolescent health in the context of PMTCT. Also responsible for overseeing field work in selected provinces	Field Work Coordination Public Health
Ms Nobuntu Noveve	Collaborator and Research Logistics Manager	Research Management
Ms Natasha Titus	Research Support Team member – mobile data collection and data management	Mobile Data Collection
Ms Jazelle Kiewitz	Corporate Support Team – Administration	Administration - Cape Town
Ms Lucille Heyns		
Ms Mathokwa Choeu		Administration – Pretoria
Ms Ntombifikile Mbatha		Administration – Durban
National Department of Health		**Area of expertise**
Dr Yogan Pillay	Co-investigator Dr Pillay is the Deputy Director General at the National Department of Health, South Africa. He will not have access to any personal identifying information of participants during the Evaluation.	Programme Management and Health Systems
Dr Peter Barron	Collaborator	Health Systems

Prof Lesley Bamford	Collaborator	Paediatrics Maternal and Child Health Health Systems
National Institute for Communicable Diseases, National Health Laboratory Services (NHLS)		**Area of expertise**
Prof Gayle Sherman	Co-investigator. Prof Sherman is a Paediatric Haematologist in the Department of Paediatrics and Child Health, University of the Witwatersrand and NICD with a PhD in infant diagnosis of HIV.	Early Infant Diagnosis Paediatric HIV Surveillance
Prof Adrian Puren	Co-investigator. Prof Puren is a virologist at the NICD, a division of the NHLS.	Virologist HIV Surveillance
Centers for Disease Control and Prevention (CDC), South Africa		**Area of expertise**
Dr Mary Mogashoa SEV1051	Co-investigator. Dr Mogashoa is a medical doctor and Public Health Specialist	HIV Care and Treatment
Ms Mireille Cheyip SEV11361	Co-investigator. Ms Cheyip is an Epidemiologist/Public Health specialist	HIV Surveillance
Dr Getahun Aynalem SEV17998	Collaborator. Dr Aynalem is the Research Leader in the Epidemiology and Strategic information section	HIV Surveillance
Ms Anna Larsen SEV10238	Collaborator. Ms. Larsen is an ASPPH Allan Rosenfield Global Health Fellow.	HIV Surveillance
UNICEF South Africa		**Area of expertise**
Dr Sanjana Bhardwaj	Collaborator. Dr Bhardwaj is a medical doctor	Surveillance, Care and Treatment of HIV infection
Technical advisors and co-PI on 2010-2014 South African PMTCT Evaluation		**Area of expertise**
Prof Debra Jackson	Prof Jackson is a midwife and public health specialist	Midwifery Maternal and Child health Public Health HIV surveillance
Technical Advisor on Health Worker resilience and coping		
Farhana Goga (Independent Consultant and short-term contractor)	Co-investigator and trainer / facilitator on the health worker resilience section Will train data collectors to administer the ProQOL™ and Connor-Davidson tool) and will analyse data arising from these aspects of the Evaluation	Psychology Coaching Facilitator: HST Wellness for Effective Leadership

Technical field work coordination		
Epicentre	Epicentre will - coordinate field work	Field work Coordination and Implementation

APPENDIX 3: STUDY TOOLS

Please see separate attachment

APPENDIX 4: STANDARD OPERATING PROCEDURES

Please see separate attachment

APPENDIX 5: DETAILED QUALITATIVE RESULTS (Text Boxes 3-6)

Text Box 3: Readiness and buy-in for PMTCT: Results of in-depth interviews with national, provincial and district managers, implementing partners and facility level case studies

Theme	Summary of results	Quotation
Perceived communication of the Policy and Training		
Communication	National Department of Health (NDoH) informed provinces about the policy through meetings, circulars, and guidelines. Key respondents (KRs) perceived that the strategies used by the NDoH to communicate the policy were clear and effective and made it easy for them to draw dissemination and training plans across different levels. These plans included sensitization of stakeholders and demand creation among service- users. It was also mentioned that there were confusing aspects of the policy which impacted on compliance to guidelines. To create awareness about the new policy provinces, districts, and facilities used a combination of strategies such as memos, meetings for HCWs, open days, special calendar days, road shows, community dialogues, and local radio stations. All the clients that tested HIV positive but were not on ART were recalled and requested to make appointments with the facilities and community caregivers (CCGs) also assisted in recalling those that had clinic files. There were different perceptions regarding who was the driving force behind the Option B+ programme implementation among KRs. Department of Health (DOH) KRs felt it was the DoH while one implementing partner (IP) strongly felt that the NDoH was not taking ownership in driving the policy implementation or even communicating new policies to provinces. There were strong views that the NDoH tended to entrust IPs with that responsibility, that communication lines were not always followed between NDoH and	*"basically the provincial office is driving the whole thing with the district. So, what happens the guidelines were announced on the 1st of December in 2014 …So what we'll do we'll start of sensitizing the programmes managers from the districts about the new guidelines and then from there we roll out the training further to the facilities."* ***Provincial manager*** *"The other programmes that we have in the community is to sensitise the test and treat and maternal and child you know, test and treat. We have open day, like we did open day last year in this clinic, where we showcase what are our services to the community. This year we're improved on that. We took it to the community, we did it in the community uh invited school kids, test and treat. So, every department, every unit inside the clinic had a stand. Maternity, the TB clinic, the ARV clinic, the eye clinic..."* ***Facility healthcare worker*** *"…communication between national DOH and the provinces is not always as …sometimes national doesn't even think that there are Metro health services … sometimes they leave the implementation of these policies to the partners. You[IP] get to the districts and the districts say, and you guys who are you? Why am I not hearing from my province ?.. and the province has not been told, you know. … sometimes it is the province problem because the provinces think that they are autonomous, they can't be directed by national"* ***IP – National***

Theme	Summary of results	Quotation
	provinces, districts, and metro health districts. This they felt had a potential to create strained working relations.	
Training	NDoH worked with provincial teams to prepare districts and facilities. KRs reported that centralized training sessions were conducted, coordinated by the DoH in collaboration with other stakeholders i.e. national DoH staff, IPs, regional training centres, provincial programme managers, district manager and programme coordinators (PMTCT, HAST, MCH). One-day training workshops were conducted in a cascaded fashion at national level for provincial programme managers and IPs. One- or two-day sessions were held at district, sub-districts, and facility levels. The majority of provinces reported that district level training roll-out was completed within a period of one month. Training sessions primarily involved highlighting important changes or key differences between the old Option B and new B+ policy guidelines and addressing frequently asked questions for HCWs. IPs were seen as playing a remarkable role in supporting the PMTCT programme and strengthening implementation by means of on-site support providing human resources, training and mentoring. Planned follow- up training and mentoring activities by provincial and district teams were said to be integrated and informed by data and identified critical bottlenecks.	*"Few people are called to national and few people are called by provinces. And then the district has to cover the whole and that becomes very difficult because you have got only one person as a district PMTCT or on all programmes, only one person. But this person must be all over..... So policy workshopping is tough because you read the policy and then you must run with it. ..... you will get into a facility and find that two people are aware. They know they understand what the policy is all about and somebody else also does not understand. And attitude is also a challenge."* ***PHC Manager - MP***
Readiness and buy-in for PMTCT		
Buy-in	There was consensus among national and provincial, district, and facility key KRs (i.e. programme managers, laboratory managers, facility managers and IPs) that overall, there was buy-in and willingness to implement the policy at all levels. Evidence was there to prove that the policy can be implemented. KRs expressed that given the anticipated increase in the number of antenatal clients to be	*"It was received very positively I think, more especially the doctors. They were so excited with this Option B Plus because what they were stating was that you find that these pregnant women are initiated on treatment and later they are going to stop ARVs. You find that they are pregnant again more especially the young ones. By the time they are pregnant the CD4 cell count is very low. The viral load is very*

Theme	Summary of results	Quotation
	initiated on ART, at the initial stages, Option B+ was perceived by some facility-based HCW as additional workload on the already overstretched HCWs, but they did continue to implement it. Some level of resistance at initial stages of implementation, was reported from HCWs allocated in hospital labour wards as they were expected to do birth PCR testing for which they had not been previously trained. Some facilities did not understand the relevance of this policy, so the district had to repeat their explanations. HCW learnt in the process of implementing the policy and saw the importance after comparing baseline data before implementation with data during implementation. Conducting on-site training and mentoring also simplified implementation and acceptance of PCR birth testing role in the labour wards. KRs also expressed concerns that the DOH's agenda seemed focused in "chasing numbers" to achieving the UNAIDS 90-90-90 targets, the latter was seen as superseding the importance of ensuring client readiness to take lifelong ART, adherence mechanism and strategies to maximize retention in care. Despite this concern, KRs reported that the majority of antenatal clients were receptive to same-day fixed dose combination (FDC) initiation.	*high. Now it looks like we are reversing what we should have sustained. So they took it with a positive attitude and they were for it. They were for it already."* ***Facility staff*** *"the main issue is really this massive pressure on 90-90-90…So everyone is under huge pressure around that which means that all of our attention and resources are being redirected to that."* ***IP-National*** *"So it means that the other elements like your TB services and PMTCT, HIV prevention are sort of being put on the back burner whilst we are desperately scrambling for testing and initiations, without really any sense that we are integrating, tracking those patients to make sure they stay on treatment. That is the sense that I get, …we are reporting on the initiations but our clients remaining on treatment, our retention is not doing so well. So we are throwing everyone on treatment but in the meantime we are losing other people off the other end and that includes the breastfeeding women. They are not given any special considerations because they are breastfeeding and from my experience of working in an adult clinic it is not routine for the adult clinicians to ask a woman "are you currently breastfeeding?" They may not even be aware of it to encourage them to adhere or to monitor their viral load more frequently."* ***IP - National***
Readiness	KR expressed conflicting views with regards to the country's state of readiness to implement the policy. The majority felt the country was not ready asserting that implementation was "rushed and hap hazardous", supplies and drugs were not universally available that other aspects of the policy, (such as i.e. infant prophylaxis, PCR guidelines) were later changed a few months after implementation. In addition, KR thought that although Option B+ policy guidelines	*"For me the process is not a problem but the timing you know, it's never really on time, it doesn't give people time enough to … prepare and roll-out... smoothly. It's always this month for next month or in the next two months and within this three months…it was announced 2014, December 1st, right? … Yah, who's in the warehouse in December? No one is there".* ***IP National***

Theme	Summary of results	Quotation
	were readily available, Monitoring and evaluation (M & E) tools and indicators were not well aligned to the new changes timeously. These included PHC tick registers and PCR birth testing which resulted in missed opportunities and poor management of patients and poor data quality. As such, they expressed concerns that this created an additional need to conduct follow-up training sessions. Inconsistent supply of ARVs and test kits were reported in two provinces; however, this was reported to be due to procurement challenges or changes in the tendering system at the early stages of policy implementation. They also felt there was no human resource planning. Overall, the general perception was that the period between the launch of the policy (1 December 2014, close to the holiday season) and the expected date to implementation (January 2015) was too short and inadequate to properly plan systems and logistics for smooth implementation. This resulted in provinces implementing policy changes at different time points, some delaying up to six months later. (June 2015). On the other hand, some KRs felt the country was ready to implement Option B+. This they based on how they considered the impact of MTCT prior to Option B+, and also compared the process with that for Option B, when FDC was introduced. Their view was that Option B+ activities were well planned with focused efforts which involved collaboration of various stakeholders to ensure optimal readiness. One provincial KR reported that they had positive experiences introducing the because Option B+ was started long before the NDoH announced launched the policy. They also strongly felt that Option B+ came at the right time. Their province was using different provincial	*"We are very good to say we have these policies but when it comes to implementation, we really do not tighten up the preparation before implementation. Implementation becomes so haphazard in such a way that it is not standard across so that we can know at national and say we know for sure. If we say 1st of January we need to start with X. Preparations were made in the previous 6 months to prepare for that implementation, you know." "So, you will find that if you go and visit and you are at the specific facility then they tell you we haven't started yet even because we do not have medication, you see."* ***IP – National*** ***"****So, you could see that some learning is happening as we go on implementing policies but with the Option B Plus it was just a policy you must implement, there is no process of adjusting you know. It was you get the policy today, you train today, you must implement today versus these that you are given time, baseline assessment, feedback meetings, trainings, now implementation, you know that change process it's very important when you implement policies." District Official* *"It was 1 January 2015, right, when we were supposed to implement, and we actually... we started seeing some birth PCR's coming around June, then eventually you know because we would now engage, to say colleagues no, no, no it can't be…"* ***District Official*** *"If you just look at how the roll-out of the fixed dose combination was handled I would say that the system was quite good and in place; …and I think for the general in South Africa with the PMTCT program, there is very few places, once again, I think with the exception of the Free State which actually reported gross antiretroviral stock-out so most of those people had to go without treatment."* ***IP – National***

Theme	Summary of results	Quotation
	guidelines which were slightly different from the NDoH, including SOPs.	*" We were not prepared, … but our counselling materials, sensitivity to patient issues around same day initiations were not as well developed as it could be; but the simplification was incredible and it really was possible to start every woman who came through who was not on treatment already…I can say that was quite incredible but we were not prepared for the patient issues and the same day initiation. Under Option A, the losses of patients was before initiation, but with B plus, it is after."* ***IP – Provincial***

IP: Implementing partner; PHC: Primary health care; MP: Mpumalanga; PM – Pregnant mother; PNN – Post-natal negative mother; PNP – Post-natal positive mother; NAM – Negative adolescent mother

Text Box 4: Perceived implementation challenges: Results of in-depth interviews with national, provincial and district managers, implementing partners and facility level case studies

Theme	Summary of results	Quotation
Perceived Implementation challenges		
Protocol adherence	National IPs felt that job aids which could be easily referred to by frontline workers were not available at the beginning of B+ implementation. They also highlighted that HCWs found some algorithms confusing especially infant prophylactic guidelines. This led to inconsistencies and poor adherence.	*"…When it comes to extended prophylaxis, there is some confusion as to whether let just extend it, nevirapine for 12 weeks or must I add AZT as well. ….and then the infant testing in the extended prophylaxis baby, they don't often remember to do 18 weeks test."* ***IP – National*** *"So, I think with those change overs people got a bit confused do a lot of training and from that perspective I do still feel that people find the infant prophylaxis part sometimes difficult to understand"* ***IP – National*** *"...So, in the X province the postpartum breastfeeding algorithm is quite well set out and not very complicated so, the intrapartum, not intrapartum basically antenatal viral load monitoring protocol in the X province, which becomes a bit complicated and then we have viral load monitoring algorithm for breastfeeding women."* ***IP – National***
Staff shortages	KRs felt that needs assessment was not done prior and additional human resources not provided to meet increasing demands for HIV counselling and testing and ART initiation and policy was implemented before adequate training coverage in some facilities. Staff shortages, resulting from staff turn-over and reliance on inexperienced comm-serve clinicians. Use of retired nurses who had outdated information compromised proper management of patients. Some program managers lacked data analysis skills as a result they could not interrogate data and implement corrective measures where there were gaps. Infant testing uptake at 18 months was reported to be low.	*"They do not check if the facility capacity is able to implement the programme. That was the major challenge. But now we have extra programme but still the staff remains the same. So the challenge was on resources."* ***Facility health worker*** ***"****I would say we were not ready. We were found wanting because remember the biggest problem that we are having in terms of capacity building. It is very difficult because in most of our facilities we work with skeletal staff. If you have to call people out of work it is very difficult, because you are chasing numbers. The waiting time, patients are very angry ..." District Official*

Theme	Summary of results	Quotation
	The shortage of counsellors to provide ongoing counselling to newly diagnosed women, lactating mothers, and those with high VL was identified as a critical factor compromising retention in care and EMTCT. It becomes a challenge to offer counselling that is of good quality when you have people on the queue to offer other services. Lack of proper counselling is a threat for treatment adherence. Defaulter are sometimes referred to a social worker for further counselling, but there is no feedback on how certain cases are being managed by the social worker because of the high volume of patients that clinicians have to see/provide care to. There were concerns that in some instances when there was shortage of staff, IPs found themselves offering patient care rather than mentoring staff. This has a potential to affect sustainability. KRs mentioned that they had to deal with challenges associated with using HCWs, especially counsellors employed by IPs. These mainly related to different working conditions, e.g. stipends vs full salary, medical aid benefits which have a demotivating effect to some.	*"You only have five, ten minutes at most to spend with the patient, you see most like 120 patients in a day so, often times we refer them to a social worker so, you don't know, from there we don't collaborate enough to say ok, how did you resolve this, how did you resolve this. So, uh the social problems are pushed to social worker but I mean we do not get enough feedback to say uh how did you resolve it and were you able to assist especially when it's issues dealing with your relationship, there is very little we do regarding that."* ***Facility health worker*** ***"****It doesn't help then you end up doing the work yourself and when you start doing the work yourself then sustainability flies out the window****" IP National***
M & E tools and systems	Poor recording of services rendered had negative impact on the quality of data and this affected M&E of the programs. Data would sometimes report missed opportunities for ART initiation, but when facilities were visited, some records indicated that all eligible clients were initiated. Shortage of data capturers and lack of understanding for data elements compromise the quality of data. Data errors were observed on a monthly basis, some facilities would not do information matching before submission to district level. Some challenges were attributed to paper-based, non-standardized data collection tools (many/different registers across provinces), delays in updated DC tools, poor data verification, lack of computer skills especially among nursing personnel and poor integration of services.	*"Oh, that one we have a serious challenge because now we, fortunately we have been trained on the web DHIS. Now you will find that when you check in the web DHIS there is information that was not captured from the facility and data is a challenge. It is a real challenge and we have got the [inaudible] central office to say we need to verify data starting from the facility, then to the sub-district and then to the district office but it is not being taken seriously. I must be honest. Starting from the facility. From the facility they need to ensure that like it is Monday, daily they need to ensure that data is collected and collated and given to the data capturer for capturing. But you will find that they have done the service but it does not appear on the web DHIS****." District Official***

Theme	Summary of results	Quotation
	One IP reported that their provincial PMTCT register was different from the one approved nationally, while another province reported using an electronic register tick register. Postnatally, KRs stated that there were missed opportunities in monitoring 10-week, 18-week, and post-breastfeeding cessation PCR results. Over reliance on IPs for monitoring and evaluation support created gaps in the DHIS and TIER.net data entry. Poor monitoring of VL and PCR positive test results was identified which may impact patient management. There were no standardised systems for recording and monitoring for viral load tests done. Furthermore, there was confusion on handling of viral load results which were sometimes inserted in the patient file or capture on the patient chart. Using these methods back and forth created backlog for data capturers. KRs appreciated efficient systems introduced by the NHLS; however, they stated that results were not actioned by clinicians at facility level and printers meant to receive results were not used by some facilities. Not knowing viral load at delivery is problematic as it impacts on how a mother and new born are treated e.g. breastfeeding counselling, treatment during labour, new-born management (dual therapy with high viral load), period of prophylaxis. There were reported delays in getting hard copies from the lab as it was not always feasible to access web-based results since not all facility staff were granted access to it. Concerns were raised around poor coordination on strengthening health systems as a whole, citing weak relations between IPs working in home-based care and PMTCT programmes. This was perceived as a disadvantage for linkage to facility care.	*"We do have some challenges with the laboratory because we do not get our result in time as expected but we have got a web access viewer. We are able to view the results on their web. Then you can be able to tell the mother the results and monitor there but most of the time getting hard copies from the laboratory is being a challenge."* ***Facility healthcare worker***

Theme	Summary of results	Quotation
Drugs and consumables	Adequate drug and laboratory supplies were ordered to meet the increased demand. Drug stock-outs were reported in 2 provinces during scale-up. Few facilities also reported expired test kits/confirmatory kits for a period not exceeding 2 weeks. Laboratory systems were reported to be functioning smoothly.	
Quality of services	The facility infrastructure/physical structure where patients were seen included different areas/rooms, and was not always conducive for integrated care. This sometimes led to poor management of patients and high rates of loss to follow-up. Poor quality of counselling and lack of ongoing support for newly diagnosed pregnant women, breastfeeding mothers, and potential defaulters were reported. This was reported to be due to shortages of counsellors. Some KRs felt that there were competing priorities in managing HIV/AIDS. PMTCT was no longer prioritized; they perceived that the IPs' focus and resources have shifted to achieving the 90-90-90 targets while the most crucial PMTCT elements (i.e. preventing new HIV infections) were no longer monitored. This made it difficult to develop targeted interventions since gaps were not clearly defined. Moreover, the competing priorities affect effective implementation of MCH, PMTCT, TB and HIV/AIDS prevention programs. During scale up, lack of skills on collecting birth PCR specimen among labour ward staff caused resistance until follow-up on-site visits were done.	*"We try, we're integrating it but remember some of these structures are built fifty, forty years ago compartmentalised. Now we're saying we want to integrate, you need to break barriers down, structures. We're trying to do it with in the confine of our infrastructure, you know, but sometimes it's a bit difficult but we're trying like, Dr…treating TB, he is the one that is treating HIV. But in terms of the ideal clinic it's even more different, everybody needs to come into a big hall and they get seen by one doctor or one sister. That we are not able to do. Integration and things that are probably not and then make it improve and then making it realisable is in terms of the staff strengths, the infrastructure, you see them, the number of patients are increasing but we still have the same facility. Then records, submission of records, I mean changing records from manual to digital to being in [inaudible] book our patients, to be able to say that uh we'll be able to record…"* ***Facility healthcare worker*** *Some city sites provide full basic antenatal care but they don't provide ARVs so you still have to go to the provincial sites. And to make it even more confusing in some facilities the provincial will have its site in the same building. So, it is, they are working towards integration of services obviously, but it is still very confusing to the patients."* ***IP – National*** *"we have not mastered yet is to link our own programming or maybe to follow up on the clients that are part of the differentiated care of treatment support. So, you will find out our clients are getting*

Theme	Summary of results	Quotation
		treatment somewhere, clubs, wherever but with us they still appear as if they are not on treatment. So, that gap we still need to figure out how, because you see once we figure that out we will hit the 90% mark." ***IP – National*** *"…postnatally, are not clearly counselled that if you have negative birth PCR your baby is still at risk during breastfeeding. So then they are lost to follow-up as soon as they get their negative birth PCR result; … everyone celebrates and says congratulations. There isn't really the follow-up to say but if you are breastfeeding you must continue taking your treatment and you must give your kid the prophylaxis up until six or twelve weeks and you need to stay engaged in care until you have stopped breastfeeding."* ***IP – National*** *"The main issue with the supporting partners is really this massive pressure on 90-90-90. We are all running around like headless chickens chasing impossible targets that have been set based on unrealistic prevalence within our districts… So it means that the other elements like your TB services and PMTCT um, HIV prevention are sort of being put on the back burner"* ***IP - National*** *"…since 90-90-90 and test and treat came along, PMTCT has fallen off the agenda quite a bit for the supporting partners. …. We are so focused on getting people tested and initiated on ART that the maternal and child work is sort of being pushed to the side. So, you know, for the last couple of years I have seen less opportunity for us to invest in the PMTCT programme and give feedback… so resources have been taken out of PMTCT to some degree. Um, and also the, yeah, the sense that we have won with PMTCT, that our rate has gone down from over 20% to around 1%. This is partly sorted. We can move our attention to something else. The problem is the postnatal part is*

Theme	Summary of results	Quotation
		*not sorted, and the new infections in negative women is not sorted out**." IP – National***
Patient related challenges	There were also clients who would collect ART from another clinic and receive ANC services in another clinic. Despite clients being always encouraged to receive both services in one clinic, this did not always occur. Clients shop around for ART and they do not ask for transfer from their original clinics, use of patient unique identifiers would eliminate this challenge. Booking below 20 weeks gestation was reported as a challenge. KRs stated that the majority of pregnant women understand why HIV testing is important; however, there were still very few clients who rejected ART due to cultural and religious beliefs.	*"It's very difficult especially with the adolescent…even though the social worker comes on Saturday, not very frequent so the adherence counselling has to be done by the doctors or the sisters. We counsel them, we talk to them, we ask them to bring their parents, for those that we find difficult, those that are actually have lots of social problems…Once we see them we know the clinic is about to close. So how do you assist such, you know, So, the other thing we do is show them the pictures of complications arising from not taking medication you know, a wasted person…also some opportunistic infection hopefully that encourages them but it is quite a tough call especially in adolescents. So, we have tried… it's quite a bit of a challenge, you know, with all the adherence counselling."* ***Facility healthcare worker*** *"The experience we've had and seen, even we look in terms of the numbers the females are much more on treatment and care than men. The men default more than females and in terms of the support, partners support, very, very few partners coming together for treatment…That is a problem because their partners do not accompany them to the clinic. So that one is a challenge because we give information to the women but the men they do not come to the facility. They hardly come to the facility and we are not even sure if they give them the information at home. So that is why sometimes we do have problems to find that the maybe the woman is HIV positive then the partner does not want to use a condom and then end up the baby being born with HIV. So that one is a great challenge. We advise the women to tell their partners to come for testing. But we are still going in the very slow progress because they do not really understand."* ***Facility healthcare worker*** *"Another challenge is, I think it is education or understanding of this programme especially on our clients because we even though we*

Theme	Summary of results	Quotation
		educate them or counsel them but some of them do not comply with whatever we advise them to do. Like in exclusive breastfeeding, when we inform them they need to exclusively breastfeed for the first six months or forever, most of them they do not comply. That is why we end up sometimes find babies who are PCR positive and their viral loads very high. Some of them are mix-feeding as early as at birth, breastfeeding and giving something else." ***Facility healthcare worker***
Breastfeeding practices	Release of a national breastfeeding circular in 2016 was seen as good by majority of KRs, however, it was also confusing for many HCW especially for an important aspect which is viral load monitoring for breastfeeding mothers. IPs felt that promotion of breastfeeding is crucial whereas majority of HCW felt that is should be promoted with caution since ART adherence and viral load suppression are not always achieved. They also expressed a concern for not being able to counsel/educate women on how to formula feed correctly since it is not a method that is not promoted. They further stated that most mothers breastfeed during hospitalisation since they know that healthcare workers expect them to breastfeed. When they get home, they formula feed and some do not know how to formula feed correctly because they do not have knowledge as they used to be educated and given choices before. As a result, in one district, breastfeeding rates on discharge were reported to be around 90% but drop to 48% around 14 weeks.	*"Yes we are talking about faith breastfeeding, so this woman needs to know how to adhere to her ART, they need to know their viral load , they need to have a lot of information so that they can make informed decisions to breastfeed and not to make a blanket and not for the clinicians to make a choice or a decision for woman. That's the only challenge about that policy, you know for me I think it would be best to educate woman in terms of adherence, viral suppression, and faith breast feeding."* ***District Official*** *"So currently we were talking about this in our district prenatal meeting where you find that you have 90% breastfeeding mothers on discharge when they go home but when we are monitoring the indicator at around 14 weeks we are only sitting around 48% so it shows that when they go out of the hospital, they stop breastfeeding or they mix feed and this is even before the 6 month period so I think the feeding part of it we are not there yet. We have a lot of work to do around feeding and counselling the mothers."* ***District Official***
Male involvement	Male involvement is a crucial aspect for effective implementation of B+ and EMTCT; however, there is still resistance among male partners to access services.	*"I think male involvement is very important. I think the day we win man onto the program we will see even less mother to transmission rates because what happens is, like I have spoken about disclosure. If male partners are not involved in HIV testing, ART initiation, they are left while the woman is taking ART and most of these couples you will find that they are not using protection, although the mother is on ART but they are exposed to re infection because the partner is not on ART*

Theme	Summary of results	Quotation
		and if they are not using condoms, so it's even worse. So it's very important that they are also enrolled onto the program. I know that in the guideline we talk about couples testing and male partner initiation, but we haven't seen a lot of that happening. We did not succeed." ***District Official***

IP: Implementing partner; PHC: Primary health care; MP: Mpumalanga; PM – Pregnant mother; PNN – Post-natal negative mother; PNP – Post-natal positive mother; NAM – Negative adolescent mother

Text Box 5: Perceived innovations, enablers, successes, and key considerations: Results of in-depth interviews with national, provincial and district managers, implementing partners and facility level case studies

Theme	Summary of results	Quotation
Perceived innovations, enablers, successes and key considerations		
Enablers	A variety of innovations were reported by KRs to have been introduced either by national, provincial DOH, NHLS, facilities, or IPs to improve Option B+ guideline implementation. Some of these were reported to be introduced by IPs and shared across provinces and districts after having been shown to be successful in closing identified implementation gaps. The establishment of technical working groups (where implementation gaps, progress, best practices and successes are presented within a multi-sectoral platform) was viewed as key in improving policy implementation across provinces. KR also felt that supervisory support site- visits, quarterly and monthly review, stock-take meetings, and dash board reports were all effective strategies to improve policy implementation at different levels.	*"Yes. we used DHIS because you know there was a target of initiation, antenatal initiated on the ART. We do have a target. So we were working towards that target. We extract data per facility and check if they have met the target. If not, we check how many clients, antenatal clients who were eligible for initiation, that needed to be initiated and then that they did not initiate. Then we go but especially to poor performing facilities and then we check how many they did not initiate and the new go through their files and check if they have initiated or not. But you will find that most of them were initiated. The issue was they did not capture them into DHIS. This that I am telling you about, I did it when I was now in the programme, from 2015 already when I arrived, Option B Plus was implemented. So this is what I was doing to make sure that Option B Plus is implemented."* ***District Official*** *"……when you bring a nice purse, a relationship seems to be going very nicely. If you bring money into the table of course. If you say to people look, I can buy you a computer, you seem to be struggling or ..

Theme	Summary of results	Quotation
	KRs appreciated the role played by IPs and saw them as playing an invaluable role in the success of Option B+. They provide Nurse Initiated Management of Antiretroviral Treatment (NIMART) and Doctor Initiated Management of Antiretroviral Treatment (DIMART) training, data management support, HCWs (nurses, counsellors, Community Health Workers (CHWs), and equipment/infrastructure. It would seem that this support provided by IPs strengthens working relationships. Known benefits of universal test and treat for mothers' health status and preventing partners from being infected were set out stronger in the current messaging during counselling and this improved testing uptake whereas before much priority was on preventing babies from being infected. Taking one tablet a day was also reported as an enabler for ART adherence as it is much easier to swallow compared to complicated regimens with a number of tablets and side effects. Learning good practices from other institutions and trying to adopt in their province can be useful in strengthening services and more knowledge was sought on how to improve family planning services in the KZN province.	*I can resolve your issues, I think that those relationships seems to be [good]".* ***IP National*** *"Professor X..., they developed the pocket booklets which, you know, it is in their pockets or it's available at all time. They summarise all the algorithms. …. We enlarged them. So, in all our clinics we've got updated algorithms. … and also in the consulting room where ANC is done."* ***District Specialist***
ART initiation	Availability of resources such as drugs and good laboratory service system were seen as enabling factors for UTT and Option B+ implementation. Strong cadres of primary care staff trained on NIMART displayed deep commitment accompanied by energy and enthusiasm to eliminate HIV transmission. Moreover, IPs played an important role in HIV service delivery in terms of human resource provision, training, and mentoring HCW initiating patients on treatment. This innovation has facilitated successful implementation of Option B+.	*" one of the big successes was the NIMART programme that was initiated. I think if we did not, who ever had that vision of training nurses to be able to provide the ART services, we would have been in a big mess today."* ***IP -National*** *".. what our organisation actually did is we put people in place a doctor or NIMART trained nurse in that facility to provide the ARV services which then could or could not include PMTCT services depending on what the need was. provide technical assistance, so*

Theme	Summary of results	Quotation
		then we would actually be the trainers of staff." IP- National" ***IP National***
Birth PCR testing	Registers were revised to capture birth PCR tests and PCR positive tracking tool was developed.	
Re-testing, Viral load monitoring and PCR Testing during follow-up visits	For quality improvement they put stickers as reminders for 3 months re-testing of HIV negative breastfeeding postpartum mothers. This is also done for viral load monitoring. The method displayed success in monitoring patients. Clients were also assigned a patient advocate or a community care worker who followed them regularly at home. To monitor progress and strengthen implementation, facilities used supplementary note books and created set of indicators and data sets that were not on the registers used. One district in KZN designed EMTCT forms and have been adopted by the whole provincial or even national department which are part of the new maternity records. They attached that form in the patient maternity records and all the baseline bloods done by a woman during antenatal care are recorded. It reminds the midwives to do the viral load at 3 months and then at 6 months after initiation and all the intervals for viral load tests are there in that form. There is also an EMTCT tracking tool in a form of a register. When the baby is coming for an immunization (EPI) or postnatal visit within the 6 days or at 6 weeks they collect the baby's detail, the mothers' details, the phone numbers, 2 phone numbers so that when the results come back they can be traced back using the physical address and those details. This register also has space to document all the infant's HIV test results. There are columns for recording of PCR results around 10 weeks, 14 weeks, and the 18 month test. There is also a column for prophylaxis that	*"…In terms of viral load monitoring we, in the dashboard for this financial year we had the viral load done and viral load supress for pregnant and breastfeeding women. But the thing is we do not have that indicator in DHIS so we have created a provincial indicator set, data element and we have monitoring it, we hope that in the near future this indicator will be on TIER so that they can be able to extract the viral load due for pregnant women, the viral load done for pregnant women, viral load due for breastfeeding women, viral load done for breastfeeding women, viral load due for paediatric clients and viral load done for paediatric clients. So, right now we have, we do not have it in the paediatric register so in the facilities they have got exercise books and they do it manually with your task kit to say when the clients come the lay counsellor or the an ENA [enrolled nursing auxiliary] will look into the file and see those that are due for viral load and they will do but we are not doing well form the 2016 we were like 40% but with it on the dashboard we think a slight improvement but it is not an improvement that we would like to celebrate, we cannot celebrate yet, we are not doing well."* ***Program Manager*** *"And the district they are taking care of this results organiser, updating workshop around that time it was introduced. So, for quality assurance and updates and uh any other extensive adherence counselling, especially MATCH [an IP] is really supporting us and I think on Wednesday and Thursday there's a MATCH counsel of phlebotomists and the doctor, they are always here and on Thursday they bring their mobile initiating the mobile clinic. So, we are not short*

Theme	Summary of results	Quotation
	was given at birth, then a column for Bactrim prophylaxes. Mother's viral load tests results and feeding methods are recorded there so that if the baby become PCR positive then potential reasons can be traced back from reviewing this register. It documents the journey for the mother and the baby. In trying to monitor transmission rates at Sub-district/district level, NHLS data is being used. Birth PCR transmission rate is less than 1% in the district.	*of uh and often they are away for six weeks, I think the last few six weeks they go, they came to reassess us, the MATCH, to see whether there is any gap in all the services that they are supporting."* ***Facility healthcare worker***
Management of clients and retention	KR reported that there was an effort to integrate services, such as providing a one-stop shop for mother-baby pairs, MCH, and family planning etc, and this ensure good retention in care. Some felt the Ideal Clinic Initiative, which encourages booking client appointments, made integration less practical. Laboratory related innovations (improved laboratory systems, training to reduce missed diagnostic opportunities (MDOs), short turn-around-times (TAT), RFA and provision of facility printers) were deemed to be critical in closing MDOs and facilitating tracking clients lost to follow-up. To improve access to services for adolescents, a KZN district is working close with the schools, having dialogues with adolescent girls and do referrals, when necessary, and conduct health promotion activities including distribution of condoms. One facility in eThekwini district (KZN) reported that they have adolescent friendly services on Saturdays to provide reproductive health, psycho-social, and HIV/AIDS services including making sure that their viral load is done. HCWs and a social worker volunteer for this Saturday service. Funding for this component has been sought without success. Nurses were also trained on how to provide adolescent friendly clinical services although there are still	*"we have an in-service training every Wednesday to improve the knowledge and the gap internally every Wednesday, we have in-service training for all the doctors and the nurses. We resume 07h00 to 8h00 or 07h00 to 08h30. So the doctor presents and sometimes the nurses present, then we do audits and mortality and morbidity meeting, identify those missed gaps, improvements and we make sure that it's not name and shame so that people don't get scared. So, we discuss cases there and uh other improvement we've done with yesterday is uh, I think we work like more or less like a group."* ***Facility healthcare worker*** *"we have active client follow up system, right, … if a client misses opportunity, at the facility or misses appointment, now we wait for three days before we follow that client up…So, , we call the client, … Mothers2Mothers' mentor mother or WBOTS, any other community based, um, cadre that we are working with within the facility. So, it's a system that is supposed to be integrated within the facility …"* ***IP – National*** *"We now have a HIV clinic for adolescents, on one Saturday every month, adolescent and children because what we realise was Monday to Friday they get sucked in with adults, some of them are in school uniform, they don't get seen until 2 o'clock, after 1 o'clock you know,*

Theme	Summary of results	Quotation
	challenges because it is not fully implemented in all facilities especially those that are not operating 24 hours. IPs developed reference guides with summarised algorithms to ensure adherence to the policy. These were useful for quick referencing during consultation with clients. Use of mobile technology was reported to be useful for communicating health messages and reminding clients about their clinic appointments. Ideal clinics improved joint team work and strengthened relationships as well as overall service delivery for clients.	*so we realised they are missing school, we're missing something in their biological failure so we took them out and then we see them on Saturday. So, for some of them, maybe one or two, we pick up they are pregnant I advise them if they want to have a baby or if they want to consider the option of uh…Termination, we've been running that for the last three years. We integrated the service, when they come on that Saturday, if they have any other problems we attend to them. We also have a social worker that comes on that Saturday. Because some of them haven't disclosed, or they don't know the treatment they are taking so we do and every December for the last three years we do get some sponsors, or we contribute and have a party for them."* ***Facility healthcare worker*** *"We do have the Mom-Connect services where we send messages to their cell phone. We educate them about the dangers of pregnancy, the signs of labour, the appointment dates, treatment they are supposed to take, what they are not supposed to take and breastfeeding. So we do have that. When they start the antenatal clinic we register them on the Mom-Connect with their cell phone. So they do get messages on a regular basis about everything concerning their health and wellbeing."* ***Facility healthcare worker*** *"We are just waiting for those results but we are doing very well with ideal clinic assessment and also with the very same functional integration with local government. We work hand in glove, like we have meetings it is joint meetings, like the DCTC, District Council Technical Committee. We have that. We have our district service delivery committee where we meet as counterparts and we give our reports. But reports are done jointly, like you will find that there is EPI manager in our side from province also EPI manager from local government. But in that meeting we are saying we are not going to*

Theme	Summary of results	Quotation
		take two reports. They need to sit and make sure that they write one report that is going to be presented jointly and that is working very well." ***District Official***
Data quality strengthening	A tick register was developed and DHIS has migrated to web-based DHIS. Unique patient identifiers eliminated duplication and wasteful expenditure. Web-based laboratory systems enabled facilities to access lab results quickly and this improved TAT. To improve the quality of data and service delivery the facilities established nerve centre meetings which involve multi-disciplinary teams to interrogate HIV data, identify gaps and discuss resolutions. Daily and weekly facility data review meetings by data capturers and clinicians strengthened policy implementation and improved data quality.	*"It's improved data collection because you know every Monday you have to account for the last week and right there and then you are able to see who performs, who is not performing, the reason for not performing and when we get to that cluster meeting you are questioned because every other facility are represented by two or three staff, the operational manager, monitoring and evaluation so, they project your statistics and start questioning. It helps us to see the performance of the facility and the programmes. We are able to detect if there are challenges in the programmes and we also identify improvement plan where gaps are. So, and then to even understand how this facility performs through the data. And if there is a discrepancy also I have to involve the staff to say now this, if this happens what are the problems, and then we sit down and discuss and come up with improvement plans."* ***Facility healthcare worker*** *"But with the completeness we make sure that we verify on a weekly basis. When they have collected data then we verify weekly and before we submit to DHIS also we do verification and if there are gaps, then we rectify it before we submit to the sub-district."* ***Facility healthcare worker***
Impact/successes	The major successes of Option B+ were reported increase in HIV testing rates to close to 100%, about 96% of women who tested HIV positive during ANC were initiated on treatment with improved health status. There are less babies who get infected. A remarkable decline in PMTCT positivity rates from over 20% to around 1% nationally. This was attributed to Quality Improvement interventions introduced.	*"We are less than one 1% so there is a huge reduction in the transmission but we still ensure that those babies that are becoming HIV positive around 10 weeks, at 18 months, through breastfeeding and high viral load from the mother through breastfeeding. The Option B plus is working it's just that if we could have 100% adherence as well as the dual protection from the mothers who are negative that would actually help us reach the zero transmission but we are actual having a low transmission."* ***Program***

Theme	Summary of results	Quotation
	Viral load suppression for adults and adolescents was reported to be at 95% and 92% respectively in the KZN district.	
Key Considerations	Enough copies of the guidelines should be printed beforehand including summarized versions like laminated algorithm charts. These will be useful for onsite training and referral during implementation. To achieve good outcomes for Option B+, quality of ongoing counselling that focuses on risk reduction, ART adherence, family planning, breastfeeding, and other important aspects is crucial. Establishing stronger linkages in care by starting community-based ART initiation and delivery of treatment at home could address some of the gaps. Staff compliment should be considered, more work is being added, but number of staff is not considered. there are transfers and resignations and filling these posts can be a long process. Before implementation of a new policy, consultation, piloting, resource assessment (human resources, infrastructure, and monitoring and evaluation systems) should be considered.	"*Proper planning and consultation before implementation would be useful. Allow at least 3-6 months between launch and implementation for proper planning. December time- not ideal for scale up, warehouses are usually closed. Strengthening community-based support and promote family orientated policies for improved facility-based services and better health outcomes. South African government should make PrEP available. Stakeholder consultation with multi-sectoral representation gives a balance of voices and expertise. IP resources should not only concentrate on HIV and AIDS, some could support non-communicable diseases or whole component of MCH services."* ***IP National***

IP: Implementing partner; PHC: Primary health care; MP: Mpumalanga; PM – Pregnant mother; PNN – Post-natal negative mother; PNP – Post-natal positive mother; NAM – Negative adolescent mother

Text Box 6: Results from focus group discussions with service users

Theme	Summary of results	Quotation
Knowledge of PMTCT Option B+	All women had good knowledge about PMTCT, and they perceived it as a good programme that promotes HIV testing for both pregnant and post-partum mothers. Knowing your HIV status and taking treatment immediately was seen as something important. All women believed that ART is helpful/beneficial in reducing transmissions, improving health, and prolonging life. Being on HAART continuously was also seen as an advantage for women who wanted to have more babies without fear of infecting them especially when pregnancy is planned in consultation with the health care workers and child spacing is taken into consideration. Although the majority of women seemed knowledgeable about the value of PMTCT, there were gaps on how they have been counselled. Mom-Connect was useful in closing information gaps and giving support for mothers that tested HIV positive. While it was seen as a good programme, it was mentioned that some women feared knowing their HIV status and as a result some wouldn't access health services opting to give birth at home. It was rare that women felt they were forced to test, because those that refused testing were not offered ANC services in some facilities. They were turned away until they decide to get tested. Some were offered pre-test counselling which made them to agree to testing sometimes.	*"For some people, you are able to know about diseases that you were not aware that you are living with because when you are pregnant you get tested for everything, you are also able to see that your baby is growing well, there are no problems."* ***PNN*** *"we see it as something that is good because it helps you to be able to know your CD4 count and to be able to start the treatment early before you get ill. You might think that you are fine meanwhile your CD4 count is 20 and it's difficult to get your CD4 count up once it's too low. You might end up giving birth to the child while your CD4 count is too low and that might make you and the child sick. So, it's important to check early for the wellbeing of both yourself and the child."* ***PM*** *"I think when you are taking treatment, your cells fight for you, so that you feel strong every day. If you don't take them, you cannot live for a long time, you will die soon."* ***PNP*** *"Yes even after delivery it is important to continue with treatment so that she can live a longer life and feed her children."* ***PNN*** *"Those that that take tablets live a better life as they don't normally get sick. And those that don't know their status are the ones that get sick because they don't know anything about their health."* ***PM*** *"In 2003 I tested positive and yet my child is negative and is alive. I am well and it has been five years and still am good."* ***PM*** *"When they are pregnant, they even fear visiting the clinic because of being tested. Some end up giving birth at home."* ***PN***

Theme	Summary of results	Quotation
		"They (Mom-connect) told us that even if you are HIV positive you can still have a baby, you don't have to be stressed" ***PNP***
Experiences of PMTCT clients	Mothers that are in the PMTCT program had knowledge about importance of adhering to treatment and having viral load suppressed. They reported that their health improved since they started taking treatment, few reported side effects that lasted a day and up to a month but did not make them to stop taking treatment. They knew when their viral load tests were due, and they expressed concerns when tests were not done. One mother reported that hers was not done when it was due because of the expired test kits.	*"Personally, I don't have a problem because since I started taking ARVs I was never sick…So I decided that nine is fine for me and my viral load was 45, meaning I'm responding well and they told me that it is fine."* ***PNP*** *"Coming to side effects, when I started taking them hey! I felt like my mind was not stable, I was like I'm going crazy that night, but the following day, nothing happened. I was feeling drunk and my sleep was disturbed (laughing) it was not understandable as I would wake up, then sleep again, but I only experienced this on the first day. The following day it did not happen."* ***PNP*** *"Recently I was told that while you are pregnant, viral load should be checked after every 3 months, then after delivery it should be checked after 6 months. Then I told the nurse that they have not checked me and I should have been checked last month. So the tubes that they are using for bloods have expired. Now I don't know how much is my viral load suppressed…I'm not feeling good about it because I'm even breastfeeding and I should know if my viral load is suppressed so that I don't put my baby at risk while breastfeeding. Now I'm always worried, thinking that if it is not suppressed or suffer kidney failure, because they have to check that as well"* ***PNP*** *"When I started taking the treatment my viral load got better and my baby was born negative." PNP*

Theme	Summary of results	Quotation
		"I see is as a good thing. I started taking treatment when I was pregnant. I was feeling weak before, but I got better even the child was born normal." ***PNP***
Counselling and testing	The majority of women felt that after group education testers do not further explore their individual needs during testing. All HIV negative women felt that post-test counselling was inadequate; HCWs only emphasized partner testing and 3 monthly re-testing. HIV positive women who received post-test counselling mentioned that they were counselled on the benefits of treatment adherence for viral load suppression especially during the breastfeeding period. Also, they were often advised to breastfeed exclusively for 6 months only and not beyond. HCW perceived breastfeeding beyond 6 months as a risk for transmission. Almost all women who tested HIV positive were initiated on treatment (ART) immediately, and only one reported that she received treatment after 3 days of being counselled on treatment. The majority of these women received support from their male partners and family members to whom they disclosed their status. Mothers who were referred to mom-connect mentioned that they received more knowledge about PMTCT. Mom-connect was seen as supportive and resourceful to mothers in the PMTCT programme. Mothers mentioned the importance of pre-test counselling and post-test counselling.	*"I got to know that I am HIV positive pregnancy, …my first pregnancy. My child is 3 years old now. I was not counselled, I was just started on treatment. I continued taking treatment until I delivered my baby. I was stressed for some time, but later I accepted my status. For about a week then I accepted and I was fine…"****PNP*** *"Hey, I did not receive counselling, but I got on Mom Connect immediately because I just started taking treatment and I got pregnant 2 months later. They then told me that it is better to start antenatal care visits and then they gave me treatment. But I didn't get counselling. I started seeing Mom Connect when I was 4 months pregnant. You get most information from Mom Connect. When the baby was born, we were given syrup for the baby to take until 6 weeks, but the syrup was not finished and the baby was 6 weeks. I was not sure whether I should stop giving her the syrup or not, but I asked the nurse and she said there is no problem so I gave the baby anyway. At 6 weeks, the nurse told me that it is not a problem because I was also taking treatment when I was pregnant, so she is not at high risk of being infected…I was sick already…I had problems with kidneys… for about 4 years."* ***PNP*** *"the sister said I can't breastfeed after 6 months because there is a possibility that my baby might be infected. So, I was told to stop at 6 months."* ***PNP***

Theme	Summary of results	Quotation
		" I was told that the baby might get infected if I go beyond 6 months, but I would have loved to carry on." ***PNP***
Disclosure	The majority of women accessing PMTCT disclosed their HIV positive status to their partners and family members. All of them received support from their families and partners, including partners that tested HIV negative after their disclosure. Almost all male partners initiated condom use after knowing their HIV status. The few women that did not disclose their HIV positive status, were afraid of being discriminated against, stigmatized, dumped, or experiencing partner violence.	*"I fear that he may not be supportive. He usually talks bad about people who are HIV positive. I just don't know how to approach him because he does not speak well about HIV positive people, you see!"* ***PNP*** *Disclosed to "My man because I live with him. He went for his test, we are now both on treatment. He was supportive because he was always saying we should go for HIV testing, because it is not good not to know your HIV status when there are so many people that are sick."* ***PNP*** *"I told him (partner) that he should also get tested then he said ok it does not matter. He got tested and is also taking treatment…since 2017…he is supportive"* ***PNP*** *"After knowing that I am HIV positive, we started using condom. I was pregnant already."* ***PNP***
Measures of adherence	They always kept their treatment in their handbags, some would take it during "Generations" (a television program on SABC1 TV playing at 20h00 from Mon to Fri) that is watched by , some received support from families (partners and children) even if children did not always know that the treatment they are taking is for HIV. Few mothers reported that they sometimes missed taking their dose on a scheduled time if they were away from home and did not take the treatment with, but they would take it as soon as they got home.	"I always keep them in my handbag." **PNP** ***Take ART*** "During generations" **PNP** *"My kids, My first born is 10 years old. At seven she brings my treatment. I had a conversation with her, she knows that seven is scheduled time to take treatment."* ***Does she know what treatment are you taking?*** *"No, I did not tell her. But she is supportive."* **PNP**

Theme	Summary of results	Quotation
Adherence enablers	Good health, self-acceptance, peer support, partner support, family support, and good services from facilities were mentioned as enablers for ART adherence. Taking one tablet (with less or no side effects) a day was also reported as an enabler for adherence.	*"I told my partner and my mother as well as my family. I also told my friends. Everybody knows because most people in my area are positive. It was normal, I carried on talking about it because I knew a few people who were also positive."* ***PM*** *"I think it's better to tell people closer to you because you will be able to take your medication when you have a visitor or people around."* ***PM*** *"I think support groups will help so that mothers can see that they are not alone, and that there are also other people that have issues. It also helps you to know how to deal with the problems and when my friends come and visit, they must sit in the sitting room so that I can have a privacy to go into the bedroom and take the medication."* ***PM*** *"They isolate them, for an example when you are asking for water, they will give you a separate cup which you will not share with other people saying you will infect them."* PNN *"In the community where I am staying, they no longer mind someone who is HIV positive. If someone is HIV positive and stop taking treatment then become sick, the only thing they will say is that they do not feel sorry for this person because he/she has killed himself by not taking treatment. He/she knows that HIV does not kill, but decided not to take treatment. Most of the time they refer to ARVs/treatment as 'data.'"* ***PNN***
Adherence barriers	Stigma, discrimination, side effects, scarcity of food, denial, lack of privacy, lack of support, and non-disclosure were reported as major barriers for non-adherence. Men mentioned that they find it difficult to disclose their HIV positive status to their female	*"They say you must eat when you are taking treatment, so that it can be absorbed well in your body."* ***PNN***

Theme	Summary of results	Quotation
	partners, whereas females would disclose their HIV status to them and encourage them to go for their testing. This is also because male partners know that females get tested for HIV during pregnancy. Clients often did not attend facilities that discriminated clients (separating them from other clients) that are on treatment, since they did not want to be known in their communities that they are taking ART. They preferred to shop around for treatment and used facilities that are far from their communities. Nurses were also not fully trusted with confidentiality and were sometimes seen disrespectful to patients. Participants expressed mixed feelings regarding how communities treat HIV positive people. Some stated that they could discriminate, judge and isolate them, some felt they could be treated differently. Some felt that people with knowledge about their HIV status would start gossiping about them once they default treatment and become sick.	*"It's difficult for some. I have a friend who normally would say she hasn't taken them because she hasn't eaten anything and she would ask me for food and I would give her and then she will take them."* ***PM*** *"Some end up dying because they don't believe that HIV exists. You give her treatment and she does not take it. They see you as a person who is just talking to yourself."* ***PM*** *"some people, once they become aware that they are infected with HIV, they become shocked and fear taking treatment denying that they are already infected, then continue telling herself that she is not infected.* ***PNN*** *"I think the problem becomes when you don't have support and have to hide when taking them, you tend to forget especial from family and friends. They become discouraged."* ***PM*** *"I will talk about the previous place that I used to stay at because I have recently moved to where I am at now. In my community there were no issues and people would talk and joke about it even when they collect their tablets it wasn't an issue. Regardless of whether you are positive or negative."* ***PN*** *"Nurses, nurses talk a lot, we are not protected at all. Nurses talk amongst themselves about your HIV status and sometimes end up telling even other people in the community. Then other people end up knowing about your HIV status including the community you are staying in. Nurses are always gossiping"* ***PNP*** *"Being shy of being seen often at the clinic fetching treatment"* ***PN***

Theme	Summary of results	Quotation
		"Some people do not have a problem but others suddenly treat you differently once they find out that you have HIV and your status might end up being known by everyone in the community." ***PN***
Adolescent care	The majority of adolescent mothers in the focus group mentioned that they did not know their HIV status before they became pregnant. Only one adolescent mother knew her HIV status and her partner's status prior to pregnancy. All the adolescent mothers reported that they shared their HIV status with partners and received a good response from their partner because all partners decided to visit the facility and got tested. Two adolescent mothers reported that their male partners suggested use of condoms after testing to maintain their HIV negative status as a couple. One adolescent mother reported that her partner was angry with her when he told him that she was tested for HIV at the clinic, he was calm after seeing that she tested negative. Another young mother expressed that she wouldn't have disclosed her status to her partner if she tested positive, expressing fear of being killed by her partner. Most adolescent mothers did not plan to have babies except the two who had husbands. Use of condom is mainly decided by male partners even if a woman does not know her partner's HIV status. Use of condom was not consistent even for those that used condoms before they fell pregnant**.**	*"I told him and showed him the results. He was angry but when he saw the forms he was happy to see that am negative."* ***NAM*** ***"****You might tell your partner and only to find that they didn't know and perhaps they might take a bad decision and kill you"* ***NAM*** *"After testing, I told my partner. He also checked after the delivery of the baby and we also went to test together and discovered that we are both negative."* ***NAM*** *"I never used protection. I started to sleep with my partner without a condom when he paid lobola. I was 18. Then after one month I realized that I was pregnant when I didn't see my periods. I bought the pregnancy test and found out that I was pregnant. That's when I started clinic."* ***NAM***
Experiences of adolescent mothers in the school environment	Two young mothers were not attending school when they fell pregnant, two were in grade 12 (matric) and they felt that their schools did not discriminate against them in any way. The teachers were supportive and even granted them permission to attend ANC services at the clinic and would provide them with notes for the work that was done during their absence. One young mother who	*"They only saw me when I was 5 months and I was in matric. It was an Indian school and they were very protective. They told me not to run and not work too hard and asked to tell them when I have cramps or any other issues… they were supportive."* ***NAM***

Theme	Summary of results	Quotation
	was doing grade nine reported that when she fell pregnant, she was stigmatized by both learners and teachers, and the pregnancy affected her school work negatively as she would miss some of the work done in her absence.	*"I told them at school and they made a note of it. They treated me well and was asked to mention if I had issues. They treat you like all the other kids. They would call the ambulance or call your parents if you got sick."* ***NAM*** *"I knew when I was 4 months. The other kids in my class were not treating me right. Each time the teacher walked in they would tell the teacher that I'm pregnant. Without the teacher asking. They would call me names. I also had problems about getting behind with my school work because some teachers would give me the notes and some wouldn't'."* ***NAM***
Challenges of being a young mother	All young mothers thought that looking after a baby was a huge responsibility that was also restricting a mom from being mobile. They complained about sleepless nights taking care of the baby or having to wake up early and prepare the baby before going to school. Lack of support from family or partner was overwhelming and frustrating for young mothers as a result one mother mentioned that she used to take energy drinks at night to keep her awake. One young mother felt that her partner (with 9 years age difference) was abusive to her, he was isolating her from people, would demand cooked food from her and couldn't help with the baby when he is back from work. He would watch TV and threaten to beat her in case the baby gets burnt while cooking holding the baby. Due to these challenges, they all prioritized the use of contraceptives once the baby was 6 months old and mentioned that they will only be sexually active again after their babies turn 6 months.	*"I used to sleep a lot before I had a child. Now I can't sleep because I have to wake up and take care of the baby and the baby wakes up at 4 am to play and sleeps at 7 am. I also had challenges when I had registered for a course and I had to wake up and get ready and also get the baby ready. I also didn't know who I was going to leave the baby with. I couldn't go out with my friends. My boyfriend was supportive though when I went to find a school he offered to look after the baby."* *"When you have a baby and you leave your baby behind they would call you at home and tell you to come back. The baby wakes up at night and they want to play, and also in the morning they sleep when you have to go to school."* ***NAM*** *"When I go out to shop. They would call me to comeback as the baby is crying. Couldn't go to church for practice because I couldn't take the baby with."* ***NAM***

Theme	Summary of results	Quotation
		"It's hard to be a teenage mother. I don't sleep at night. The baby sleeps during the day mostly. The baby makes me cry. I don't have someone to help me with the baby. He says he is busy and he works so I must look after the baby. So I have to drink energy drinks at night to stay awake to be able to look after the baby" ***NAM*** *"My partner doesn't talk to me nicely. He treats me like a toy. He won't even baby sit when I cook I even do washing for him. He is not supportive, maybe he doesn't want the child. If my partner abuses me and doesn't want to take the child what must I do? He says I must put the child down when cooking it doesn't matter even if the child cries because if I cook while holding the baby and I burn the baby he will beat me. He will say he is busy with the TV… he doesn't want people to help. He won't let me talk to other people. He does not listen to me he says he is the boss and bosses me around"* ***NAM***
Quality of MCH/ANC services and retention in care	Quality of service varied. Within the same facilities there were different experiences. Some reported good quality accompanied by good attitude of nurses and some complained about long waiting times which were sometime due to staff shortage or tea/lunch breaks, saying they spend up to 10 hrs in the clinic and sometimes advised to come back the following day for ART treatment (especially in the facilities that are short-staffed and also doing deliveries). Patients also reported that busy facilities also lose their original files and use duplicates to render services. In one facility it was reported that files were lost to an extent that one patient would make new files seven times in a year. This delayed them as they got attended to last when they did not have their patient files. There were also complaints about the attitude	*"Oh, nurses in this clinic are very good, since I am coming from "Bush" my place of origin, since I started visiting this clinic I don't experience problems. I don't feel pain because even if you have something that I don't understand, I am able to ask and they respond well, they won't treat me badly because I am coming from Bushbuckridge. They don't ask why I come here because I started antenatal care at home. They treat me really well here. This is why I prefer to come here. I am coming from clinic X. I pass the hospital there because here they are treating me well and I feel free because I am able to ask them about anything. I don't fear them and they respond well too."* ***PNN*** *"Yes if you came for immunizations today and the doctor has to go to maternity, you won't get ARVs. You have to come back the following day because the doctor that is attending to you has to deliver*

Theme	Summary of results	Quotation
	of nurses not responding to emergencies or not responding well to patients when they are asked questions. The majority of women, including an adolescent woman, mentioned that they started ANC late because of avoiding long waiting times saying they would come at 6h00 or 7h00 and only start receiving help at 14h00, 2 postnatal women in 1 focus group, reported that they left the clinic in the afternoon without getting help and were advised to come the following day and this was costly for them as they were taking taxis getting to the clinic. Some women started ANC late because they feared bad treatment by HCW. One woman shared that she experienced a nurse shouting at an adolescent pregnant woman for being pregnant at her age in front of everyone in the waiting room. The booking system itself also contributed to late booking, clients were given a date for 1st ANC a month after her 1st visit to the clinic. Overall, majority of women on PMTCT program reported good quality of services compared to HIV negative women. Privacy was not always maintained especially in the facilities where they separated HAART patients from other patients. Isolation of HAART services from other services was seen as discrimination stigmatizing people on HAART while promoting defaulter rate as people are not comfortable being seen by their communities fetching HAART from the clinic. Clients also complained about facilities that sometimes exposed children to infectious adults.	*someone at the maternity ward while you came to weigh the baby and maternity checkup." PNP* *"The service is very slow when you are pregnant. You can go home around 16h00 or 17h00. They take their tea break and leave you sitting and waiting. Again they take lunch for an hour and leave you sitting and waiting. It is very slow. By the time we go home we are feeling very hungry, and also feeling that the baby is also hungry and not even moving well."* ***PNN*** *"If you are turned away, you are told to arrive early at 5 in the morning the following day so that you don't join the queue, but sometimes you find other people who arrived before you because we are many. Then it depends, if the nurse wants to attend you after you explained that you were there a day before. If you are lucky, may be the nurse saw you, then she will attend you and first give you your treatment. It does not matter whether you arrive at 5 because if someone who is in labour comes in at 7h00, they will leave you and attend to her first."* ***PNP*** *"Their service is poor. If I am sick and they can see that I am sick such that I am struggling to get where I must fetch treatment, they will force me to move where I am seating and follow them until I get to where I should get my treatment or sometimes even if they have seen that I am very sick, she would still go on lunch, leaving me there feeling pain, because I am waiting for treatment and I need their help."* ***PNN-MP*** *"It was not a big problem for me because sometimes when you get here at the clinic, it depends on the nurses that you deal with. Sometimes they treat you well…Sometimes you are told to come the*

Theme	Summary of results	Quotation
		following day for treatment. If you are collecting treatment, you do not always get it. For instance, it happened twice that I had to come for treatment because of staff shortage." ***PNP*** *"It is a good thing because we all use one queue. We are all the same. You would not ask who is sick with what. We are not separated according to diseases. They do not say, HIV positive people should use this queue. We all queue in one line and it ends there."* ***PNN*** *"Besides our lost files, they are giving us file duplicates. We don't get our files. Since I started bringing my baby for immunization, I never received my original file. We don't know where they are"* ***PNP*** *"Personally, I never experienced a problem, I usually get attended immediately and go home. Even today. I got registered immediately after I arrived, they weighed the baby and then I went for and injection/immunization."* ***PNN*** *"I started the clinic when I was 6 months because at home they discovered when I was 4 months. I was also afraid because the nurses don't treat us well at the clinic…They don't talk to us nicely*" ***NAM*** *They hide our status. They speak well; they don't shout so that the next person overhears what kind of sickness you have or whether you are sick or not. They speak properly to you and they counsel you. They do that very well."* ***PNP*** *"You don't get help on your first visit, you are given a date for the following month to start clinic."* ***PN****"I was avoiding to come because I know the nurses were going to scold me. I only came because of the blood tests. If it wasn't for it, I wouldn't have come,"* ***PN***

Theme	Summary of results	Quotation
		"Because most people were treated badly when I had my first child, so I didn't want to be scolded. My plan was never to come to the clinic. I am using a private doctor. My parents insisted that I come because I would need a clinic card when giving birth. Nurses make us feel inferior." ***PN***
Male partners views about PMTCT	Some male partners viewed the program as a good program stating that babies get prevented from HIV infection through this program. There were also misconceptions around testing and infant feeding practices. Some men assumed that if their partners tested HIV negative, then they would also test HIV negative before they have done their own HIV test. One male partner also reported that HIV positive mothers cannot breastfeed their babies because they will transmit HIV to the baby. Some partners expressed concerns that their partners were forced to test when they were pregnant and did not receive counselling before they were tested. Some did not trust that HCWs would be able to maintain confidentiality for client's HIV status. One male partner was concerned that his partner was denied re-testing services after delivery and claimed that HCWs advised her to go back to the clinic where she attended ANC services whereas she has relocated. One male participant had knowledge with gaps about PrEP. His source for PrEP information was a TAC activist.	"*I support it because one of the key things is that if a woman got tested it means I am also fine and that suits me to ensure that the baby is born HIV negative because I think when our women fall pregnant, they take care of themselves, so it is also my responsibility to ensure that I don't fool around and infect her with AIDS, you see, or STIs, you see, so that when this baby is born, in case I am no longer working. She is able to breastfeed, because once she is HIV positive, she cannot breastfeed, you see. So this is good, so that our statistics is managed through this process because we men are scared to visit the clinic for testing, so if a woman is tested I know that I am also negative" Male partner* *"yes, from my experience I also know that it is given that when you are pregnant, you have to test. It is given that you don't have a choice" Male partner "she doesn't not have a choice (to be tested) so my other concern is if this thing is confidential? but sometimes you find out, I think nurses themselves go to your family and discuss that so and so is HIV positive, you see. I think they are unable to keep it as a secret. I heard them talking, saying someone is so and so" Male partner* *"oh what I can say is that initially my partner started visiting clinic at XXX (place of origin), but because she is a student here at UMP, there is a residence here and when she is not feeling well or it's her clinic*

Theme	Summary of results	Quotation
		scheduled date she should come here and for every consultation they have to maintain her status by testing her. They turned her away in this clinic saying they will not test her, she should go back to XXX (place of origin) and in that regard she is a student. It is an expense because she is close here. It makes sense to visit this clinic than travelling to XXX (place of origin). So that is a problem, being turned away when even a babies card is operational nationally, so why turning her away when at XXX (place of origin) they tested her and here they refused to test her" Male partner *"It is a good thing to take them (ART) for life, there are HIV positive people who have been taking treatment for 20 years, but you can't tell (that they are HIV positive). They look healthy and they are living normal life."* ***MP***
Male involvement and support	The majority of women complained about partners not supporting them financially and physically. Their partners would not accompany them during ANC and postnatal period, do not want to be tested for HIV, and often refuse using condom. Male partners of women in PMTCT programs responded better to testing and those that tested positive were initiated on ART and reported safe sex practices. Some of the men that were already in treatment did not disclose their HIV positive status until a woman disclosed, and some of whom were on treatment for more than a year. HIV negative women perceived themselves being exposed to the risk of HIV infection, since they did not fully trust their partners especially those that consume alcohol. HIV negative post-natal women reported fear of discrimination by male partners had women tested HIV positive.	*"We used to fight about money for transport to the clinic, including money for food. I should feed the baby while I am pregnant, but we used to fight because he is refusing to give me money…he wanted a baby, but he had a problem when he had to give me money. As for money! We would fight even when we have to buy pampers. He would say he does not have money but he is working. I don't understand, he would always say he does not have money every time u ask money for something. He would give you money once in a while, only once, mine gave me money in January only."* ***PNN*** *"Wow men they don't like being tested. When you are talking to him about testing, he agrees, but when it's time to go for testing, he will tell you about a priority place that he wants to go to and end up not going there telling you that he will go some other time. Then you force him to use condom, he would have a problem with that as well*

Theme	Summary of results	Quotation
	Male partners of HIV negative women were seen resistant to testing for HIV, (claiming to know their status, fear of needles, avoid visiting the health facility) but they often refused to use condoms. Some mother stated that even when attempting to bring a home test kits, their partner refused testing. Few (not all men in the FGDs) reported that they tested before they planned to have babies, others did not know their status. They also stated that condom is commonly used consistently for the first 3-4 months being in the relationship and they often do not use a condom when the woman is pretty. The majority of men mentioned that a condom causes discomfort, hence they find it difficult to use it consistently. Men also reported that few females would sometimes refuse condom use without knowing male partners status because they are solely planning to be pregnant with the intention to hold the man accountable for financial support. Partner's violence was reported by 2 females experienced during pregnancy and post-natal period and one of these females was an adolescent mother. Through continuous education and availability of ART some men are beginning to see the importance and benefits of testing.	*because when you are pregnant you have to use condom so that you protect the baby from being infected with diseases because, you may not be the only one. A man always lies, telling you that you are the only partner he is in love with then he goes and visit another partner."* ***PNN*** *"Men do not test for their statuses and they blame you for the disease. They are afraid of coming to the clinic because they will get tested."* ***PNN*** ***"****when she's too pretty, looking great, you just tell yourself that here I'm not using a condom" Male partner* *"Men are troublesome and they are selfish, because one knows that he has many relationships outside your relationship. When he is visiting you, he should protect you, but he does not want to use a condom. Most men are inconsiderate when it comes to their families."* ***PNN*** *"my partner told me that she is HIV positive and is on treatment, we were using condom all the time as we were in the relationship for 2 years. With time, when I'm drunk I would not use condom and I ended up being infected and I could not blame her." Male partner* *"I tested positive and I did not disclose my status for a year being on treatment, and I would take treatment before she visits…we were sometimes not using condom, later I decided to disclose because this affected me on how I took my treatment." Male partner* *"They make you feel like you are nothing. Personally, when I was pregnant, my partner was not treating me well at all, I was crying*

Theme	Summary of results	Quotation
		most of the time. He was not taking care of me/he was ignoring me." ***PNN*** *"I feel I am sometimes at risk. I do not know my partner's status and I do not know where he is right now or what he's getting up to; when he comes to visit me we do not use condoms and that means I may get it."* ***PNN*** *"Most of the time you end up fighting. My partner and I used to fight a lot until I decided that we should no longer have sex because I don't know the places he visits, I am not always with him and I don't trust what he is telling me because I want to trust what I see****." PNN***

IP: Implementing partner; PHC: Primary health care; MP: Mpumalanga; PM – Pregnant mother; PNN – Post-natal negative mother; PNP – Post-natal positive mother; NAM – Negative adolescent mother;

APPENDIX 6: HEALTH CARE WORKER SELF-REPORTED PMTCT PRACTICES IN FACILITIES. Recommended practices highlighted in bold

Characteristic	EC_ORTambo		GP_Ekurhuleni		KZN_eThekwini		LP_GSekhukhune		MP_Ehlanzeni		NW_Bojanala		p-value
		% (95% CI)		% (95% CI)		% (95% CI)		% (95% CI)		% (95% CI)		% (95% CI)	
	N=148		**N=146**		**N=94**		**N=194**		**N=126**		**N=166**		
All HIV positive women are initiated onto ART without waiting for blood test results													
Yes	**130**	**87.8 [79.9,92.9]**	**135**	**92.5 [86.3,96.0]**	**87**	**92.6 [83.0,96.9]**	**166**	**85.6 [77.7,91.0]**	**114**	**90.5 [83.3,94.8]**	**139**	**84.2 [77.0,89.5]**	
No	18	12.2 [7.1,20.1]	8	5.5 [2.3,12.6]	3	3.2 [1.1,9.1]	23	11.9 [7.4,18.4]	11	8.7 [4.6,16.1]	21	12.7 [8.2,19.3]	p=0.121
Don't know	0	0	3	2.1 [0.7,5.8]	4	4.3 [1.3,13.0]	5	2.6 [1.2,5.6]	1	0.8 [0.1,5.4]	5	3.0 [1.4,6.6]	
HIV negative women are re-tested 3 monthly													
Yes	**131**	**88.5 [80.9,93.4]**	**125**	**86.2 [78.1,91.6]**	**85**	**90.4 [81.6,95.3]**	**152**	**78.4 [70.4,84.6]**	**90**	**71.4 [62.5,79.0]**	**137**	**82.5 [73.5,89.0]**	
No	16	10.8 [6.0,18.7]	17	11.7 [6.2,20.9]	6	6.4 [3.1,12.7]	39	20.1 [13.6,28.8]	33	26.2 [18.1,36.3]	25	15.1 [8.7,24.8]	**p=0.028**
Don't know	1	0.7 [0.1,4.5]	3	2.1 [0.7,5.8]	3	3.2 [0.8,12.4]	3	1.5 [0.5,4.5]	3	2.4 [0.8,6.7]	4	2.4 [1.0,5.7]	
Viral load testing is done on all HIV positive mothers/pregnant women													
Yes	**140**	**95.2 [89.9,97.8]**	**132**	**91 [84.9,94.8]**	**92**	**97.9 [85.5,99.7]**	**182**	**94.3 [90.1,96.8]**	**117**	**93.6 [87.9,96.7]**	**153**	**92.2 [86.8,95.4]**	
No	5	3.4 [1.2,9.6]	9	6.2 [3.1,11.9]	0	0	8	4.1 [1.9,8.7]	6	4.8 [2.1,10.7]	5	3 [1.4,6.5]	p=0.441
Don't know	2	1.4 [0.4,4.8]	4	2.8 [1.1,6.5]	2	2.1 [0.3,14.5]	3	1.6 [0.5,4.4]	2	1.6 [0.4,6.0]	8	4.8 [2.1,10.5]	
CD4 cell count is done on all HIV positive mothers/pregnant women													
Yes	**140**	**95.2 [90.1,97.8]**	**138**	**94.5 [86.8,97.8]**	**87**	**92.6 [81.8,97.2]**	**180**	**92.8 [85.4,96.6]**	**111**	**88.1 [81.8,92.4]**	**150**	**90.4 [82.1,95.0]**	
No	6	4.1 [1.7,9.5]	5	3.4 [1.1,10.4]	4	4.3 [1.3,12.7]	12	6.2 [2.6,14.1]	11	8.7 [4.9,15.1]	8	4.8 [2.5,9.1]	p=0.479
Don't know	1	0.7 [0.1,4.3]	3	2.1 [0.7,5.8]	3	3.2 [0.7,12.7]	2	1 [0.3,3.8]	4	3.2 [1.0,9.6]	8	4.8 [1.4,15.3]	

Characteristic	EC_ORTambo		GP_Ekurhuleni		KZN_eThekwini		LP_GSekhukhune		MP_Ehlanzeni		NW_Bojanala		p-value
		% (95% CI)		% (95% CI)		% (95% CI)		% (95% CI)		% (95% CI)		% (95% CI)	
All mothers are followed up after 6 months on ARVs													
Yes	**104**	**70.3 [58.6,79.8]**	**81**	**55.5 [47.8,62.9]**	**54**	**57.4 [47.6,66.8]**	**97**	**50.0 [39.9,60.1]**	**72**	**57.6 [49.1,65.7]**	**109**	**65.7 [56.6,73.7]**	
No	37	25.0 [16.9,35.3]	52	35.6 [28.4,43.5]	36	38.3 [27.9,49.8]	88	45.4 [35.0,56.2]	49	39.2 [31.2,47.8]	48	28.9 [20.7,38.7]	p=0.068
Don't know	7	4.7 [1.7,12.2]	13	8.9 [5.6,13.8]	4	4.3 [1.2,14.3]	9	4.6 [2.2,9.6]	4	3.2 [1.0,9.5]	9	5.4 [2.5,11.6]	
All mothers are asked to come back after 12 months on ARVs													
Yes	**53**	**35.8 [28.3,44.1]**	**40**	**27.6 [19.9,36.9]**	**29**	**30.9 [23.0,40.0]**	**51**	**26.3 [18.8,35.5]**	**33**	**26.2 [18.2,36.2]**	**58**	**34.9 [26.0,45.0]**	
No	90	60.8 [51.6,69.3]	95	65.5 [56.1,73.9]	61	64.9 [55.5,73.3]	134	69.1 [59.2,77.5]	85	67.5 [55.9,77.2]	98	59 [48.1,69.2]	p=0.728
Don't know	5	3.4 [1.4,8.1]	10	6.9 [4.1,11.3]	4	4.3 [1.2,13.7]	9	4.6 [2.1,10.1]	8	6.3 [3.0,13.0]	10	6 [2.8,12.6]	
All HIV exposed infants are tested at birth													
Yes	**127**	**86.4 [78.2,91.8]**	**126**	**86.9 [79.9,91.7]**	**81**	**86.2 [73.4,93.4]**	**185**	**95.4 [85.6,98.6]**	**121**	**96 [89.6,98.5]**	**145**	**87.3 [82.3,91.1]**	
No	18	12.2 [7.3,19.9]	12	8.3 [5.1,13.2]	10	10.6 [5.0,21.2]	6	3.1 [0.8,11.3]	5	4 [1.5,10.4]	18	10.8 [7.2,16.0]	p=0.098
Don't know	2	1.4 [0.4,5.0]	7	4.8 [2.3,9.8]	3	3.2 [0.8,12.4]	3	1.5 [0.2,10.0]	0	0	3	1.8 [0.6,5.0]	
All HIV exposed infants are tested at six weeks													
Yes	87	59.2 [47.6,69.8]	72	50.3 [41.6,59.1]	40	42.6 [30.7,55.3]	80	41.2 [32.7,50.3]	46	36.5 [27.6,46.4]	79	47.6 [39.6,55.7]	
No	**59**	**40.1 [29.3,52.0]**	**66**	**46.2 [37.2,55.4]**	**51**	**54.3 [42.3,65.8]**	**111**	**57.2 [48.2,65.8]**	**79**	**62.7 [52.9,71.5]**	**78**	**47 [38.3,55.9]**	**p=0.015**
Don't know	1	0.7 [0.1,4.4]	5	3.5 [1.4,8.5]	3	3.2 [0.7,13.3]	3	1.5 [0.5,4.5]	1	0.8 [0.1,5.4]	9	5.4 [2.5,11.4]	
All HIV exposed infants are tested at 10 weeks													
Yes	**104**	**70.7 [61.6,78.5]**	**117**	**80.7 [71.6,87.4]**	**77**	**81.9 [66.7,91.1]**	**171**	**89.1 [81.4,93.8]**	**111**	**88.1 [81.9,92.4]**	**125**	**75.8 [67.3,82.6]**	**p=0.019**
No	33	22.4 [15.3,31.6]	17	11.7 [6.6,19.9]	14	14.9 [6.4,31.1]	19	9.9 [5.7,16.8]	12	9.5 [5.9,15.0]	29	17.6 [11.4,26.2]	

Characteristic	EC_ORTambo		GP_Ekurhuleni		KZN_eThekwini		LP_GSekhukhune		MP_Ehlanzeni		NW_Bojanala		p-value
		% (95% CI)		% (95% CI)		% (95% CI)		% (95% CI)		% (95% CI)		% (95% CI)	
Don't know	10	6.8 [3.5,12.7]	11	7.6 [5.0,11.4]	3	3.2 [0.7,13.5]	2	1 [0.3,3.9]	3	2.4 [0.8,6.6]	11	6.7 [3.1,13.8]	
All HIV exposed infants are tested at 16 weeks													
Yes	49	33.6 [24.9,43.5]	46	32.2 [23.7,42.1]	25	26.6 [17.5,38.2]	29	14.9 [9.8,22.1]	13	10.3 [6.5,16.0]	34	20.6 [14.9,27.9]	
No	**85**	**58.2 [47.8,67.9]**	**79**	**55.2 [47.3,62.9]**	**63**	**67.0 [55.3,76.9]**	**150**	**77.3 [70.3,83.1]**	**106**	**84.1 [75.8,89.9]**	**114**	**69.1 [59.1,77.6]**	**p<0.0001**
Don't know	12	8.2 [4.9,13.4]	18	12.6 [7.9,19.4]	6	6.4 [2.8,13.9]	15	7.7 [4.2,13.8]	7	5.6 [2.7,11.1]	17	10.3 [5.5,18.4]	
All HIV exposed infants are tested at 18 months													
Yes	**124**	**84.9 [76.4,90.7]**	**132**	**91.7 [87.7,94.4]**	**85**	**90.4 [82.2,95.1]**	**183**	**94.3 [89.6,97.0]**	**118**	**93.7 [86.9,97.0]**	**138**	**84.1 [76.2,89.8]**	
No	17	11.6 [7.0,18.8]	4	2.8 [1.1,6.6]	5	5.3 [2.4,11.3]	7	3.6 [1.7,7.5]	4	3.2 [1.3,7.8]	14	8.5 [4.7,15.1]	**p=0.021**
Don't know	5	3.4 [1.6,7.0]	8	5.6 [3.0,10.1]	4	4.3 [1.4,12.1]	4	2.1 [0.7,6.3]	4	3.2 [1.0,9.5]	12	7.3 [3.2,15.8]	
All infants regardless of HIV exposure are tested at 18 months													
Yes	**96**	**65.8 [55.5,74.7]**	**67**	**47.9 [36.6,59.3]**	**73**	**77.7 [67.1,85.6]**	**121**	**62.7 [51.2,72.9]**	**113**	**89.7 [81.9,94.3]**	**115**	**69.7 [61.8,76.6]**	
No	40	27.4 [19.8,36.6]	63	45 [33.9,56.6]	17	18.1 [11.6,27.1]	65	33.7 [24.2,44.6]	11	8.7 [4.2,17.1]	39	23.6 [16.5,32.6]	**p=<0.0001**
Don't know	10	6.8 [3.3,13.6]	10	7.1 [3.8,13.1]	4	4.3 [1.2,14.3]	7	3.6 [1.3,9.7]	2	1.6 [0.4,5.9]	11	6.7 [3.6,12.0]	
All HIV exposed infants are tested six weeks after breastfeeding stops													
Yes	**127**	**86.4 [79.3,91.3]**	**125**	**86.2 [80.4,90.5]**	**85**	**90.4 [79.9,95.7]**	**168**	**86.6 [78.7,91.9]**	**101**	**80.2 [72.7,86.0]**	**140**	**84.3 [78.1,89.0]**	
No	13	8.8 [4.8,15.8]	12	8.3 [5.3,12.7]	5	5.3 [1.9,14.0]	19	9.8 [5.4,17.0]	16	12.7 [8.1,19.3]	17	10.2 [5.8,17.3]	p=0.839
Don't know	7	4.8 [2.1,10.6]	8	5.5 [2.9,10.1]	4	4.3 [1.3,12.7]	7	3.6 [1.9,6.7]	9	7.1 [3.7,13.3]	9	5.4 [2.6,11.2]	
Breastfeeding for up to 2 years is supported for HIV exposed infants as long as their mothers are on ART and virally suppressed													
Yes	**101**	**68.7 [59.3,76.8]**	**118**	**81.4 [73.6,87.2]**	**74**	**78.7 [69.8,85.5]**	**144**	**74.2 [63.3,82.8]**	**100**	**79.4 [69.9,86.4]**	**110**	**66.3 [57.6,74.0]**	p=0.065

Characteristic	EC_ORTambo		GP_Ekurhuleni		KZN_eThekwini		LP_GSekhukhune		MP_Ehlanzeni		NW_Bojanala		p-value
		% (95% CI)		% (95% CI)		% (95% CI)		% (95% CI)		% (95% CI)		% (95% CI)	
No	36	24.5 [17.7,32.8]	19	13.1 [8.5,19.7]	11	11.7 [5.7,22.5]	45	23.2 [15.0,34.1]	19	15.1 [9.1,23.9]	44	26.5 [19.2,35.3]	
Don't know	10	6.8 [3.5,12.8]	8	5.5 [2.9,10.2]	9	9.6 [4.6,18.9]	5	2.6 [1.0,6.5]	7	5.6 [2.9,10.3]	12	7.2 [3.0,16.3]	
HIV positive mothers mixed feeding, are immediately told to stop breastfeeding													
Yes	132	89.8 [81.8,94.5]	115	79.3 [71.7,85.3]	53	56.4 [43.9,68.1]	133	68.6 [59.3,76.5]	83	65.9 [56.2,74.4]	112	67.5 [58.7,75.2]	
No	**13**	**8.8 [4.5,16.5]**	**24**	**16.6 [10.7,24.8]**	**33**	**35.1 [23.9,48.3]**	**50**	**25.8 [19.2,33.6]**	**38**	**30.2 [22.1,39.6]**	**44**	**26.5 [18.5,36.5]**	**p<0.0001**
Don't know	2	1.4 [0.4,4.9]	6	4.1 [2.1,7.9]	8	8.5 [3.8,17.8]	11	5.7 [2.6,11.7]	5	4 [1.5,10.1]	10	6 [3.3,10.6]	
Mothers/caregivers usually bring their Road to Health Books to the clinic													
Yes	141	95.9 [90.2,98.4]	134	92.4 [87.7,95.4]	86	91.5 [84.0,95.7]	189	97.4 [91.4,99.3]	121	96 [91.5,98.2]	154	93.3 [88.6,96.2]	
No	5	3.4 [1.4,8.3]	7	4.8 [2.4,9.5]	4	4.3 [1.6,10.7]	1	0.5 [0.1,3.5]	3	2.4 [0.8,6.7]	7	4.2 [2.0,8.9]	p=0.413
Don't know	1	0.7 [0.1,4.5]	4	2.8 [1.1,6.5]	4	4.3 [1.3,13.4]	4	2.1 [0.5,8.8]	2	1.6 [0.4,5.9]	4	2.4 [1.0,5.7]	
Mothers started on ART during ANC come back for postnatal ART follow-up at this clinic postnatally													
Yes	**132**	**89.8 [82.1,94.4]**	**130**	**89.7 [85.3,92.8]**	**87**	**92.6 [84.0,96.7]**	**179**	**92.3 [86.6,95.7]**	**113**	**89.7 [83.6,93.7]**	**150**	**91.5 [84.7,95.4]**	
No	4	2.7 [0.7,9.6]	9	6.2 [3.9,9.6]	1	1.1 [0.2,6.0]	5	2.6 [1.2,5.6]	2	1.6 [0.4,6.0]	7	4.3 [2.1,8.5]	p=0.413
Don't know	11	7.5 [3.8,14.4]	6	4.1 [1.8,9.5]	6	6.4 [2.4,16.1]	10	5.2 [2.2,11.4]	11	8.7 [4.9,15.0]	7	4.3 [1.7,10.2]	

EC = Eastern Cape; GP = Gauteng; KZN –KwaZulu Natal; LP=Limpopo; MP=Mpumalanga; NW = North West. n=total number

Note responses for each question may not add up to the total because some responses were missing, and in some tables where only two options were possible the table reports on one of the options.

APPENDIX 7: HEALTH CARE WORKER KNOWLEDGE OF WHEN TO INITIATE LIFELONG ART REGARDLESS OF CD4 CELL COUNT: CORRECT ANSWERS HIGHLIGHTED IN BOLD

	EC_ORTambo (n=198		**GP_Ekurhuleni (n=146)**		**KZN_eThekwini (n=95)**		**LP_GSekhukhune (n=194)**		**MP_Ehlanzeni (n=125)**		**NW_Bojanala (n=164)**		**p-value**
	n	**% (95% CI)**	**n**	**% (95% CI)**	**n**	**% (95% CI)**	**n**	**% (95% CI)**	**n**	**% (95% CI)**	**n**	**% (95% CI)**	
Initiating lifelong ART regardless of CD4 cell count is needed for													
HIV-positive pregnant, breastfeeding women, or women within 1 year postpartum for life													
Yes	**111**	**75.0 [63.2,84.0]**	**121**	**82.9 [75.0,88.6]**	**76**	**80.9 [72.5,87.1]**	**154**	**79.4 [73.7,84.1]**	**99**	**79.2 [70.0,86.1]**	**137**	**83.5 [77.1,88.4]**	
No	21	14.2 [7.7,24.8]	11	7.5 [3.6,15.2]	7	7.4 [4.0,13.4]	23	11.9 [8.0,17.2]	15	12 [6.9,20.1]	12	7.3 [3.9,13.2]	p=0.762
Don't know	16	10.8 [5.4,20.5]	14	9.6 [6.4,14.1]	11	11.7 [6.7,19.7]	17	8.8 [5.0,15.0]	11	8.8 [4.5,16.4]	15	9.1 [5.7,14.4]	
HIV-positive women who attend for choice of termination of pregnancy (CTOP) (included in the 2015 PMTCT training package)													
Yes	**81**	**55.9 [47.3,64.1]**	**90**	**63.4 [54.8,71.2]**	**64**	**68.1 [55.1,78.8]**	**131**	**67.5 [60.8,73.6]**	**68**	**54.4 [44.8,63.7]**	**103**	**62.4 [53.9,70.2]**	
No	20	13.8 [9.7,19.2]	8	5.6 [3.4,9.3]	10	10.6 [6.3,17.5]	20	10.3 [6.8,15.3]	13	10.4 [5.9,17.7]	15	9.1 [5.8,14.1]	p=0.131
Don't know	44	30.3 [24.0,37.5]	44	31 [23.9,39.0]	20	21.3 [13.7,31.5]	43	22.2 [16.0,29.8]	44	35.2 [26.8,44.6]	47	28.5 [20.6,38.0]	
HIV-positive children													
Yes	**116**	**80 [72.7,85.7]**	**119**	**81.5 [73.8,87.3]**	**80**	**85.1 [76.9,90.8]**	**159**	**82.4 [76.4,87.1]**	**93**	**74.4 [67.9,79.9]**	**136**	**84 [76.8,89.2]**	
No	12	8.3 [5.2,13.0]	6	4.1 [1.9,8.8]	7	7.4 [4.4,12.4]	13	6.7 [3.2,13.5]	14	11.2 [6.7,18.1]	12	7.4 [3.9,13.5]	p=0.447
Don't know	17	11.7 [6.4,20.4]	21	14.4 [9.4,21.4]	7	7.4 [3.7,14.5]	21	10.9 [7.5,15.5]	18	14.4 [10.2,19.9]	14	8.6 [4.5,16.1]	
HIV/TB or HIV/hepatitis B co-infected women.													
Yes	**113**	**79.0 [70.6,85.5]**	**112**	**77.2 [69.3,83.6]**	**79**	**84 [72.5,91.3]**	**148**	**76.3 [68.8,82.4]**	**93**	**73.8 [62.8,82.4]**	**136**	**81.9 [74.9,87.3]**	
No	19	13.3 [8.1,21.0]	17	11.7 [6.6,20.0]	7	7.4 [3.1,16.9]	19	9.8 [5.4,17.1]	19	15.1 [8.9,24.4]	16	9.6 [6.4,14.3]	p=0.638

	EC_ORTambo (n=198		**GP_Ekurhuleni (n=146)**		**KZN_eThekwini (n=95)**		**LP_GSekhukhune (n=194)**		**MP_Ehlanzeni (n=125)**		**NW_Bojanala (n=164)**		**p-value**
	n	**% (95% CI)**	**n**	**% (95% CI)**	**n**	**% (95% CI)**	**n**	**% (95% CI)**	**n**	**% (95% CI)**	**n**	**% (95% CI)**	
Don't know	11	7.7 [4.3,13.3]	16	11 [7.0,16.9]	8	8.5 [4.0,17.2]	27	13.9 [9.9,19.2]	14	11.1 [6.6,18.2]	14	8.4 [4.5,15.2]	
All HIV positive men and women even if they are not pregnant													
Yes	**123**	**84.8 [77.6,90.0]**	**124**	**85.5 [77.6,91.0]**	**82**	**87.2 [79.8,92.2]**	**165**	**85.1 [79.2,89.5]**	**103**	**82.4 [74.5,88.2]**	**141**	**84.9 [77.8,90.1]**	
No	13	9.0 [5.1,15.2]	9	6.2 [2.8,13.4]	5	5.3 [2.6,10.7]	18	9.3 [5.6,15.1]	11	8.8 [4.2,17.5]	14	8.4 [5.1,13.6]	p=0.963
Don't know	9	6.2 [3.0,12.6]	12	8.3 [5.1,13.2]	7	7.4 [3.7,14.4]	11	5.7 [3.2,9.8]	11	8.8 [5.0,15.1]	11	6.6 [3.3,13.0]	

EC = Eastern Cape; GP = Gauteng; KZN –KwaZulu Natal; LP=Limpopo; MP=Mpumalanga; NW = North West. n=total number

Note responses for each question may not add up to the total because some responses were missing, and in some tables where only two options were possible the table reports on one of the options.

APPENDIX 8: HEALTH CARE WORKER KNOWLEDGE OF INFANT HIV TESTING GUIDELINES, AS PER 2015 SA PMTCT POLICY

Characteristic	EC_ORTambo (n=148)		GP_Ekurhuleni (n=145)		KZN_eThekwini (n=94)		LP_GSekhukhune (194)		MP_Ehlanzeni (n=126)		NW_Bojanala (n=166)		p-value
	n	% (95% CI)	n	% (95% CI)	n	% (95% CI)	n	% (95% CI)	n	% (95% CI)	n	% (95% CI)	
Infant PCR testing to be conducted at:													
Birth, or as soon as possible after birth amongst all HIV exposed infants													
Yes	**134**	**90.5 [84.0,94.6]**	**128**	**88.3 [82.6,92.3]**	**86**	**91.5 [79.3,96.8]**	**189**	**97.4 [93.4,99.0]**	**115**	**91.3 [84.2,95.4]**	**146**	**88.5 [83.1,92.3]**	
No	5	3.4 [1.4,8.1]	11	7.6 [4.4,12.7]	7	7.4 [2.4,21.0]	3	1.5 [0.5,4.4]	7	5.6 [2.6,11.5]	13	7.9 [4.9,12.5]	p=0.060
Don't know	9	6.1 [3.7,9.9]	6	4.1 [1.8,9.3]	1	1.1 [0.2,6.6]	2	1 [0.3,3.8]	4	3.2 [1.3,7.6]	6	3.6 [1.3,9.8]	
6 weeks													
Yes	75	51 [42.9,59.0]	75	52.4 [43.1,61.6]	45	47.9 [35.8,60.2]	87	45.1 [36.4,54.0]	43	34.1 [25.7,43.7]	90	54.9 [44.6,64.8]	
No	60	40.8 [33.3,48.8]	62	43.4 [34.8,52.4]	48	51.1 [38.7,63.3]	102	52.8 [43.5,62.0]	78	61.9 [52.1,70.9]	67	40.9 [31.9,50.5]	**p=0.029**
Don't know	12	8.2 [4.9,13.3]	6	4.2 [2.1,8.1]	1	1.1 [0.1,7.6]	4	2.1 [0.8,5.0]	5	4 [1.8,8.5]	7	4.3 [1.1,15.7]	
10 weeks in infants not testing HIV positive at birth													
Yes	**98**	**66.2 [55.8,75.3]**	**112**	**77.2 [68.7,84.0]**	**75**	**79.8 [68.4,87.8]**	**153**	**79.3 [71.2,85.5]**	**100**	**79.4 [70.0,86.4]**	**120**	**72.3 [63.7,79.5]**	
No	25	16.9 [11.7,23.7]	15	10.3 [6.3,16.4]	14	14.9 [8.8,24.1]	33	17.1 [11.8,24.1]	20	15.9 [9.8,24.8]	34	20.5 [14.7,27.7]	**p=0.005**
Don't know	25	16.9 [10.6,25.8]	18	12.4 [7.6,19.7]	5	5.3 [2.3,11.9]	7	3.6 [1.9,6.9]	6	4.8 [2.0,10.9]	12	7.2 [3.3,15.3]	
18 weeks in infants receiving 12 weeks nevirapine													
Yes	**82**	**55.8 [46.1,65.1]**	**87**	**60.8 [53.2,68.0]**	**50**	**53.2 [43.6,62.5]**	**115**	**59.9 [51.5,67.7]**	**53**	**42.1 [34.8,49.7]**	**79**	**48.2 [38.5,58.0]**	
No	40	27.2 [20.2,35.6]	30	21 [13.7,30.7]	28	29.8 [21.9,39.0]	56	29.2 [21.4,38.3]	43	34.1 [26.4,42.8]	51	31.1 [23.2,40.3]	p=0.109
Don't know	25	17 [11.3,24.7]	26	18.2 [13.8,23.6]	16	17 [10.9,25.7]	21	10.9 [6.5,17.9]	30	23.8 [16.5,33.2]	34	20.7 [12.6,32.2]	

Characteristic	EC_ORTambo (n=148)		GP_Ekurhuleni (n=145)		KZN_eThekwini (n=94)		LP_GSekhukhune (194)		MP_Ehlanzeni (n=126)		NW_Bojanala (n=166)		p-value
	n	% (95% CI)	n	% (95% CI)	n	% (95% CI)	n	% (95% CI)	n	% (95% CI)	n	% (95% CI)	
6 weeks post cessation of breastfeeding if aged < 18 months and rapid HIV tests if aged ≥ 18 months													
Yes	**111**	**75.5 [64.7,83.8]**	**118**	**80.8 [75.1,85.5]**	**79**	**84 [75.8,89.9]**	**162**	**83.5 [74.6,89.7]**	**95**	**75.4 [68.4,81.3]**	**118**	**71.5 [61.8,79.6]**	
No	11	7.5 [4.2,13.0]	5	3.4 [1.3,8.5]	8	8.5 [4.7,14.8]	16	8.2 [4.3,15.4]	10	7.9 [4.2,14.4]	21	12.7 [7.6,20.5]	p=0.080
Don't know	25	17 [10.6,26.1]	23	15.8 [11.1,21.9]	7	7.4 [3.4,15.7]	16	8.2 [4.7,14.1]	21	16.7 [12.2,22.3]	26	15.8 [9.8,24.3]	
Abandoned children should be tested with a rapid HIV test. If this is positive and they are <18 months old then nevirapine can be started until the HIV PCR test result is returned													
Yes	**109**	**73.6 [63.1,82.0]**	**107**	**73.3 [66.3,79.3]**	**72**	**76.6 [65.7,84.8]**	**149**	**76.8 [68.8,83.3]**	**96**	**76.2 [69.3,81.9]**	**116**	**70.3 [59.8,79.0]**	
No	20	13.5 [8.1,21.8]	19	13 [8.2,20.1]	16	17 [10.9,25.7]	33	17 [11.1,25.1]	16	12.7 [7.4,20.9]	32	19.4 [13.7,26.8]	p=0.481
Don't know	19	12.8 [7.9,20.1]	20	13.7 [8.5,21.3]	6	6.4 [3.3,12.1]	12	6.2 [3.4,11.0]	14	11.1 [6.7,17.9]	17	10.3 [5.6,18.3]	
A second infant HIV PCR test is used to confirm infants HIV infection following the first positive HIV PCR test.													
Yes	**115**	**77.7 [70.8,83.4]**	**109**	**76.8 [69.5,82.7]**	**73**	**77.7 [66.4,85.9]**	**134**	**69.1 [57.1,78.9]**	**95**	**75.4 [64.7,83.6]**	**110**	**66.7 [58.0,74.4]**	
No	19	12.8 [9.1,17.9]	21	14.8 [9.7,21.8]	12	12.8 [6.5,23.6]	49	25.3 [15.6,38.1]	22	17.5 [10.0,28.7]	43	26.1 [18.7,35.0]	p=0.165
Don't know	14	9.5 [5.4,16.0]	12	8.5 [5.3,13.3]	9	9.6 [5.3,16.7]	11	5.7 [2.8,11.2]	9	7.1 [3.9,12.7]	12	7.3 [3.9,13.2]	
A second infant HIV PCR test is needed if the first test is indeterminate or erroneous													
Yes	**117**	**79.6 [70.9,86.2]**	**124**	**84.9 [77.4,90.3]**	**82**	**87.2 [79.4,92.4]**	**160**	**82.5 [75.9,87.6]**	**110**	**87.3 [80.0,92.2]**	**131**	**78.9 [70.0,85.7]**	
No	10	6.8 [3.6,12.5]	13	8.9 [4.7,16.2]	4	4.3 [1.5,11.3]	21	10.8 [6.1,18.6]	10	7.9 [4.4,14.0]	19	11.4 [6.7,18.8]	p=0.253
Don't know	20	13.6 [7.3,24.0]	9	6.2 [3.8,9.8]	8	8.5 [4.4,15.7]	13	6.7 [4.0,11.1]	6	4.8 [2.3,9.5]	16	9.6 [5.4,16.5]	

Characteristic	EC_ORTambo (n=148)		GP_Ekurhuleni (n=145)		KZN_eThekwini (n=94)		LP_GSekhukhune (194)		MP_Ehlanzeni (n=126)		NW_Bojanala (n=166)		p-value
	n	% (95% CI)	n	% (95% CI)	n	% (95% CI)	n	% (95% CI)	n	% (95% CI)	n	% (95% CI)	
Every contact with the healthcare service should be used to ensure that the child's HIV-exposure status is known and documented in the Road-to-Health booklet													
Yes	**126**	**85.7 [75.7,92.0]**	**124**	**86.1 [80.6,90.2]**	**86**	**91.5 [84.3,95.5]**	**170**	**87.6 [80.9,92.2]**	**106**	**84.1 [75.6,90.1]**	**113**	**68.9 [60.3,76.4]**	
No	11	7.5 [3.6,15.0]	15	10.4 [6.0,17.4]	3	3.2 [1.2,8.3]	16	8.2 [4.7,14.0]	13	10.3 [5.6,18.2]	38	23.2 [16.4,31.7]	**p=0.003**
Don't know	10	6.8 [3.4,13.3]	5	3.5 [1.7,7.1]	5	5.3 [2.2,12.4]	8	4.1 [1.7,9.8]	7	5.6 [2.7,11.2]	13	7.9 [2.8,20.7]	
All HIV tests performed, and results obtained should be documented in the Road-to-Health booklet, including the laboratory tracking barcode													
Yes	136	92.5 [85.2,96.4]	130	89.7 [84.0,93.5]	91	96.8 [87.6,99.2]	180	93.3 [88.3,96.2]	112	88.9 [80.4,94.0]	120	72.7 [65.0,79.3]	
No	3	2 [0.5,8.1]	12	8.3 [4.5,14.8]	0	0	10	5.2 [3.2,8.3]	8	6.3 [2.5,15.0]	34	20.6 [13.9,29.5]	**p<0.0001**
Don't know	8	5.4 [2.2,12.9]	3	2.1 [0.7,5.8]	3	3.2 [0.8,12.4]	3	1.6 [0.4,6.2]	6	4.8 [2.3,9.5]	11	6.7 [2.6,15.9]	

EC = Eastern Cape; GP = Gauteng; KZN –KwaZulu Natal; LP=Limpopo; MP=Mpumalanga; NW = North West. n=total number

Note responses for each question may not add up to the total because some responses were missing, and in some tables where only two options were possible the table reports on one of the options.

APPENDIX 9: HEALTH WORKER KNOWLEDGE OF INFANT TREATMENT GUIDELINES AND 2017 UPDATES TO INFANT FEEDING GUIDELINES

Characteristic	EC_ORTambo		GP_Ekurhuleni		KZN_eThekwini		LP_GSekhukhune		MP_Ehlanzeni		NW_Bojanala		p-value
		% (95% CI)		% (95% CI)		% (95% CI)		% (95% CI)		% (95% CI)		% (95% CI)	
	n=148		n=146		n=94		n=194		n=126		n=166		
Viral load monitoring must occur at first ANC if ART is initiated before pregnancy													
Yes	**130**	**87.8 [79.7,93.0]**	**128**	**90.1 [84.2,94.0]**	**85**	**90.4 [83.4,94.7]**	**174**	**89.7 [82.4,94.2]**	**112**	**88.9 [82.5,93.1]**	**144**	**87.8 [82.5,91.7]**	
No	12	8.1 [3.6,17.1]	9	6.3 [3.0,12.9]	7	7.4 [3.9,13.7]	15	7.7 [3.7,15.5]	11	8.7 [5.2,14.2]	13	7.9 [4.5,13.6]	p=0.991
Don't know	6	4.1 [2.1,7.8]	5	3.5 [1.6,7.6]	2	2.1 [0.6,7.7]	5	2.6 [1.0,6.6]	3	2.4 [0.8,6.7]	7	4.3 [2.1,8.7]	
Viral load monitoring must occur within 3 months if ART initiated antenatally or during breastfeeding													
Yes	**115**	**77.7 [67.3,85.5]**	**130**	**89.7 [83.6,93.7]**	**83**	**88.3 [80.8,93.1]**	**162**	**83.9 [73.1,91.0]**	**113**	**89.7 [83.8,93.6]**	**127**	**77 [68.4,83.8]**	
No	26	17.6 [10.7,27.4]	8	5.5 [2.7,11.0]	7	7.4 [3.5,15.3]	24	12.4 [6.6,22.3]	7	5.6 [2.6,11.5]	26	15.8 [10.1,23.7]	**p=0.045**
Don't know	7	4.7 [2.7,8.2]	7	4.8 [2.3,9.9]	4	4.3 [1.7,10.3]	7	3.6 [1.9,6.7]	6	4.8 [2.4,9.3]	12	7.3 [4.2,12.4]	
After the initial viral load test mothers viral load should be monitored 6 monthly													
Yes	**123**	**83.1 [76.6,88.1]**	**108**	**75.5 [67.8,81.9]**	**79**	**84 [73.0,91.1]**	**157**	**80.9 [73.7,86.5]**	**99**	**78.6 [69.2,85.7]**	**132**	**79.5 [72.9,84.9]**	
No	18	12.2 [8.0,18.0]	23	16.1 [10.1,24.7]	14	14.9 [8.6,24.6]	32	16.5 [11.0,24.1]	24	19 [12.2,28.6]	24	14.5 [9.9,20.7]	p=0.241
Don't know	7	4.7 [2.2,9.7]	12	8.4 [4.6,14.8]	1	1.1 [0.2,7.1]	5	2.6 [1.0,6.6]	3	2.4 [0.8,6.8]	10	6.0 [2.9,12.0]	
CD4 cell count is needed to determine ART eligibility in PMTCT													
Yes	69	46.6 [35.5,58.1]	43	29.5 [21.0,39.6]	17	18.1 [9.7,31.1]	54	27.8 [21.6,35.1]	34	27.2 [18.8,37.6]	54	32.5 [24.9,41.2]	
No	**67**	**45.3 [35.0,56.0]**	**90**	**61.6 [54.2,68.6]**	**75**	**79.8 [63.9,89.8]**	**124**	**63.9 [57.4,69.9]**	**79**	**63.2 [52.0,73.1]**	**97**	**58.4 [51.0,65.5]**	**p=0.001**
Don't know	12	8.1 [4.8,13.3]	13	8.9 [5.5,14.0]	2	2.1 [0.4,11.7]	16	8.2 [4.8,13.9]	12	9.6 [5.1,17.2]	15	9 [4.5,17.2]	

Characteristic	EC_ORTambo		GP_Ekurhuleni		KZN_eThekwini		LP_GSekhukhune		MP_Ehlanzeni		NW_Bojanala		p-value
		% (95% CI)		% (95% CI)		% (95% CI)		% (95% CI)		% (95% CI)		% (95% CI)	
	n=148		n=146		n=94		n=194		n=126		n=166		
CD4 cell count needed to identify patients with <200 cells/µL for priority ART initiation													
Yes	**88**	**59.9 [48.0,70.7]**	**57**	**39.0 [31.1,47.7]**	**24**	**25.5 [17.3,36.0]**	**76**	**39.2 [30.9,48.2]**	**54**	**42.9 [33.4,52.8]**	**76**	**45.8 [37.7,54.1]**	
No	51	34.7 [25.4,45.3]	82	56.2 [48.4,63.6]	68	72.3 [60.7,81.6]	106	54.6 [44.9,64.0]	65	51.6 [41.4,61.6]	80	48.2 [42.7,53.7]	**p=0.003**
Don't know	8	5.4 [2.2,12.6]	7	4.8 [2.6,8.6]	2	2.1 [0.6,7.0]	12	6.2 [3.1,12.0]	7	5.6 [2.6,11.4]	10	6 [2.2,15.1]	
CD4 cell count needed to identify patients with <200 cells/µL for priority cotrimoxazole initiation													
Yes	101	68.7 [58.5,77.4]	96	66.2 [58.6,73.1]	72	76.6 [66.3,84.5]	136	70.1 [62.3,76.9]	99	78.6 [69.9,85.3]	108	65.5 [57.5,72.6]	
No	34	23.1 [15.0,33.9]	38	26.2 [18.5,35.8]	17	18.1 [12.1,26.2]	40	20.6 [15.7,26.6]	21	16.7 [10.4,25.6]	40	24.2 [18.1,31.6]	p=0.503
Don't know	12	8.2 [4.9,13.4]	11	7.6 [4.4,12.8]	5	5.3 [2.2,12.2]	18	9.3 [4.9,16.9]	6	4.8 [2.4,9.3]	17	10.3 [5.7,17.9]	
CD4 cell count needed to identify patients with <200 cells/µL to prioritize Cryptococcus infection testing													
Yes	**86**	**58.9 [50.3,67.0]**	**89**	**61.4 [52.5,69.5]**	**58**	**61.7 [51.8,70.7]**	**120**	**61.9 [53.7,69.4]**	**77**	**61.1 [53.7,68.1]**	**94**	**56.6 [48.9,64.0]**	
No	38	26 [19.3,34.1]	39	26.9 [18.9,36.8]	27	28.7 [20.2,39.1]	45	23.2 [17.2,30.5]	33	26.2 [19.1,34.8]	44	26.5 [20.6,33.5]	P=0.927
Don't know	22	15.1 [10.3,21.5]	17	11.7 [8.2,16.4]	9	9.6 [4.4,19.5]	29	14.9 [9.7,22.3]	16	12.7 [8.2,19.2]	28	16.9 [10.8,25.3]	
6-months of exclusive breastfeeding is supported for all infants of HIV positive and negative women													
Yes	**122**	**82.4 [73.3,88.9]**	**129**	**88.4 [83.5,91.9]**	**91**	**96.8 [88.4,99.2]**	**180**	**92.8 [87.3,96.0]**	**111**	**88.1 [82.3,92.2]**	**132**	**80 [71.7,86.3]**	
No	17	11.5 [6.4,19.8]	12	8.2 [5.0,13.3]	2	2.1 [0.6,7.4]	6	3.1 [1.3,7.3]	12	9.5 [6.0,14.9]	21	12.7 [8.2,19.3]	**p=0.011**
Don't know	9	6.1 [2.7,13.1]	5	3.4 [1.4,8.4]	1	1.1 [0.2,6.6]	8	4.1 [1.8,9.2]	3	2.4 [0.8,6.9]	12	7.3 [3.2,15.5]	

Characteristic	EC_ORTambo		GP_Ekurhuleni		KZN_eThekwini		LP_GSekhukhune		MP_Ehlanzeni		NW_Bojanala		p-value
		% (95% CI)		% (95% CI)		% (95% CI)		% (95% CI)		% (95% CI)		% (95% CI)	
	n=148		n=146		n=94		n=194		n=126		n=166		
Continued breastfeeding for up to 2 years is recommended for all infants born to HIV positive women provided the women are virally suppressed													
Yes	**83**	**56.1 [45.3,66.3]**	**101**	**71.6 [63.6,78.5]**	**73**	**77.7 [68.1,85.0]**	**130**	**67 [55.4,76.9]**	**91**	**72.2 [63.1,79.8]**	**94**	**56.6 [46.4,66.3]**	
No	52	35.1 [26.8,44.5]	32	22.7 [16.4,30.6]	15	16 [9.9,24.8]	58	29.9 [19.9,42.3]	30	23.8 [17.2,32.0]	62	37.3 [27.2,48.7]	p=0.058
Don't know	13	8.8 [4.7,15.9]	8	5.7 [2.9,10.9]	6	6.4 [3.0,13.0]	6	3.1 [1.1,8.7]	5	4 [1.5,10.3]	10	6 [2.2,15.7]	
HIV positive mothers should be encouraged to exclusively breastfeed for 6 months with continued breastfeeding up to one year													
Yes	**123**	**83.7 [74.0,90.2]**	**117**	**80.7 [72.1,87.1]**	**81**	**86.2 [73.0,93.5]**	**168**	**86.6 [75.0,93.3]**	**112**	**88.9 [81.5,93.6]**	**141**	**84.9 [76.9,90.5]**	
No	19	12.9 [7.1,22.4]	20	13.8 [8.0,22.8]	10	10.6 [4.9,21.4]	21	10.8 [5.1,21.4]	10	7.9 [4.2,14.5]	21	12.7 [7.6,20.4]	p=0.920
Don't know	5	3.4 [1.5,7.6]	8	5.5 [2.9,10.4]	3	3.2 [0.8,11.5]	5	2.6 [0.7,8.6]	4	3.2 [1.3,7.8]	4	2.4 [1.0,5.8]	
Infant nevirapine could continue for 12 weeks if maternal ART adherence has been suboptimal Or maternal viral load > 1000 copies/µL Or mother is newly diagnosed during breastfeeding													
Yes	**119**	**80.4 [71.0,87.3]**	**106**	**75.2 [68.2,81.0]**	**74**	**78.7 [68.6,86.2]**	**164**	**84.5 [78.0,89.4]**	**93**	**73.8 [64.7,81.3]**	**128**	**77.1 [68.6,83.8]**	
No	10	6.8 [3.0,14.4]	14	9.9 [5.6,17.1]	9	9.6 [5.7,15.7]	14	7.2 [3.9,12.9]	14	11.1 [5.5,21.2]	19	11.4 [7.2,17.7]	p=0.695
Don't know	19	12.8 [7.8,20.5]	21	14.9 [10.8,20.3]	11	11.7 [6.0,21.5]	16	8.2 [4.7,14.2]	19	15.1 [10.1,21.8]	19	11.4 [6.2,20.1]	
For newly diagnosed HIV-positive breastfeeding mothers, infant AZT and nevirapine should be initiated immediately													
Yes	**137**	**92.6 [87.3,95.8]**	**138**	**94.5 [90.6,96.9]**	**86**	**91.5 [85.9,95.0]**	**180**	**92.8 [87.0,96.1]**	**116**	**92.1 [86.5,95.5]**	**148**	**89.2 [81.6,93.8]**	
No	6	4.1 [1.7,9.2]	3	2.1 [0.7,5.9]	3	3.2 [1.1,9.0]	9	4.6 [2.6,8.3]	3	2.4 [0.8,6.8]	9	5.4 [2.7,10.7]	p=0.756

Characteristic	EC_ORTambo		GP_Ekurhuleni		KZN_eThekwini		LP_GSekhukhune		MP_Ehlanzeni		NW_Bojanala		p-value
		% (95% CI)		% (95% CI)		% (95% CI)		% (95% CI)		% (95% CI)		% (95% CI)	
	n=148		n=146		n=94		n=194		n=126		n=166		
Don't know	5	3.4 [1.6,7.2]	5	3.4 [1.6,7.2]	5	5.3 [2.3,11.6]	5	2.6 [0.7,8.6]	7	5.6 [2.9,10.3]	9	5.4 [2.2,12.9]	
If infant PCR is negative, infant AZT can stop; but infant nevirapine should continue for 12 weeks.													
Yes	**109**	**74.1 [63.7,82.4]**	**102**	**70.3 [62.4,77.2]**	**68**	**72.3 [60.1,81.9]**	**141**	**73.1 [65.3,79.6]**	**88**	**69.8 [62.4,76.3]**	**115**	**69.7 [61.4,76.9]**	
No	16	10.9 [5.8,19.5]	28	19.3 [12.9,27.8]	15	16 [9.8,24.9]	35	18.1 [11.9,26.7]	21	16.7 [10.3,25.9]	35	21.2 [14.5,29.9]	p=0.668
Don't know	22	15 [9.7,22.3]	15	10.3 [5.9,17.4]	11	11.7 [6.3,20.8]	17	8.8 [4.9,15.4]	17	13.5 [9.2,19.4]	15	9.1 [4.5,17.4]	
HIV ELISA positive infants <18 months should start nevirapine until their PCR test results confirm that they are negative													
Yes	98	66.7 [57.6,74.7]	72	50.7 [43.2,58.2]	49	52.1 [40.7,63.3]	115	59.6 [50.5,68.1]	78	62.4 [53.9,70.2]	84	50.6 [42.1,59.0]	
No	**35**	**23.8 [16.8,32.6]**	**46**	**32.4 [24.6,41.3]**	**31**	**33 [23.1,44.6]**	**58**	**30.1 [23.1,38.0]**	**31**	**24.8 [17.4,34.0]**	**57**	**34.3 [27.8,41.5]**	p=0.272
Don't know	14	9.5 [5.3,16.4]	24	16.9 [10.6,25.9]	14	14.9 [7.3,28.0]	20	10.4 [6.8,15.4]	16	12.8 [8.2,19.4]	25	15.1 [9.7,22.7]	

EC = Eastern Cape; GP = Gauteng; KZN –KwaZulu Natal; LP=Limpopo; MP=Mpumalanga; NW = North West. n=total number

APPENDIX 10: MOTHERS' EXPERIENCES BY DISTRICT

This is an extension of the results presented in section 3.2

3.2.4 Mothers' experiences of MCH care in the context of PMTCT Option B+ by district

The following section describes the users' experiences of maternal and child health care in the context of PMTCT Option B+ by district.

3.2.4.1 NORTH WEST: BOJANALA PLATINUM DISTRICT MUNICIPALITY

3.2.4.1.1 Planned pregnancy

The majority of women had unplanned pregnancies across all strata except in the HIV negative 6-12-month postpartum group where 56.4 % had planned pregnancies versus 43.6% unplanned pregnancies (Figure 5).

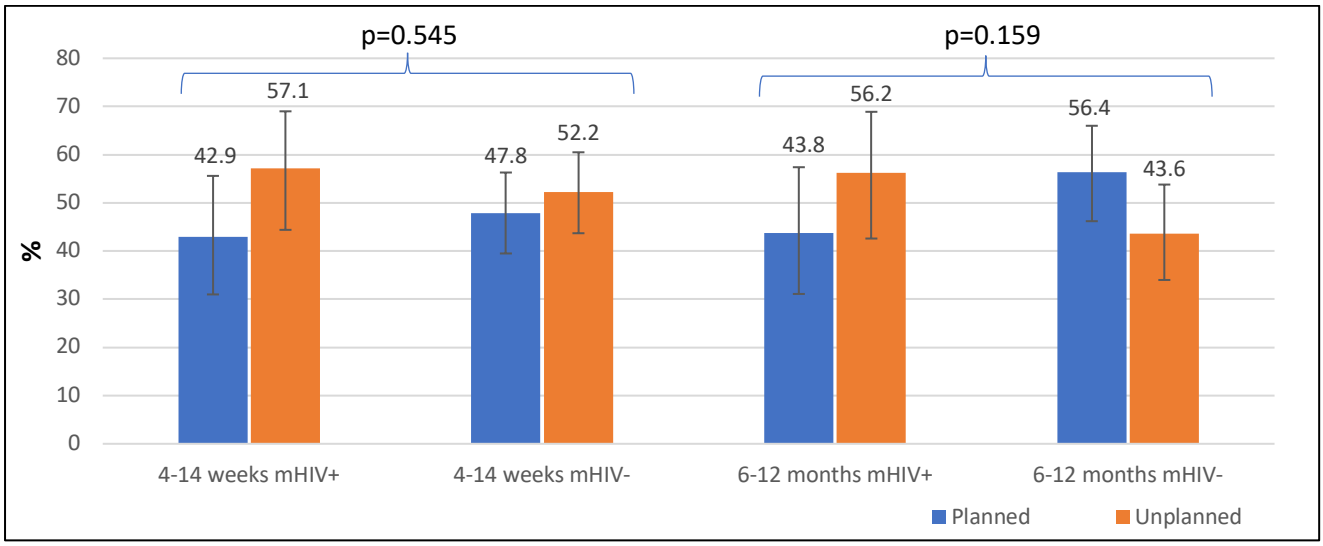


Figure 4: Planned pregnancy in Bojanala - – findings from PMTCT Option B+ Evaluation in South Africa 2018

EC = Eastern Cape; GP = Gauteng; KZN –KwaZulu Natal; LP=Limpopo; MP=Mpumalanga; NW = North West. N=total number; mHIV+ = mother HIV positive; mHIV- = mother HIV negative

3.2.4.1.2 Coverage of HIV testing among mothers and infants

Table 22 highlights the coverage of repeat HIV testing among HIV negative mothers in Bojanala. Pre-pregnancy HIV testing and subsequent receipt of the HIV test result was high amongst HIV negative mothers in the 4-14-week postpartum group (77.8% and 94.3%, respectively) and the 6-12-month postpartum group (80.0% and 95.5%, respectively). Although maternal knowledge of 3-monthly HIV testing amongst HIV negative mothers was

>80%, only 56.0% in the 4-14-week postpartum group and 60.9% in the 6-12-month postpartum group reported being tested every 3 months.

Table 22: Coverage of repeat HIV testing among HIV-negative mothers in Bojanala - – findings from PMTCT Option B+ Evaluation in South Africa 2018

Characteristic	Categories	4-14 weeks mHIV-		6-12 months mHIV-	
			% (95%CI)		% (95%CI)
		(n=90)		(n=110)	
Tested for HIV infection **PRIOR** to the latest pregnancy	Yes	70	77.8 [70.8,83.5]	88	80.0 [70.9,86.8]
	No	20	22.2 [16.5,29.2]	22	20.0 [13.2,29.1]
		(n=70)		(n=88)	
Received the result of the test done **prior** to the latest pregnancy	Yes	66	94.3 [83.5,98.2]	84	95.5 [86.0,98.6]
	No	4	5.7 [1.8,16.5]	4	4.5 [1.4,14.0]
		(n=91)		(n=108)	
Tested for HIV after delivery?	Yes	73	80.2 [68.1,88.5]	89	82.4 [74.8,88.1]
	No	18	19.8 [11.5,31.9]	19	17.6 [11.9,25.2]
		(n=92)		(n=109)	
Maternal knowledge of 3-monthly HIV testing	Yes	81	88.0 [78.8,93.6]	95	87.2 [78.0,92.8]
	No	4	4.3 [1.4,13.1]	2	1.8 [0.3,11.7]
	Don't know	7	7.6 [3.6,15.2]	12	11.0 [6.4,18.4]
		(n=91)		(n=110)	
Tested for HIV every 3 months (since 2015	Yes	51	56.0 [44.7,66.8]	67	60.9 [49.7,71.1]
	No	40	44.0 [33.2,55.3]	43	39.1 [28.9,50.3]
		(n=80)		(n=84)	
Still breastfeeding	Yes	45	56.3 [44.6,67.2]	49	58.3 [46.7,69.1]
	No	35	43.8 [32.8,55.4]	35	41.7 [30.9,53.3]

EC = Eastern Cape; GP = Gauteng; KZN –KwaZulu Natal; LP=Limpopo; MP=Mpumalanga; NW = North West. N=total number; mHIV+ = mother HIV positive; mHIV- = mother HIV negative

3.2.4.1.3 Maternal ART uptake and experience with HAART

Table 23 shows the uptake of ART among mothers who self-reported as HIV positive. Most mothers were knowledgeable about Option B+: >90% of mothers in the 4-14 week and >80% in the 6-12-month postpartum groups knew that mothers who tested HIV positive are started on ART immediately and >85% knew that ART is continued throughout breastfeeding. There was discordance between maternal self-report of ART treatment and recording of maternal ART in the RtHB: 98.4% of mothers in the 4-14 weeks postpartum group and 97.3% in the 6-12month postpartum group reported that they were on ART but only 65.5% and 63.1% had this recorded in the RtHB, respectively. Most mothers reported that they had initiated ART before pregnancy; however, only 75.0% in the 4-14 weeks postpartum group and 98.6% in the 6-12 month postpartum group reported initiating treatment immediately after HIV diagnosis without waiting for blood test results.

Table 23: Maternal ART uptake and experience amongst self-reported HIV positive mothers, ART initiated immediately following HIV diagnosis without waiting for blood test results in Bojanala - – findings from PMTCT Option B+ Evaluation in South Africa 2018

Characteristic	Categories	4-14 weeks mHIV+		6-12 months mHIV+	
			% (95%CI)		% (95%CI)
		(n=63)		(n=74)	
Maternal knowledge that mothers who tested HIV positive are started on ART immediately	Yes	61	96.8 [87.8,99.2]	63	85.1 [76.0,91.2]
	No	2	3.2 [0.8,12.2]	8	10.8 [5.8,19.3]
	Don't know	0	0	3	4.1 [1.5,10.8]
		(n=63)		(n=74)	
Maternal knowledge that all HIV positive mothers get ART throughout breastfeeding	Yes	54	85.7 [70.3,93.8]	66	89.2 [80.7,94.2]
	No	6	9.5 [3.2,25.4]	5	6.8 [2.6,16.6]
	Don't know	3	4.8 [1.6,13.2]	3	4.1 [1.5,10.8]
		(n=58)		(n=65)	
Mother on lifelong ART (as recorded on the RtHB)	Yes	38	65.5 [47.3,80.1]	41	63.1 [50.6,74.0]
	No	0	0	0	0
	Don't know	20	34.5 [19.9,52.7]	24	36.9 [26.0,49.4]
		(n=63)		(n=74)	
Mother on HAART	Yes	62	98.4 [89.9,99.8]	72	97.3 [89.7,99.3]
	No	1	1.6 [0.2,10.1]	2	2.7 [0.7,10.3]
		(n=58)		(n=69)	
Timing of ART initiation	Before pregnancy	36	62.1 [47.7,74.6]	44	63.8 [51.8,74.3]
	During pregnancy	20	34.5 [21.6,50.1]	24	34.8 [24.6,46.6]
	After delivery	2	3.4 [0.9,11.9]	1	1.4 [0.2,9.6]
		(n=60)		(n=70)	
ARVs initiated immediately after diagnosis without waiting for blood test results	Yes	45	75.0 [63.3,83.9]	48	68.6 [57.2,78.1]
	No	15	25.0 [16.1,36.7]	21	30.0 [20.4,41.7]
	Don't know	0	0	1	1.4 [0.2,9.5]

EC = Eastern Cape; GP = Gauteng; KZN –KwaZulu Natal; LP=Limpopo; MP=Mpumalanga; NW = North West.
N=total number; mHIV+ = mother HIV positive; mHIV- = mother HIV negative

3.2.4.1.4 Coverage of viral load testing

Table 24 highlights the coverage of viral load testing. The majority of mothers reported that they had been tested for viral load since they initiated ART (88.9% in the in the 4-14 week and 91.9% in the 6-12 month postpartum age groups) but only half reported they had their viral load result explained to them.

Table 24: Coverage of viral load testing in Bojanala - – findings from PMTCT Option B+ Evaluation in South Africa 2018

Characteristic	Categories	4-14 weeks mHIV+		6-12 months mHIV+	
			% (95%CI)		% (95%CI)
Mother had a viral load test since ART initiation			(n=63)		(n=74)
	Yes	56	88.9 [77.6,94.9]	68	91.9 [84.0,96.1]
	No	6	9.5 [4.0,21.1]	6	8.1 [3.9,16.0]
	Chooses not to answer/missing	1	1.6 [0.2,11.7]	0	0
Of those reporting to have had a viral load test:		**N=56**		**N=68**	
Viral load test result explained to mother	Yes	47	83.9 [70.5,91.9]	50	73.5 [62.2,82.4]
	No	8	14.3 [6.8,27.7]	17	25.0 [15.5,37.7]
	Chooses not to answer/missing	1	1.8 [0.2,13.4]	1	1.5 [0.2,10.0]

EC = Eastern Cape; GP = Gauteng; KZN –KwaZulu Natal; LP=Limpopo; MP=Mpumalanga; NW = North West.
N=total number; mHIV+ = mother HIV positive; mHIV- = mother HIV negative

3.2.4.1.5 Infant HIV testing coverage

Table 25 shows coverage of infant HIV testing and infant HIV results as documented on the RtHB. Amongst infants aged 4-14 weeks, birth HIV testing was recorded for only 56.9% of infants with a 9.4% positivity. Over a third (36.2%) of RtHBs did not have infant birth HIV testing recorded. HIV testing was done documented in the RtHB for 34.5% of infants at 6 weeks and 17.5% of infants at 10 weeks; however, 50.0% and 49.1% of infants did not have a record of HIV testing documented at these timepoints, respectively.

Among infants aged 6-12 months, birth HIV testing was recorded for 60.0% of infants with all infants having an HIV negative result. Thirty-five (35.4%) of infant's RtHBs did not have birth HIV testing recorded. HIV testing was done for 46.2% of infants at 6 weeks and 12.3% of infants at 16 weeks; however, 47.7% and 80.0%, of infants, respectively did not have a record of HIV testing documented at these timepoints.

Table 25: Coverage of HIV testing and HIV results (as recorded in the infants RtHB) among infants aged 4-14 weeks and 6-12 months whose mothers self-reported HIV positive in Bojanala - – findings from PMTCT Option B+ Evaluation in South Africa 2018

Characteristic	Categories	4-14 weeks mHIV+		6-12 months mHIV+	
			% (95%CI)		% (95%CI)
		N=58		N=65	
Infant Birth HIV testing	Yes	33	56.9 [41.0,71.4]	39	60.0 [43.8,74.3]
	No	3	5.2 [1.8,14.1]	1	1.5 [0.2,10.1]
	Not recorded	21	36.2 [23.4,51.4]	23	35.4 [21.4,52.4]
	Not applicable	1	1.7 [0.2,11.6]	2	3.1 [0.8,11.6]
		N=32		N=39	
Birth result	Positive	3	9.4 [3.5,23.0]	0	0
	Negative	24	75.0 [57.0,87.2]	39	100
	Not recorded	5	15.6 [5.9,35.4]	0	0
		N=58		N=65	
HIV testing at 6 weeks	Yes	20	34.5 [20.9,51.2]	30	46.2 [30.6,62.5]
	No	2	3.4 [0.9,12.8]	3	4.6 [1.0,18.2]
	Not recorded	29	50.0 [34.5,65.5]	31	47.7 [32.2,63.6]
	Not applicable	7	12.1 [6.4,21.7]	1	1.5 [0.2,10.1]
		N=20		N=30	
6-week result	Positive	4	20.0 [7.4,43.8]	0	0
	Negative	16	80.0 [56.2,92.6]	28	93.3 [75.8,98.4]
	Not recorded	0	0	2	6.7 [1.6,24.2]
		N=57		N=65	
HIV testing at 10 weeks	Yes	10	17.5 [10.8,27.2]	29	44.6 [32.3,57.6]
	No	3	5.3 [1.2,20.1]	1	1.5 [0.2,10.1]
	Not recorded	28	49.1 [35.0,63.4]	33	50.8 [37.8,63.7]
	Not applicable	16	28.1 [19.0,39.4]	2	3.1 [0.8,11.6]
		N=64		N=29	
10-week result	Positive	2	20.0 [5.6,51.5]	0	0
	Negative	60	60.0 [24.5,87.4]	26	89.7 [71.9,96.7]
	Not recorded	2	20.0 [5.6,51.5]	3	10.3 [3.3,28.1]
				N=65	
HIV testing at 16-18 weeks	Yes			8	12.3 [4.5,29.7]
	No			1	1.5 [0.2,10.1]
	Not recorded			52	80.0 [65.8,89.2]
	Not applicable			4	6.2 [2.3,15.5]
				N=8	
16-18-week result	Positive			0	0
	Negative			8	100
	Not recorded			0	0

EC = Eastern Cape; GP = Gauteng; KZN –KwaZulu Natal; LP=Limpopo; MP=Mpumalanga; NW = North West. N=total number; mHIV+ = mother HIV positive; mHIV- = mother HIV negative

3.2.4.1.6 Infant feeding

Figures 6a and 6b illustrate infant feeding practices at two-time points: 1) birth (as recorded on the RtHB) and 2) at the interview (based on 8-day maternal recall). The majority of HIV positive and HIV negative mothers in both the 4-14 week and 6-12 months postpartum age groups opted for exclusive breastfeeding at birth (as recorded on the RtHB). At the time of the interview, the infant feeding practices changed as the majority of mothers reported that they were doing mixed feeding and only 49.2% HIV positive and 32.6% HIV negative mothers whose infants were between 4-14 weeks reported that they were exclusively breastfeeding

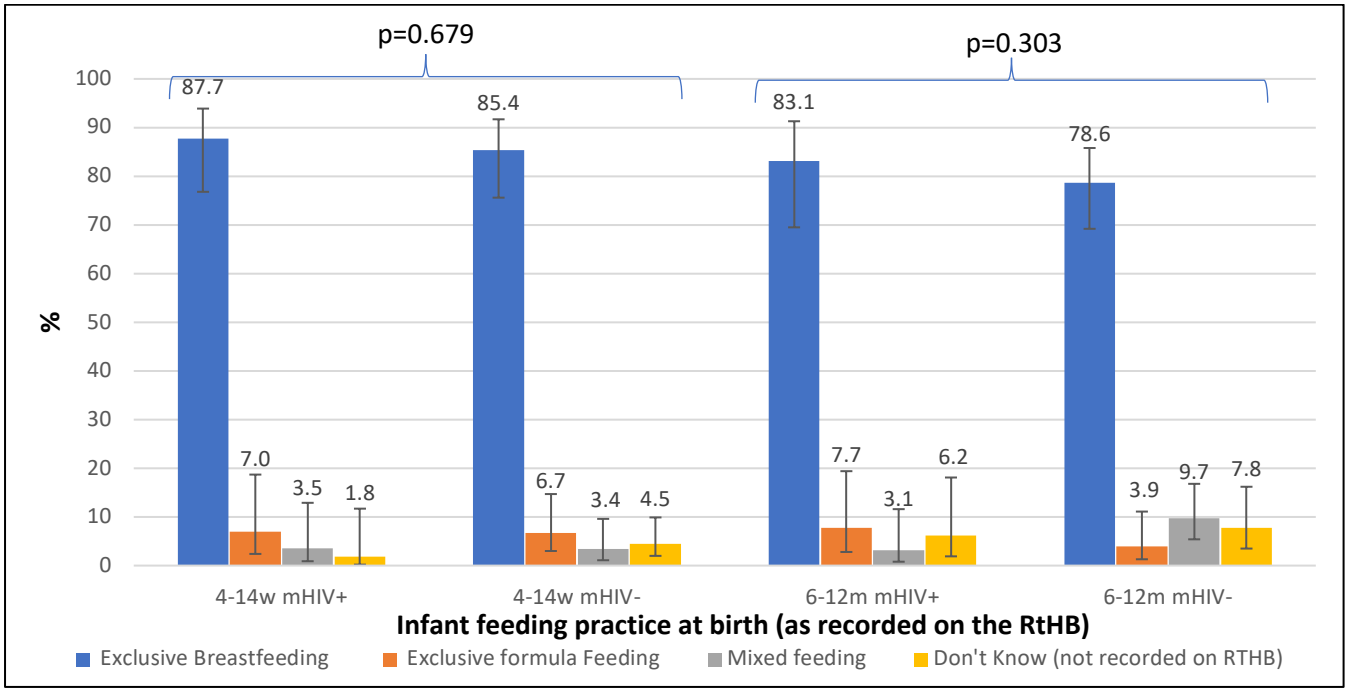


Figure 5a: Infant feeding practice at birth as recorded on the infants RtHB in Bojanala - – findings from PMTCT Option B+ Evaluation in South Africa 2018

EC = Eastern Cape; GP = Gauteng; KZN –KwaZulu Natal; LP=Limpopo; MP=Mpumalanga; NW = North West. N=total number; mHIV+ = mother HIV positive; mHIV- = mother HIV negative RtHB = Road to Health Booklet

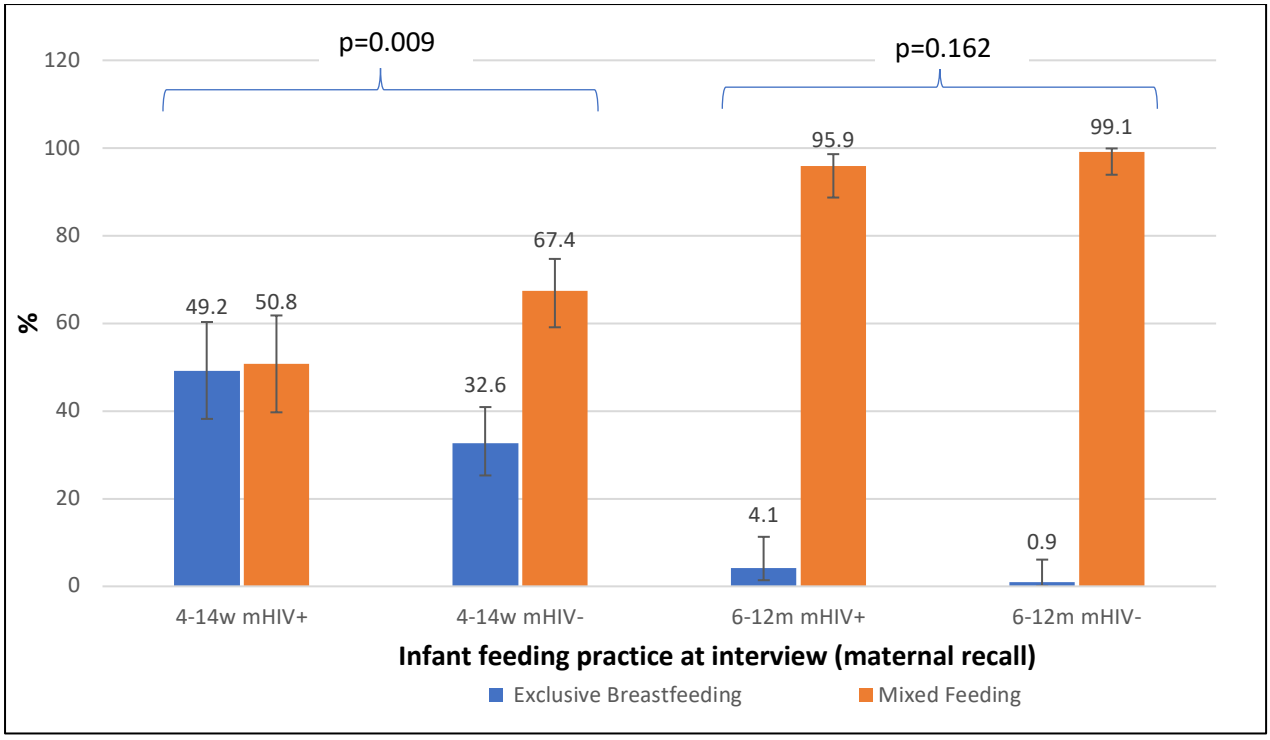


Figure 6b: **Infant feeding practices assessed at interview based on 8-day maternal recall in Bojanala** - – findings from PMTCT Option B+ Evaluation in South Africa 2018

EC = Eastern Cape; GP = Gauteng; KZN –KwaZulu Natal; LP=Limpopo; MP=Mpumalanga; NW = North West. N=total number; mHIV+ = mother HIV positive; mHIV- = mother HIV negative

3.2.4.2 MPUMALANGA: EHLANZENI DISTRICT MUNICIPALITY

3.2.4.2.1 Planned Pregnancy

The majority of mothers in in all strata reported that their pregnancy was planned (Figure 7). The highest percentage of unplanned pregnancy was reported by HIV negative mothers in the 4-14 weeks postpartum group (43.8%). There were no statistically significant differences in pregnancy planning by HIV status.

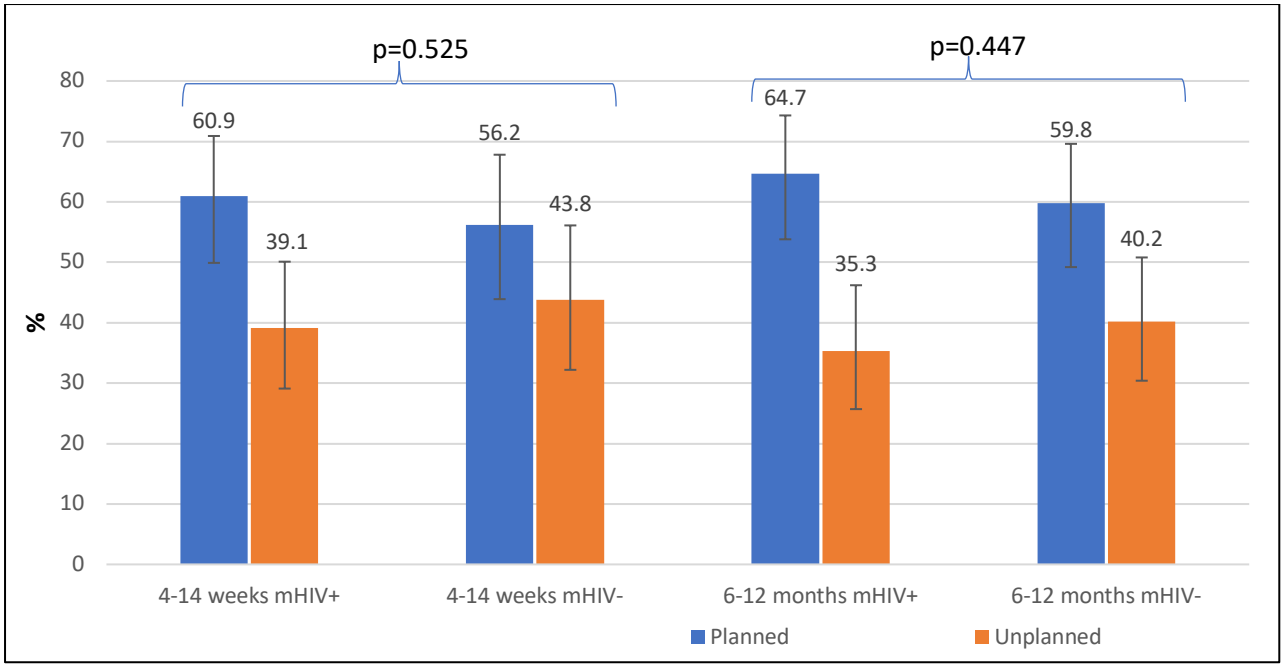


Figure 6: Planned pregnancy in Ehlanzeni - – findings from PMTCT Option B+ Evaluation in South Africa 2018

EC = Eastern Cape; GP = Gauteng; KZN –KwaZulu Natal; LP=Limpopo; MP=Mpumalanga; NW = North West. N=total number; mHIV+ = mother HIV positive; mHIV- = mother HIV negative

3.2.4.2.2 Coverage of HIV testing among mothers

Table 26 highlights the coverage of 3 monthly repeat HIV testing among HIV negative mothers. Pre-pregnancy HIV testing and subsequent receipt of the HIV test result was high amongst HIV negative mothers in the 4-14-week postpartum group (91.0% and 100%, respectively) and the 6-12-month postpartum group (80.4% and 100%, respectively). Although maternal knowledge of 3-monthly HIV testing amongst HIV negative mothers was >90%, only 66.3% in the 4-14-week postpartum group and 62.2% in the 6-12-month postpartum group reported being tested every 3 months.

Table 26: Coverage of repeat HIV testing among HIV-negative mothers in Ehlanzeni - – findings from PMTCT Option B+ Evaluation in South Africa 2018

Characteristic	Categories	4-14 weeks mHIV-		6-12 months mHIV-	
			% (95%CI)		% (95%CI)
		N=89		N=112	
Tested for HIV infection PRIOR to the latest pregnancy	Yes	81	91.0 [81.6,95.8]	90	80.4 [71.2,87.1]
	No	8	9.0 [4.2,18.4]	22	19.6 [12.9,28.8]
		N=81		N=90	
Received the result of the test done prior to the latest pregnancy	Yes	81	100	90	100
	No	0	0	0	0
		N=88		N=111	
Tested for HIV after delivery?	Yes	73	83 [75.1,88.7]	101	91.0 [79.9,96.3]
	No	15	17.0 [11.3,24.9]	10	9.0 [3.7,20.1]
		N=89		N=112	
Maternal knowledge of 3-monthly HIV testing	Yes	84	94.4 [85.8,97.9]	106	94.6 [89.4,97.4]
	No	3	3.4 [1.1,10.1]	4	3.6 [1.4,8.8]
	Don't know	2	2.2 [0.6,7.7]	2	1.8 [0.5,6.5]
		N=89		N=111	
Tested for HIV every 3 months (since 2015)	Yes	59	66.3 [57.0,74.5]	69	62.2 [50.9,72.2]
	No	30	33.7 [25.5,43.0]	42	37.8 [27.8,49.1]
		N=75		N=82	
Still breastfeeding	Yes	49	65.3 [54.3,74.9]	51	62.2 [49.4,73.5]
	No	26	34.7 [25.1,45.7]	31	37.8 [26.5,50.6]

EC = Eastern Cape; GP = Gauteng; KZN –KwaZulu Natal; LP=Limpopo; MP=Mpumalanga; NW = North West. N=total number; mHIV+ = mother HIV positive; mHIV- = mother HIV negative

3.2.4.2.3 Maternal ART uptake

Table 27 shows the uptake of ART among mothers who self-reported as HIV positive. Most mothers were knowledgeable about Option B+ i.e. >90% of mothers in the 4-14 week and 6-12-month postpartum groups knew that mothers who tested HIV positive are started on ART immediately and >90% knew that ART is continued throughout breastfeeding. Most mothers reported that they had initiated ART before pregnancy; however, only 76.1% in the 4-14 weeks postpartum group and 72.3% in the 6-12 months postpartum group reported initiating treatment immediately after HIV diagnosis without waiting for blood test results.

Table 27: Maternal ART uptake and experience amongst self-reported HIV positive mothers, ART initiated immediately following HIV diagnosis without waiting for blood test results in Ehlanzeni - – findings from PMTCT Option B+ Evaluation in South Africa 2018

Characteristic	Categories	4-14 weeks mHIV+		6-12 months mHIV+	
			% (95%CI)		% (95%CI)
		(N=69)		(N=85)	
Maternal knowledge that mothers who tested HIV positive are started on ART immediately	Yes	67	97.1 [90.2,99.2]	81	95.3 [85.9,98.5]
	No	2	2.9 [0.8,9.8]	4	4.7 [1.5,14.1]
	Don't know	0	0	0	0
		(N=69)		(N=85)	
Maternal knowledge that all HIV positive mothers get ART throughout breastfeeding	Yes	66	95.7 [87.0,98.6]	80	94.1 [86.4,97.6]
	No	1	1.4 [0.2,10.2]	1	1.2 [0.2,7.3]
	Don't know	2	2.9 [0.7,10.9]	4	4.7 [2.1,10.3]
		(N=66)		(N=79)	
Mother on lifelong ART (as recorded on the RtHB)	Yes	64	97.0 [88.9,99.2]	73	92.4 [81.0,97.2]
	No	0	0	0	0
	Don't know	2	3.0 [0.8,11.1]	6	7.6 [2.8,19.0]
		(N=69)		(N=85)	
Mother on HAART	Yes	69	100	85	100
	No	0	0	0	0
		(N=68)		(N=84)	
Timing of ART initiation	Before pregnancy	40	58.8 [51.4,65.9]	51	60.7 [52.3,68.5]
	During pregnancy	27	39.7 [32.3,47.6]	32	38.1 [30.2,46.7]
	After delivery	1	1.5 [0.2,8.8]	1	1.2 [0.2,7.4]
		(N=67)		(N=83)	
ARVs initiated immediately after diagnosis without waiting for blood test results	Yes	51	76.1 [67.5,83.0]	60	72.3 [63.4,79.7]
	No	15	22.4 [15.7,30.8]	22	26.5 [19.4,35.1]
	Don't know	1	1.5 [0.2,10.5]	1	1.2 [0.2,7.4]

EC = Eastern Cape; GP = Gauteng; KZN –KwaZulu Natal; LP=Limpopo; MP=Mpumalanga; NW = North West.

N=total number; mHIV+ = mother HIV positive; mHIV- = mother HIV negative

3.2.4.2.4 Coverage of viral load testing in Ehlanzeni

Table 28 highlights the coverage of viral load testing. The majority of mothers reported that they had been tested for viral load since they initiated ART (88.4% in the in the 4-14 week and 90.6% in the 6-12 months postpartum age group).

Table 28: Coverage of viral load testing in Ehlanzeni - – findings from PMTCT Option B+ Evaluation in South Africa 2018

Characteristic	Categories	4-14 weeks mHIV+		6-12 months mHIV+	
			% (95%CI)		% (95%CI)
Mother had a viral load test since ART initiation		(n=69)		(n=85)	
	Yes	61	88.4 [72.8,95.6]	77	90.6 [81.7,95.4]
	No	8	11.6 [4.4,27.2]	8	9.4 [4.6,18.3]
	Chooses not to answer/missing	0	0	0	0
Of those reporting to have had a viral load test:		n=61		n=77	
Viral load test result explained to mother	Yes	48	78.7 [65.1,88.0]	64	83.1 [70.8,90.9]
	No	10	16.4 [9.5,26.8]	7	9.1 [5.0,16.0]
	Chooses not to answer/missing	3	4.9 [1.9,12.2]	6	7.8 [2.9,19.1]

EC = Eastern Cape; GP = Gauteng; KZN –KwaZulu Natal; LP=Limpopo; MP=Mpumalanga; NW = North West.
N=total number; mHIV+ = mother HIV positive; mHIV- = mother HIV negative

3.2.4.2.5 Coverage of infant HIV testing and infant results (as recorded in the infants RtHB)

The table below shows coverage of infant HIV testing and infant HIV results as documented on the RTHB (Table 29). Amongst infants aged 4-14 weeks, birth HIV testing was recorded for 77.3% of infants with a 2.0% positivity. HIV testing was done for 30.3% of infants at 6 weeks and 24.2% of infants at 10 weeks however 40.9% and 37.9% of infants did not have a record of HIV testing documented at these timepoints respectively.

Among infants aged 6-12 months, birth HIV testing was recorded for 81.3% of infants with a 1.5% positivity. Less than 20% of RtHBs did not have infant birth HIV testing recorded. HIV testing was done for 66.3% of infants at 6 weeks and 13.8% of infants at 16 weeks; however, 15% and 62.5% of infants, respectively did not have a record of HIV testing documented at these timepoints respectively.

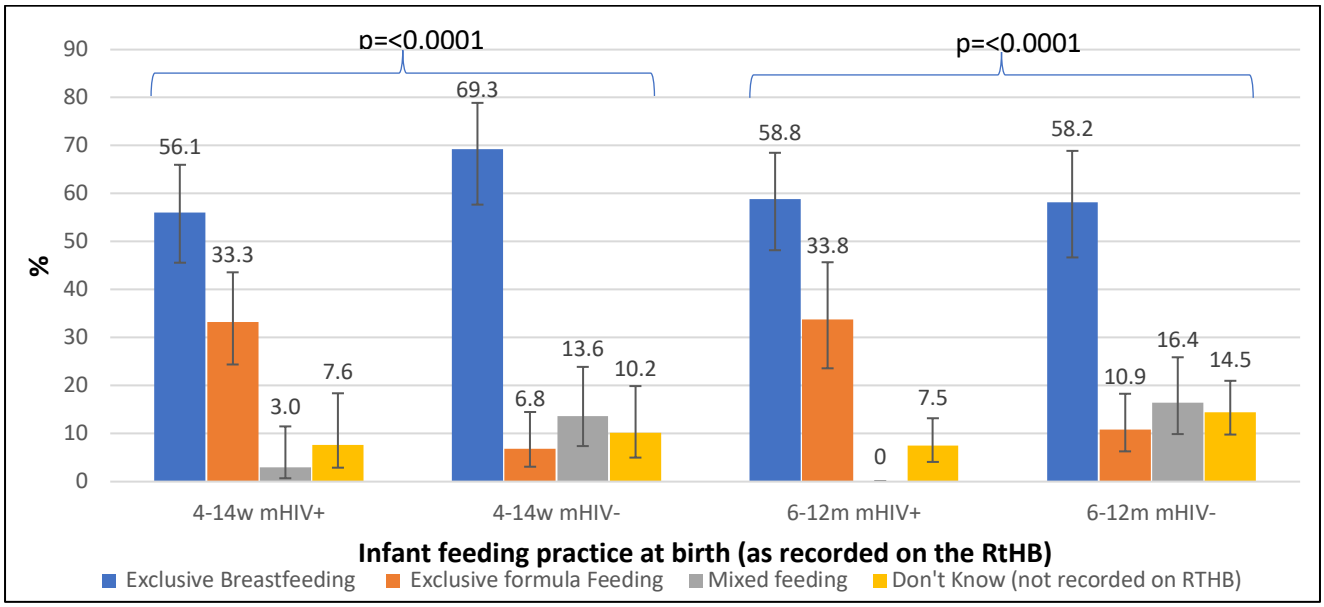
Table 29: Coverage of HIV testing and HIV results (as recorded in the infants RtHB) among infants aged 4-14 weeks and 6-12 months whose mother self-reported HIV positive in Ehlanzeni – findings from PMTCT Option B+ Evaluation in South Africa 2018

Characteristic	Categories	4-14 weeks mHIV+		6-12 months mHIV+	
			% (95%CI)		% (95%CI)
		N=66		N=80	
Infant Birth HIV testing	Yes	51	77.3 [65.1,86.1]	65	81.3 [68.7,89.5]
	No	3	4.5 [1.7,11.8]	1	1.3 [0.2,8.5]
	Not recorded	12	18.2 [9.9,31.0]	12	15 [7.9,26.7]
	Not applicable	0	0	2	2.5 [0.4,14.7]
		N=51		N=65	
Birth result	Positive	1	2.0 [0.3,12.5]	1	1.5 [0.2,9.3]
	Negative	34	66.7 [46.2,82.3]	61	93.8 [86.0,97.4]
	Not recorded	16	31.4 [16.9,50.7]	3	4.6 [1.6,12.9]
		N=66		N=80	
HIV testing at 6 weeks	Yes	20	30.3 [17.6,46.9]	53	66.3 [54.0,76.7]
	No	12	18.2 [11.8,27.0]	6	7.5 [3.4,15.7]
	Not recorded	27	40.9 [27.7,55.6]	19	23.7 [14.4,36.5]
	Not applicable	7	10.6 [4.8,21.8]	2	2.5 [0.7,8.2]
		N=20		N=53	
6-week result	Positive	0	0	0	0
	Negative	14	70.0 [45.4,86.7]	51	96.2 [86.5,99.0]
	Not recorded	6	30.0 [13.3,54.6]	2	3.8 [1.0,13.5]
		N=66		N=60	
HIV testing at 10 weeks	Yes	16	24.2 [16.6,34.0]	34	42.5 [32.3,53.4]
	No	4	6.1 [2.5,13.8]	10	12.5 [6.4,23.0]
	Not recorded	25	37.9 [26.2,51.2]	33	41.3 [28.9,54.8]
	Not applicable	21	31.8 [18.8,48.5]	3	3.8 [1.4,9.8]
		N=16		N=34	
10-week result	Positive	0	0	1	2.9 [0.5,16.5]
	Negative	9	56.3 [33.4,76.7]	32	94.1 [80.9,98.4]
	Not recorded	7	43.8 [23.3,66.6]	1	2.9 [0.4,18.3]
				N=80	
HIV testing at 16-18 weeks	Yes			11	13.8 [7.8,23.0]
	No			12	15.0 [9.3,23.3]
	Not recorded			50	62.5 [49.8,73.7]
	Not applicable			7	8.8 [4.6,16.1]
				N=11	
16-18-week result	Positive			0	0
	Negative			9	81.8 [51.7,95.0]
	Not recorded			2	18.2 [5.0,48.3]

EC = Eastern Cape; GP = Gauteng; KZN –KwaZulu Natal; LP=Limpopo; MP=Mpumalanga; NW = North West.
N=total number; mHIV+ = mother HIV positive; mHIV- = mother HIV negative

3.2.4.2.6 Infant feeding

Figures 8a and 8b illustrate infant feeding practices at two-time points: 1) birth (as recorded on the RtHB) and 2) at the interview (based on 8-day maternal recall). The majority of HIV positive and HIV negative mothers in both the 4-14 week and 6-12 months postpartum age groups opted for exclusive breastfeeding at birth (as recorded on the RtHB). In the 4-14-week postpartum group, a significantly higher number of HIV negative mothers (69.3%) compared to HIV positive mothers (56.1%) chose to exclusively breastfeed at birth, p<0.0001.



EC = Eastern Cape; GP = Gauteng; KZN –KwaZulu Natal; LP=Limpopo; MP=Mpumalanga; NW = North West. N=total number; mHIV+ = mother HIV positive; mHIV- = mother HIV negative

Figure 7a: Infant feeding practice at birth as recorded on the infants RtHB in Ehlanzeni - – findings from PMTCT Option B+ Evaluation in South Africa 2018

At the time of the interview, the majority of mothers reported that they were using mixed feeding and only 40.6% HIV positive and 38.2% HIV negative mothers whose infants were between 4-14 weeks reported that they were exclusively breastfeeding. Also, 9.4% HIV positive and 6.3% HIV negative mothers whose infants were aged 6-12 months reported that they were exclusively breastfeeding.

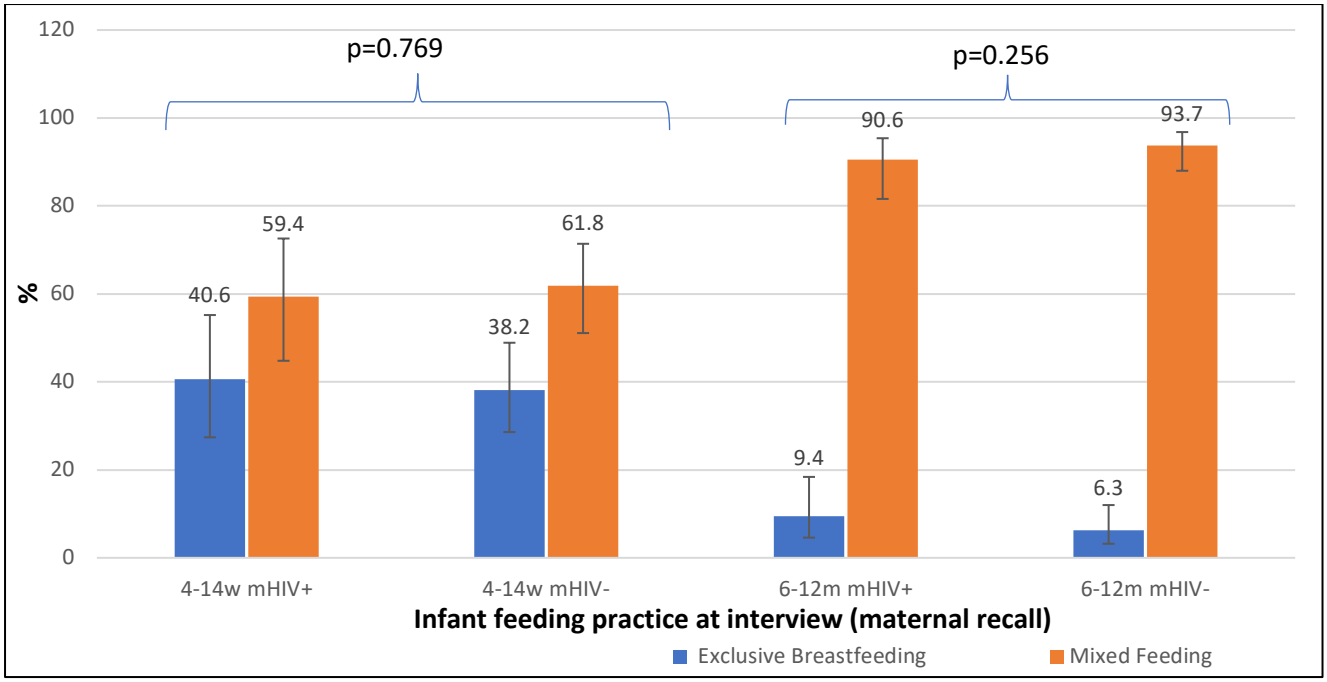


Figure 8b: Infant feeding practice reported at interview based on 8-day maternal recall in Ehlanzeni –
– findings from PMTCT Option B+ Evaluation in South Africa 2018
EC = Eastern Cape; GP = Gauteng; KZN –KwaZulu Natal; LP=Limpopo; MP=Mpumalanga; NW = North West. N=total number; mHIV+ = mother HIV positive; mHIV- = mother HIV negative

3.2.4.3 GAUTENG: EKURHULENI METROPOLITAN MUNICIPALITY

3.2.4.3.1 Planned pregnancy

The majority (59.7%) of mothers in the HIV positive 4-14 weeks postpartum group reported that their pregnancy was unplanned (Figure 9).

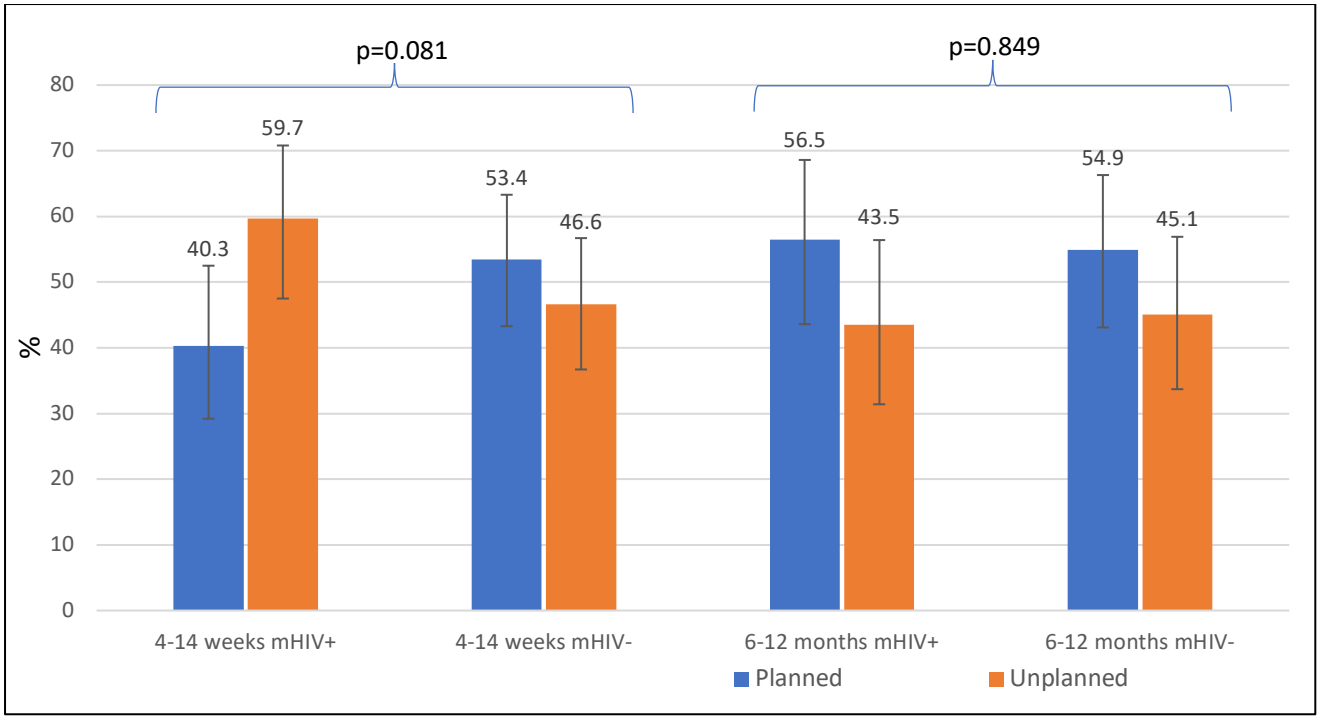


Figure 8: Planned pregnancy in Ekurhuleni - – findings from PMTCT Option B+ Evaluation in South Africa 2018

EC = Eastern Cape; GP = Gauteng; KZN –KwaZulu Natal; LP=Limpopo; MP=Mpumalanga; NW = North West. N=total number; mHIV+ = mother HIV positive; mHIV- = mother HIV negative

3.2.4.3.2 Coverage of HIV testing among HIV-negative mothers

Table 30 highlights the coverage of repeat HIV testing among HIV negative mothers. Pre-pregnancy HIV testing and subsequent receipt of the HIV test result was high amongst HIV negative mothers in the 4-14-week postpartum group (84.9% and 98.4% respectively) and the 6-12-month postpartum group (83.5% and 100% respectively). Although maternal knowledge of 3-monthly HIV testing amongst HIV negative mothers was >80%, only 50.0% in the 4-14-week postpartum group and 47.8% in the 6-12-month postpartum group reported being tested every 3 months.

Table 30: Coverage of repeat HIV testing among HIV-negative mothers in Ekurhuleni - – findings from PMTCT Option B+ Evaluation in South Africa 2018

Characteristic	Categories	4-14 weeks mHIV-		6-12 months mHIV-	
			% (95%CI)		% (95%CI)
		N=73		N=91	
Tested for HIV infection prior to the latest pregnancy	Yes	62	84.9 [75.6,91.1]	76	83.5 [69.2,92.0]
	No	11	15.1 [8.9,24.4]	15	16.5 [8.0,30.8]
		N=62		N=76	
Received the result of the test done prior to the latest pregnancy	Yes	61	98.4 [89.7,99.8]	76	100
	No	1	1.6 [0.2,10.3]	0	0
		N=70		N=90	
Tested for HIV after delivery	Yes	52	74.3 [61.6,83.9]	70	77.8 [65.1,86.8]
	No	18	25.7 [16.1,38.4]	20	22.2 [13.2,34.9]
		N=73		N=91	
Maternal knowledge of 3-monthly HIV testing	Yes	62	84.9 [75.0,91.4]	81	89.0 [78.3,94.8]
	No	2	2.7 [0.7,10.3]	5	5.5 [2.5,11.6]
	Don't know	9	12.3 [6.9,21.0]	5	5.5 [1.8,15.9]
		N=72		N=90	
Tested for HIV every 3 months (since 2015)	Yes	36	50.0 [37.9,62.1]	43	47.8 [34.8,61.1]
	No	36	50.0 [37.9,62.1]	47	52.2 [38.9,65.2]
		N=59		58	
Still breastfeeding	Yes	29	49.2 [37.6,60.8]	30	51.7 [34.8,68.3]
	No	30	50.8 [39.2,62.4]	28	48.3 [31.7,65.2]

EC = Eastern Cape; GP = Gauteng; KZN –KwaZulu Natal; LP=Limpopo; MP=Mpumalanga; NW = North West.
N=total number; mHIV+ = mother HIV positive; mHIV- = mother HIV negative

3.2.4.3.3 Maternal ART uptake

Table 31 shows the uptake of ART among mothers who self-reported as HIV positive. Most mothers were knowledgeable about Option B+:>90% of mothers in the 4-14 week and 6-12-month postpartum groups knew that mothers who tested HIV positive are started on ART immediately and >85% knew that ART is continued throughout breastfeeding. There was discordance between maternal self-report of ART treatment and recording of maternal ART in the RtHB:98.4% of mothers in the 4-14 weeks postpartum group and 97.9% in the 6-12month postpartum group reported that they were on ART but only 82.5% and 77.5% had this recorded in the RtHB respectively. Most mothers reported that they had initiated ART before pregnancy; however, only 67.2% in the 4-14 weeks postpartum group and 62.2% in the 6-12 months postpartum group reported initiating treatment immediately after HIV diagnosis without waiting for blood test results.

Table 31: Maternal ART uptake amongst self-reported HIV positive mothers, ART initiated immediately following HIV diagnosis without waiting for blood test results in Ekurhuleni - – findings from PMTCT Option B+ Evaluation in South Africa 2018

Characteristic	Categories	4-14 weeks mHIV+		6-12 months mHIV+	
			% (95%CI)		% (95%CI)
		N=62		N=47	
Maternal knowledge that mothers who tested HIV positive are started on ART immediately	Yes	59	95.2 [86.1,98.4]	43	91.5 [79.2,96.8]
	No	1	1.6 [0.2,11.3]	1	2.1 [0.3,14.6]
	Don't know	2	3.2 [0.8,11.5]	3	6.4 [2.1,17.7]
		N=61		N=47	
Maternal knowledge that all HIV positive mothers get ART throughout breastfeeding	Yes	58	95.1 [87.4,98.2]	40	85.1 [71.4,92.9]
	No	3	4.9 [1.8,12.6]	7	14.9 [7.1,28.6]
	Don't know	0	0	0	0
		N=57		N=40	
Mother on lifelong ART (as recorded on the RtHB)	Yes	47	82.5 [72.6,89.3]	31	77.5 [61.8,88.0]
	No	1	1.8 [0.2,11.5]	2	5.0 [1.3,17.9]
	Don't know	9	15.8 [9.2,25.8]	7	17.5 [7.5,35.6]
		N=62		N=47	
Mother on HAART	Yes	61	98.4 [88.7,99.8]	46	97.9 [88.0,99.7]
	No	1	1.6 [0.2,11.3]	1	2.1 [0.3,12.0]
		N=61		N=46	
Timing of ART initiation	Before pregnancy	39	63.9 [50.3,75.7]	32	69.6 [54.7,81.2]
	During pregnancy	20	32.8 [22.8,44.6]	13	28.3 [16.5,44.0]
	After delivery	2	3.3 [0.9,11.7]	1	2.2 [0.3,13.7]
		N=61		N=45	
ARVs initiated immediately after HIV diagnosis without waiting for blood test results	Yes	41	67.2 [56.6,76.3]	28	62.2 [50.3,72.8]
	No	19	31.1 [22.6,41.2]	16	35.6 [24.7,48.1]
	Don't know	1	1.6 [0.2,10.9]	1	2.2 [0.3,14.6]

EC = Eastern Cape; GP = Gauteng; KZN –KwaZulu Natal; LP=Limpopo; MP=Mpumalanga; NW = North West.
N=total number; mHIV+ = mother HIV positive; mHIV- = mother HIV negative

3.2.4.3.4 Coverage of viral load testing

Table 32 highlights the coverage of viral load testing. The majority of mothers reported that they had been tested for viral load since they initiated ART (90.3% in the in the 4-14 week and 97.9% in the 6-12 months postpartum age group).

Table 32 Coverage of viral load testing in Ekurhuleni - – findings from PMTCT Option B+ Evaluation in South Africa 2018

Characteristic	Categories	4-14 weeks mHIV+		6-12 months mHIV+	
			% (95%CI)		% (95%CI)
Mother had a viral load test since ART initiation		(N=62)		(N=47)	
	Yes	56	90.3 [80.8,95.4]	46	97.9 [84.6,99.7]
	No	6	9.7 [4.6,19.2]	1	2.1 [0.3,15.4]
	Chooses not to answer/missing	0	0	0	0
Of those reporting to have had a viral load test:		N=56		N=46	
Viral load test result explained to mother	Yes	47	83.9 [69.7,92.2]	36	78.3 [58.0,90.4]
	No	9	16.1 [7.8,30.3]	7	15.2 [4.5,40.4]
	Chooses not to answer/missing	0	0	3	6.5 [2.1,18.5]

"No significant differences were observed between postnatal age-groups, all chi-squared p-values were>0.05."

EC = Eastern Cape; GP = Gauteng; KZN –KwaZulu Natal; LP=Limpopo; MP=Mpumalanga; NW = North West. N=total number; mHIV+ = mother HIV positive; mHIV- = mother HIV negative

3.2.4.3.5 Coverage of infant HIV testing and HIV results (as recorded in the infants RtHB)

Table 33 shows coverage of infant HIV testing and infant HIV results as documented on the RtHB. Amongst infants aged 4-14 weeks, birth HIV testing was recorded for 73.7% of infants with a 2.4% positivity. Almost a quarter (24.6%) of RtHBs did not have infant birth HIV testing recorded. HIV testing was done for 45.6% of infants at 6 weeks and 17.1% of infants at 10 weeks; however, 36.8% and 49.1% of infants did not have a record of HIV testing documented at these timepoints respectively.

Among infants aged 6-12 months, birth HIV testing was recorded for 72.5% of infants with a 6.7% positivity. Twenty percent (20%) of RtHBs did not have infant birth HIV testing recorded. HIV testing was done for 65.0% of infants at 6 weeks and 28.2% of infants at 16 weeks; however, 27.5% and 51.3% of infants, respectively did not have a record of HIV testing documented at these timepoints.

Table 33: Coverage of HIV testing and HIV results (as recorded in the infants RtHB) among infants aged 4-14 weeks and 6-12 months whose mother self-reported HIV positive in Ekurhuleni - – findings from PMTCT Option B+ Evaluation in South Africa 2018

Characteristic	Categories	4-14 weeks mHIV+		6-12 months mHIV+	
			% (95%CI)		% (95%CI)
		N=57		N=40	
Infant Birth HIV testing	Yes	42	73.7 [62.3,82.6]	29	72.5 [55.2,85.0]
	No	1	1.8 [0.2,11.9]	3	7.5 [2.5,20.4]
	Not recorded	14	24.6 [15.9,35.9]	8	20.0 [9.4,37.6]
	Not applicable	0	0	0	0
			N=42		N=30
Birth result	Positive	1	2.4 [0.4,14.3]	2	6.7 [2.2,18.6]
	Negative	41	97.6 [85.7,99.6]	28	93.3 [81.4,97.8]
	Not recorded	0	0	0	0
			N=57		N=40
HIV testing at 6 weeks	Yes	26	45.6 [33.6,58.2]	26	65.0 [53.4,75.1]
	No	5	8.8 [4.3,17.2]	3	7.5 [2.1,23.2]
	Not recorded	21	36.8 [26.2,48.9]	11	27.5 [15.6,43.7]
	Not applicable	5	8.8 [2.5,26.9]	0	0
			N=26		N=26
6-week result	Positive	2	7.7 [2.0,25.6]	1	3.8 [0.6,21.2]
	Negative	21	80.8 [57.4,92.9]	25	96.2 [78.8,99.4]
	Not recorded	3	11.5 [2.6,38.6]	0	0
			N=57		N=40
HIV testing at 10 weeks	Yes	10	17.5 [7.8,34.8]	20	50.0 [33.8,66.2]
	No	2	3.5 [0.9,12.9]	3	7.5 [3.0,17.6]
	Not recorded	28	49.1 [31.1,67.4]	17	42.5 [27.3,59.2]
	Not applicable	17	29.8 [19.0,43.5]	0	0
			N=10		N=20
10 week result	Positive	0	0	0	0
	Negative	9	90.0 [49.3,98.8]	19	95.0 [74.5,99.2]
	Not recorded	1	10.0 [1.2,50.7]	1	5.0 [0.8,25.5]
					N=39
HIV testing at 16-18 weeks	Yes			11	28.2 [19.3,39.2]
	No			3	7.7 [2.1,24.8]
	Not recorded			20	51.3 [34.7,67.6]
	Not applicable			5	12.8 [6.0,25.4]
					N=11
16-18 week result	Positive			0	0
	Negative			10	90.9 [55.1,98.8]
	Not recorded			1	9.1 [1.2,44.9]

EC = Eastern Cape; GP = Gauteng; KZN –KwaZulu Natal; LP=Limpopo; MP=Mpumalanga; NW = North West.
N=total number; mHIV+ = mother HIV positive; mHIV- = mother HIV negative

positive and HIV negative mothers in both the 4-14 week and 6-12 months postpartum age groups opted for exclusive breastfeeding at birth (as recorded on the RtHB). In the 4-14-week postpartum group, a significantly higher number of HIV negative mothers (74.3%) compared to HIV positive mothers (54.4%) chose to exclusively breastfeed at birth, p<0.0001. At the time of the interview, the infant feeding practice changed as the majority of mothers reported that they were using mixed feeding. Only 33.9% HIV positive and 41.1% HIV negative mothers whose infants were between 4-14 weeks reported that they were exclusively breastfeeding. At the time of the interview, 2.1% HIV positive and 6.6% HIV negative mothers whose infants were aged 6-12 months reported that they were exclusively breastfeeding.

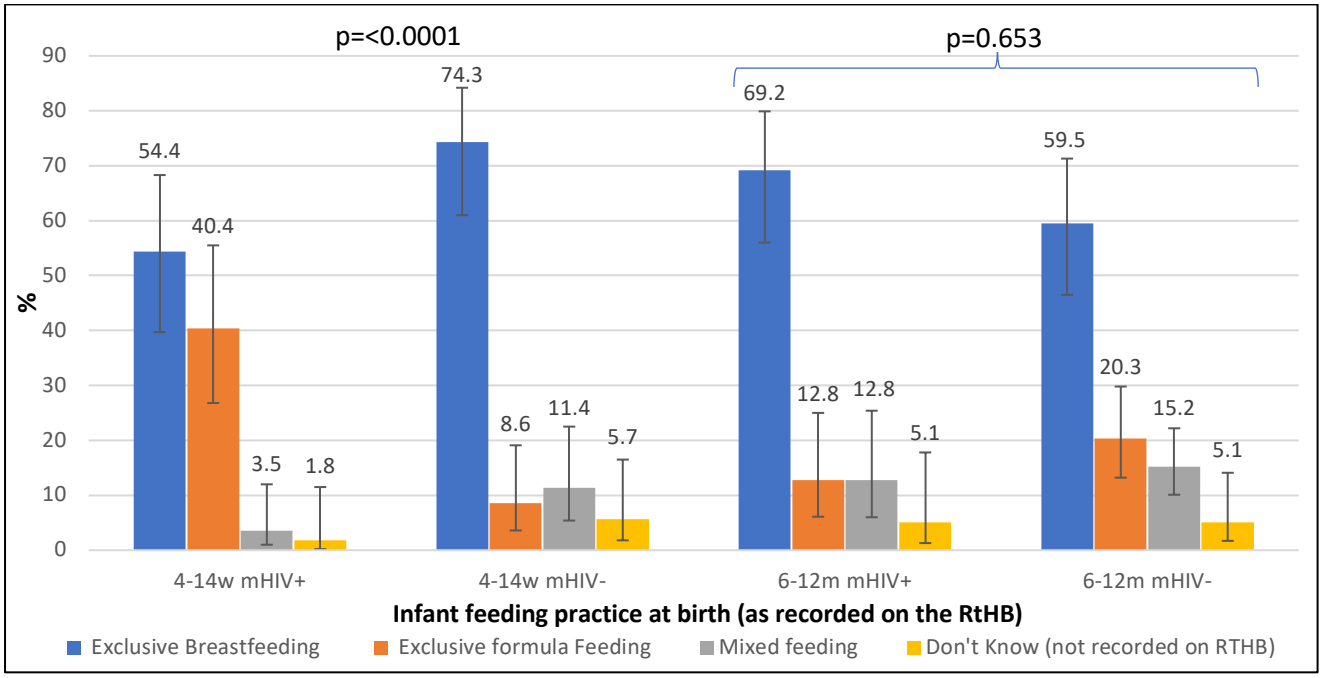


Figure 9a: Infant feeding practice at birth as recorded on the infants RtHB in Ekurhuleni - – findings from PMTCT Option B+ Evaluation in South Africa 2018

mHIV+ = mother HIV positive; mHIV- = mother HIV negative RThB = Road to Health Booklet

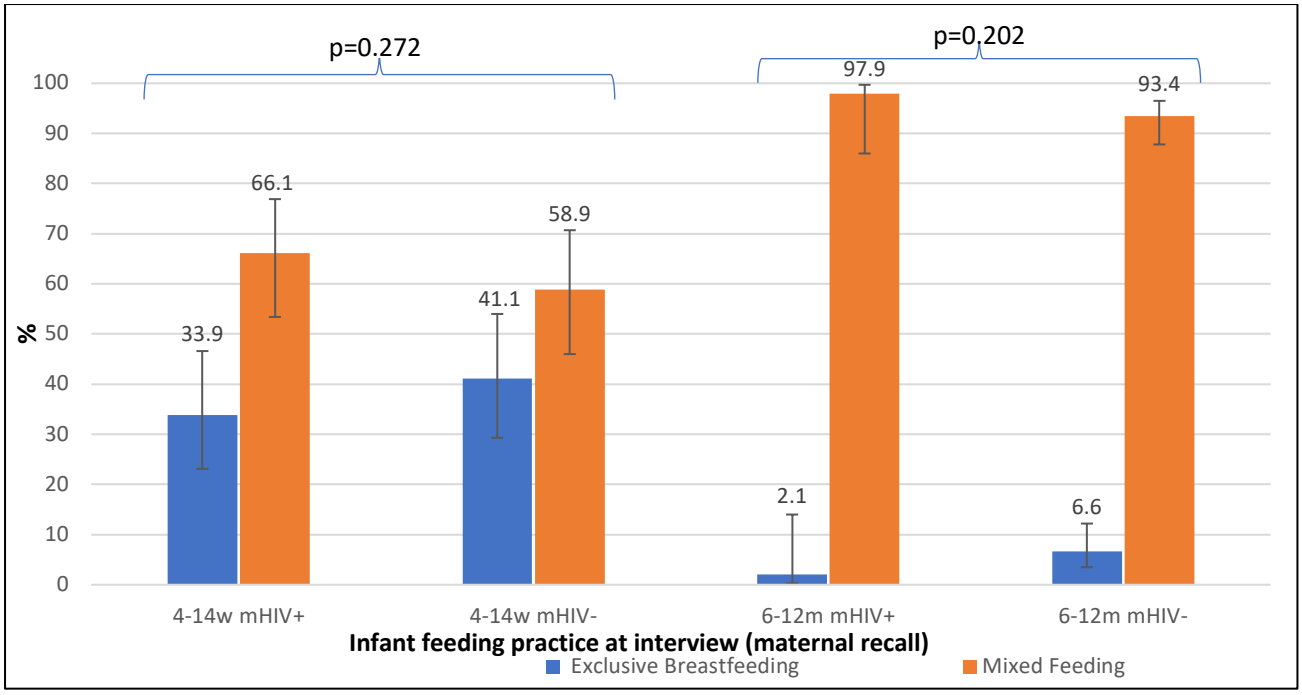


Figure 10b: Infant feeding practice at interview based on 8-day maternal recall in Ekurhuleni – findings from PMTCT Option B+ Evaluation in South Africa 2018

mHIV+ = mother HIV positive; mHIV- = mother HIV negative RthB = Road to Health Booklet

3.2.4.4 KWAZULU-NATAL: eTHEKWINI METROPOLITAN MUNICIPALITY

3.2.4.4.1 Planned pregnancy

The majority of HIV positive and HIV negative mothers in the 4-14 week and 6-12-month postpartum age groups reported that their pregnancy was unplanned, Figure 11.

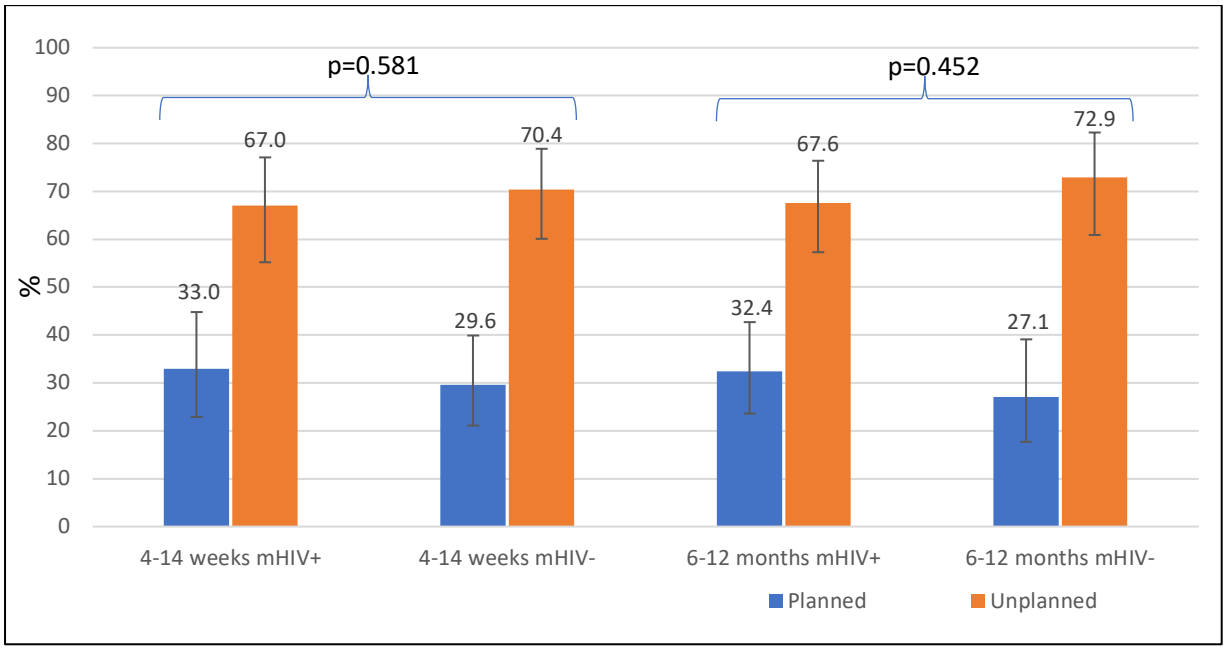


Figure 10: Planned pregnancy in eThekwini – findings from PMTCT Option B+ evaluation in South Africa, 2018

mHIV+ = mother HIV positive; mHIV- = mother HIV negative

3.2.4.4.2 Coverage of HIV testing among mother's HIV-negative mothers

Table 34 highlights the coverage of repeat HIV testing among HIV negative mothers. Pre-pregnancy HIV testing and subsequent receipt of the HIV test result was high amongst HIV negative mothers in both the 4-14-week postpartum group (76.9% and 100%, respectively) and the 6-12-month postpartum group (89.5% and 98.9%, respectively). Only 70.4% of mothers in the 4-14-week postpartum group were tested for HIV at delivery. Although maternal knowledge of 3-monthly HIV testing amongst HIV negative mothers was >80%, only 51.9% in the 4-14-week postpartum group and 72.0% in the 6-12-months postpartum group reported being tested every 3 months.

Table 34: Coverage of repeat HIV testing among HIV-negative mothers in eThekwini - findings from PMTCT Option B+ Evaluation in South Africa 2018

Characteristic	Categories	4-14 weeks mHIV-		6-12 months mHIV-	
			% (95%CI)		% (95%CI)
		N=81		N=105	
Tested for HIV infection prior to the latest pregnancy?	Yes	62	76.5 [67.0,84.0]	94	89.5 [80.6,94.6]
	No	19	23.5 [16.0,33.0]	11	10.5 [5.4,19.4]
		N=62		N=94	
Received the result of the test done prior to the latest pregnancy	Yes	62	100	93	98.9 [93.3,99.8]
	No	0	0	1	1.1 [0.2,6.7]
			N=81		N=107
Tested for HIV after delivery?	Yes	57	70.4 [57.6,80.6]	93	86.9 [78.7,92.3]
	No	24	29.6 [19.4,42.4]	14	13.1 [7.7,21.3]
		N=81		N=107	
Maternal knowledge of 3-monthly HIV testing	Yes	71	87.7 [78.4,93.3]	97	90.7 [78.2,96.3]
	No	0	0	2	1.9 [0.5,6.9]
	Don't know	10	12.3 [6.7,21.6]	8	7.5 [2.8,18.4]
		N=79		N=107	
Tested for HIV every 3 months	Yes	41	51.9 [39.8,63.8]	77	72.0 [61.9,80.2]
	No	38	48.1 [36.2,60.2]	30	28.0 [19.8,38.1]
		N=63		N=69	
Still breastfeeding	Yes	35	55.6 [42.4,68.0]	50	72.5 [58.2,83.3]
	No	28	44.4 [32.0,57.6]	19	27.5 [16.7,41.8]

mHIV+ = mother HIV positive; mHIV- = mother HIV negative

3.2.4.4.3 Maternal ART uptake

Table 35 shows the uptake of ART among mothers who self-reported as HIV positive. Most mothers were knowledgeable about Option B+:>95% of mothers in the 4-14 week and 6-12-month postpartum groups knew that mothers who tested HIV positive are started on ART immediately and >90% knew that ART is continued throughout breastfeeding. All mothers (100%) in the 4-14 weeks postpartum group and 98.2% in the 6-12 months postpartum group self-reported being on ART but 88.0% in the 4-14 weeks postpartum group and 90.4% in the 6-12 months postpartum group had this recorded in the RtHB. Most mothers reported that

they had initiated ART before pregnancy. Although a high proportion of mothers -reported being on ART at the time of the interview, only 70.1% in the 4-14 weeks postpartum group and 69.8% in the 6-12-months postpartum group reported initiating treatment immediately after HIV diagnosis without waiting for blood test results.

Table 35: Maternal ART uptake and experience amongst self-reported HIV positive mothers, ART initiated immediately following HIV diagnosis without waiting for blood test results in eThekwini - findings from PMTCT Option B+ Evaluation in South Africa 2018

Characteristic	Categories	4-14 weeks mHIV+		6-12 months mHIV+	
			% (95%CI)		% (95%CI)
		N=88		N=109	
Maternal knowledge that mothers who tested HIV positive are started on ART immediately	Yes	84	95.5 [89.8,98.0]	106	97.2 [89.1,99.4]
	No	3	3.4 [1.2,9.5]	2	1.8 [0.3,11.9]
	Don't know	1	1.1 [0.2,6.8]	1	0.9 [0.1,6.2]
		N=88		N=109	
Maternal knowledge that all HIV positive mothers get ART throughout breastfeeding	Yes	81	92.0 [85.6,95.7]	99	90.8 [80.7,95.9]
	No	4	4.5 [1.9,10.3]	3	2.8 [0.7,10.7]
	Don't know	3	3.4 [1.1,10.0]	7	6.4 [2.2,17.4]
			N=83		N=104
Mother on lifelong ART (as recorded on the RtHB)	Yes	73	88.0 [78.7,93.5]	94	90.4 [81.7,95.2]
	No	4	4.8 [2.0,11.2]	5	4.8 [1.7,12.6]
	Don't know	6	7.2 [3.0,16.2]	5	4.8 [2.3,9.9]
		N=88		N=109	
Mother on HAART	Yes	88	100	107	98.2 [92.8,99.6]
	No	0	0	2	1.8 [0.4,7.2]
		N=84		N=104	
Timing of ART initiation	Before pregnancy	49	58.3 [46.2,69.6]	61	58.7 [48.8,67.9]
	During pregnancy	34	40.5 [29.3,52.7]	39	37.5 [28.2,47.9]
	After delivery	1	1.2 [0.2,7.9]	4	3.8 [1.6,9.1]
		N=87		N=106	
ARVs initiated immediately after diagnosis without waiting for blood test results	Yes	61	70.1 [59.8,78.7]	74	69.8 [61.5,77.0]
	No	26	29.9 [21.3,40.2]	31	29.2 [22.0,37.7]
	Don't know	0	0	1	0.9 [0.1,6.7]

mHIV+ = mother HIV positive; mHIV- = mother HIV negative

3.2.4.4.4 Coverage of viral load testing

Table 36 highlights the coverage of viral load testing. The majority of mothers reported that they had been tested for viral load since they initiated ART (87.5% in the in the 4-14 week and 82.6% in the 6-12 months postpartum age group).

Table 36: Coverage of viral load testing in eThekwini - findings from PMTCT Option B+ Evaluation in South Africa 2018

Characteristic	Categories	4-14 weeks mHIV+		6-12 months mHIV+	
			% (95%CI)		% (95%CI)
Mother had a viral load test since ART initiation		(N=88)		(N=109)	
	Yes	77	87.5 [79.5,92.7]	90	82.6 [69.0,91.0]
	No	7	8.0 [3.6,16.7]	15	13.8 [6.2,28.0]
	Chooses not to answer/missing	4	4.5 [1.7,11.4]	4	3.7 [1.5,9.0]
Of those reporting to have had a viral load test:		**N=77**		**N=90**	
Viral load test result explained to mother	Yes	63	81.8 [68.0,90.5]	75	83.3 [72.9,90.3]
	No	12	15.6 [7.3,30.2]	13	14.4 [7.5,26.0]
	Chooses not to answer/missing	2	2.6 [0.6,10.5]	2	2.2 [0.3,14.3]

"No significant differences were observed between postnatal age-groups, all chi-squared p-values were>0.05."
mHIV+ = mother HIV positive; mHIV- = mother HIV negative

3.2.4.4.5 Coverage of infant HIV testing and HIV results (as recorded in the infants RtHB)

Table 37 shows coverage of infant HIV testing and results as documented on the RtHB. Amongst infants aged 4-14 weeks, birth HIV testing was recorded for 84.3% of infants with a 2.9% positivity. Ten percent (10.0%) of RtHBs did not have infant birth HIV testing recorded. HIV testing was done for 19.3% of infants at 6 weeks and 24.1% of infants at 10 weeks however 41.0% and 37.3% of infants did not have a record of HIV testing documented at these timepoints, respectively.

Among infants aged 6-12 months, birth HIV testing was recorded for 89.5% of infants with a 1.1% positivity. Approximately 5% of RtHBs did not have infant birth HIV testing recorded. HIV testing was done for 60.6% of infants at 6 weeks and 21.9% of infants at 16 weeks; however, 19.2% and 43.8% of infants did not have a record of HIV testing documented at these timepoints, respectively.

Table 37: Coverage of HIV testing and HIV results (as recorded in the infants RtHB (among infants aged 4-14 weeks and 6-12 months whose mother self-reported HIV positive in eThekwini - findings from PMTCT Option B+ Evaluation in South Africa 2018

Characteristic	Categories	4-14 weeks mHIV+		6-12 months mHIV+	
			% (95%CI)		% (95%CI)
		N=83		N=105	
Infant Birth HIV testing	Yes	70	84.3 [74.0,91.1]	94	89.5 [82.2,94.0]
	No	3	3.6 [1.2,10.1]	4	3.8 [1.6,8.9]
	Not recorded	9	10.8 [5.8,19.4]	5	4.8 [2.2,9.9]
	Not applicable	1	1.2 [0.2,7.8]	2	1.9 [0.5,7.5]
		N=70		N=94	
Birth result	Positive	2	2.9 [0.7,10.7]	1	1.1 [0.2,7.0]
	Negative	56	80 [70.4,87.0]	90	95.7 [89.9,98.3]
	Not recorded	12	17.1 [10.9,25.9]	3	3.2 [1.1,8.9]
		N=83		N=104	
HIV testing at 6 weeks	Yes	16	19.3 [11.9,29.7]	63	60.6 [49.2,70.9]
	No	23	27.7 [18.7,38.9]	15	14.4 [7.8,25.2]
	Not recorded	34	41.0 [29.1,54.0]	20	19.2 [12.1,29.1]
	Not applicable	10	12.0 [6.3,21.7]	6	5.8 [2.0,15.7]
		N=16		N=63	
6-week result	Positive	1	6.3 [1.1,28.8]	2	3.2 [0.8,11.9]
	Negative	15	93.8 [71.2,98.9]	60	95.2 [86.1,98.5]
	Not recorded	0	0	1	1.6 [0.2,10.7]
		N=83		N=105	
HIV testing at 10 weeks	Yes	20	24.1 [17.1,32.8]	64	61.0 [44.9,74.9]
	No	13	15.7 [9.9,23.9]	14	13.3 [6.7,24.7]
	Not recorded	31	37.3 [26.1,50.2]	26	24.8 [15.5,37.2]
	Not applicable	19	22.9 [13.7,35.7]	1	1.0 [0.1,6.7]
		N=20		N=64	
10-week result	Positive	1	5.0 [0.7,29.3]	0	0
	Negative	8	40.0 [20.6,63.1]	63	98.4 [89.9,99.8]
	Not recorded	11	55.0 [32.6,75.6]	1	1.6 [0.2,10.1]
				N=105	
HIV testing at 16-18 weeks	Yes			23	21.9 [13.8,33.0]
	No			21	20.0 [13.5,28.6]
	Not recorded			46	43.8 [33.3,54.9]
	Not applicable			15	14.3 [8.3,23.5]
				N=23	
16-18-week result	Positive			0	0
	Negative			22	95.7 [75.1,99.4]
	Not recorded			1	4.3 [0.6,24.9]

mHIV+ = mother HIV positive; mHIV- = mother HIV negative

3.2.4.4.6 Infant feeding practice

Figures 12a and 12b illustrate infant feeding practices at two-time points: 1) birth (as recorded on the RtHB) and 2) at the interview (based on 8-day maternal recall). The majority of HIV

positive and HIV negative mothers in both the 4-14 week and 6-12 months postpartum age groups opted for exclusive breastfeeding at birth (as recorded on the RtHB). Formula feeding at birth was high among HIV positive mothers, 30.1% and 29.8% in the 4-14 week and 6-12-month postpartum groups, respectively.

At the time of the interview, the infant feeding practice changed as the majority of mothers reported that they were using mixed feeding. Only 29.5% HIV positive and 32.1% HIV negative mothers whose infants were between 4-14 weeks reported that they were exclusively breastfeeding and 5.5% HIV positive and 4.7% HIV negative mothers whose infants were aged 6-12 months reported that they were exclusively breastfeeding.

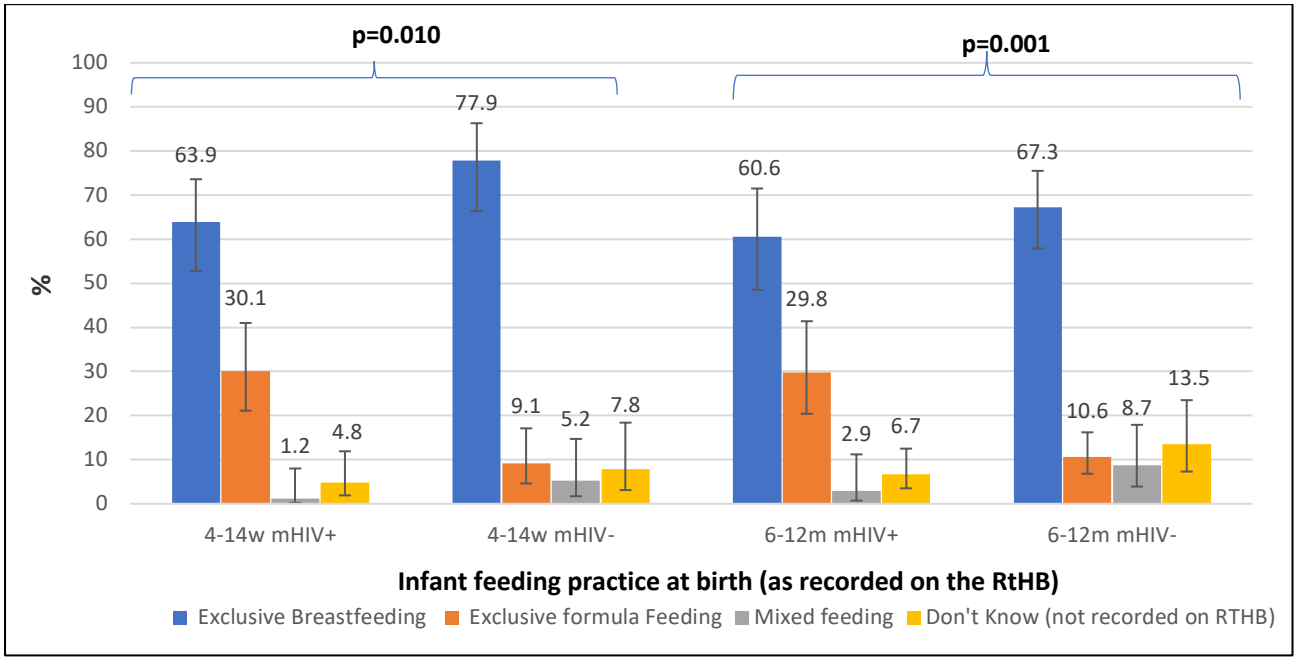


Figure 11a: Infant feeding practice at birth as recorded on the infants RtHB in eThekwini - findings from PMTCT Option B+ Evaluation in South Africa 2018

mHIV+ = mother HIV positive; mHIV- = mother HIV negative RtHB = Road to Health Booklet

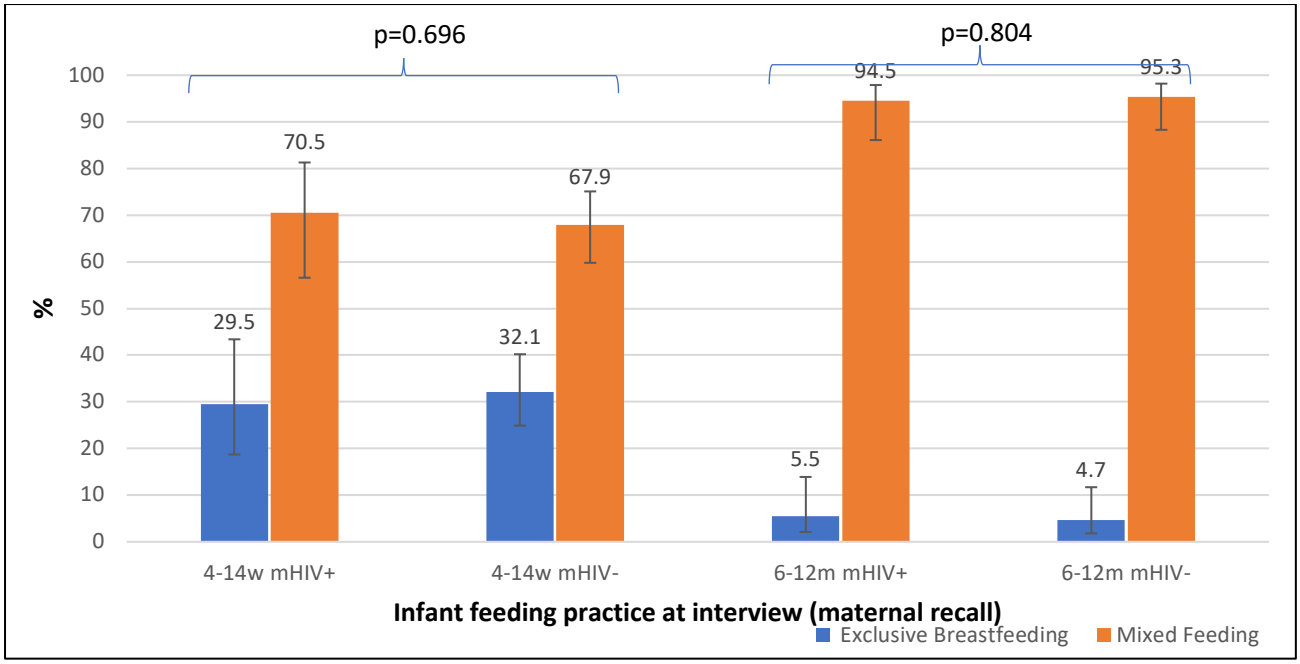


Figure 12b: Infant feeding practice at interview based on 8-day maternal recall in eThekwini - findings from PMTCT Option B+ Evaluation in South Africa 2018

mHIV+ = mother HIV positive; mHIV- = mother HIV negative

3.2.4.5 LIMPOPO: GREATER SEKHUKHUNE MUNICIPALITY

3.2.4.5.1 Unplanned pregnancy

The majority (50.4%) of HIV negative mothers in the 4-14-week postpartum age group reported that their pregnancy was unplanned, Figure 13.

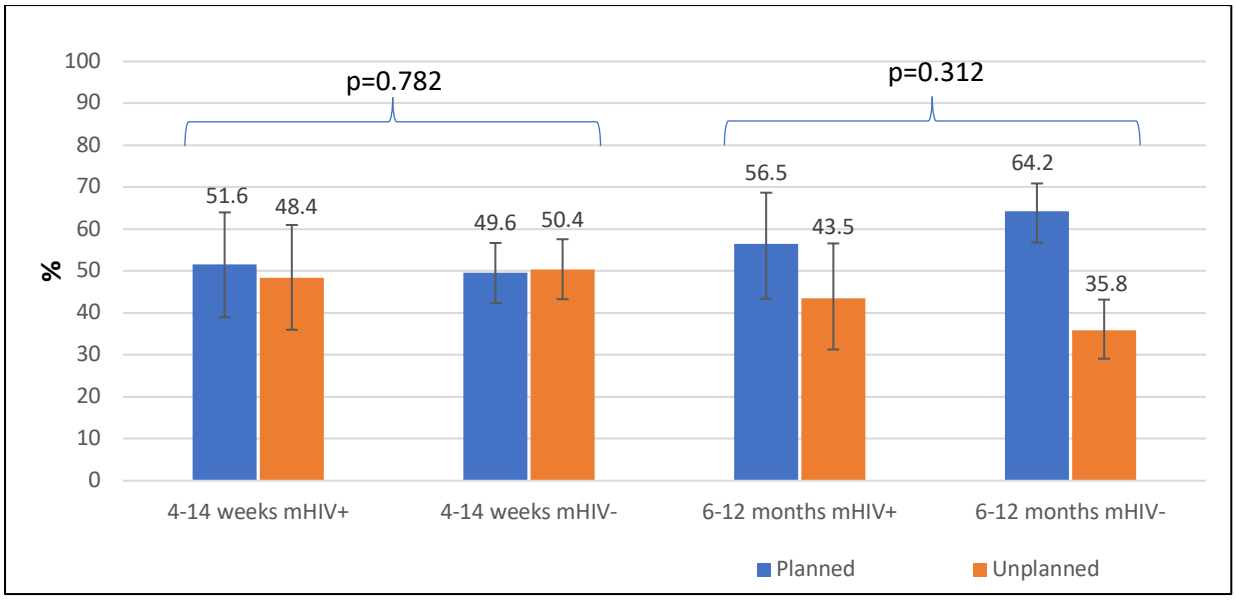


Figure 12: Planned pregnancy in Greater Sekhukhune - findings from PMTCT Option B+ Evaluation in South Africa 2018

mHIV+ = mother HIV positive; mHIV- = mother HIV negative

3.2.4.5.2 Coverage of HIV testing among mother's HIV-negative mothers

Table 38 highlights the coverage of repeat HIV testing among HIV negative mothers. Pre-pregnancy HIV testing and subsequent receipt of the HIV test result was high amongst HIV negative mothers in both the 4-14-week postpartum group (91,9% and 100% respectively) and the 6-12-month postpartum group (91.7% and 99.3% respectively). Only 80.4% of mothers in the 4-14-week postpartum group were tested for HIV at delivery. Although maternal knowledge of 3-monthly HIV testing amongst HIV negative mothers was >85%, only 45.5% in the 4-14-week postpartum group and 52.2% in the 6-12-month postpartum group reported being tested every 3 months.

Table 38: Coverage of repeat HIV testing among HIV-negative mothers in Greater Sekhukhune - findings from PMTCT Option B+ Evaluation in South Africa 2018

Characteristic	Categories	4-14 weeks mHIV-		6-12 months mHIV-	
			% (95%CI)		% (95%CI)
		N=112		N=156	
Tested for HIV infection prior to the latest pregnancy	Yes	102	91.1 [83.8,95.3]	143	91.7 [85.9,95.2]
	No	10	8.9 [4.7,16.2]	13	8.3 [4.8,14.1]
			N=102		N=143
Received the result of the test done **prior** to the latest pregnancy	Yes	102	100	142	99.3 [95.3,99.9]
	No	0	0	1	0.7 [0.1,4.7]
		N=112		N=159	
Tested for HIV after delivery	Yes	90	80.4 [70.8,87.3]	147	92.5 [88.0,95.3]
	No	22	19.6 [12.7,29.2]	12	7.5 [4.7,12.0]
		N=113		N=159	
Maternal knowledge of 3-monthly HIV testing	Yes	101	89.4 [79.9,94.7]	146	91.8 [85.5,95.5]
	No	2	1.8 [0.4,6.8]	5	3.1 [1.2,8.0]
	Don't know	10	8.8 [3.8,19.1]	8	5.0 [2.6,9.6]
			N=112		N=159
Tested for HIV every 3 months (since 2015)	Yes	51	45.5 [35.8,55.6]	83	52.2 [42.3,61.9]
	No	61	54.5 [44.4,64.2]	76	47.8 [38.1,57.7]
		N=105		N=120	
Still breastfeeding	Yes	49	46.7 [36.6,57.1]	65	54.2 [41.2,66.6]
	No	56	53.3 [42.9,63.4]	55	45.8 [33.4,58.8]

mHIV+ = mother HIV positive; mHIV- = mother HIV negative

3.2.4.5.3 Maternal ART uptake

Table 39 shows the uptake of ART among mothers who self-reported as HIV positive. Most mothers were knowledgeable about Option B+ i.e. >90% of mothers in the 4-14 week and 6-12-month postpartum groups knew that mothers who tested HIV positive are started on ART immediately and >90% knew that ART is continued throughout breastfeeding. Most mothers (95.3%) in the 4-14 weeks postpartum group and 98.4% in the 6-12month postpartum group self-reported being on ART but 80.6% in the 4-14 weeks postpartum group and 78.7% in the 6-12month postpartum group had this recorded in the RtHB. Most mothers reported that they had initiated ART before pregnancy. Although a high proportion of mothers self-reported being on ART at the time of the interview only 61.0% in the 4-14 weeks postpartum group and 71.7% in the 6-12-month postpartum group reported initiating treatment immediately after HIV diagnosis without waiting for blood test results.

Table 39: Maternal ART uptake and experience amongst self-reported HIV positive mothers, ART initiated immediately following HIV diagnosis without waiting for blood test results in Greater Sekhukhune - findings from PMTCT Option B+ Evaluation in South Africa 2018

Characteristic	Categories	4-14 weeks mHIV+		6-12 months mHIV+	
			% (95%CI)		% (95%CI)
		N=64		N=63	
Maternal knowledge that mothers who tested HIV positive are started on ART immediately	Yes	59	92.2 [82.0,96.8]	59	93.7 [85.7,97.3]
	No	1	1.6 [0.2,10.0]	3	4.8 [1.6,13.2]
	Don't know	4	6.3 [2.1,17.2]	1	1.6 [0.2,9.5]
		N=64		N=63	
Maternal knowledge that all HIV positive mothers get ART throughout breastfeeding	Yes	62	96.9 [89.4,99.1]	59	93.7 [85.5,97.4]
	No	0	0	1	1.6 [0.2,10.4]
	Don't know	2	3.1 [0.9,10.6]	3	4.8 [1.7,12.7]
		N=62		N=61	
Mother on lifelong ART (as recoded on the RtHB)	Yes	50	80.6 [68.3,89.0]	48	78.7 [67.6,86.7]
	No	0	0	1	1.6 [0.2,10.7]
	Don't know	12	19.4 [11.0,31.7]	12	19.7 [11.7,31.2]
		N=64		N=63	
Mother on HAART	Yes	61	95.3 [87.1,98.4]	62	98.4 [89.6,99.8]
	No	3	4.7 [1.6,12.9]	1	1.6 [0.2,10.4]
		N=59		N=59	
Timing of ART initiation	Before pregnancy	39	66.1 [50.4,78.9]	30	50.8 [37.1,64.5]
	During pregnancy	20	33.9 [21.1,49.6]	28	47.5 [34.5,60.8]
	After delivery	0	0	1	1.7 [0.2,11.4]
		N=59		N=60	
ARVs initiated immediately after diagnosis without waiting for blood test results	Yes	36	61.0 [46.3,73.9]	43	71.7 [57.4,82.6]
	No	23	39.0 [26.1,53.7]	17	28.3 [17.4,42.6]
	Don't know	0	0	0	0

mHIV+ = mother HIV positive; mHIV- = mother HIV negative

3.2.4.5.4 Coverage of viral load testing

Table 40 highlights the coverage of viral load testing. The majority of mothers reported that they had been tested for viral load since they initiated ART (75.0% in the in the 4-14 week and 81.0% in the 6-12 months postpartum age group).

Table 40: Coverage of viral load testing in Greater Sekhukhune - findings from PMTCT Option B+ Evaluation in South Africa 2018

Characteristic	Categories	4-14 weeks mHIV+		6-12 months mHIV+	
			% (95%CI)		% (95%CI)
Mother had a viral load test since ART initiation		(N=64)		(N=63)	
	Yes	48	75.0 [63.9,83.6]	51	81.0 [67.3,89.8]
	No	13	20.3 [12.0,32.2]	9	14.3 [6.4,28.7]
	Chooses not to answer/missing	3	4.7 [1.1,17.9]	3	4.8 [1.5,14.3]
Of those reporting to have had a viral load test:		**N=48**		**N=51**	
Viral load test result explained to mother	Yes	32	66.7 [53.3,77.8]	35	68.6 [51.7,81.7]
	No	15	31.2 [20.2,45.0]	16	31.4 [18.3,48.3]
	Chooses not to answer/missing	1	2.1 [0.3,15.3]	0	0

mHIV+ = mother HIV positive; mHIV- = mother HIV negative

3.2.4.5.5 Coverage of infant HIV testing and HIV results (as recorded in the infants RtHB)

Table 41 shows coverage of infant HIV testing and results as documented on the RtHB. Amongst infants aged 4-14 weeks, birth HIV testing was recorded for 66.1% of infants with a 22.5% positivity. Thirty two percent (32.3%) of RtHBs did not have infant birth HIV testing recorded. HIV testing was done for 27.9% of infants at 6 weeks and 4.8% of infants at 10 weeks; however, 59.0% and 41.0% of infants, respectively did not have a record of HIV testing documented at these timepoints.

Among infants aged 6-12 months, birth HIV testing was recorded for 68.9% of infants with a 19.5% positivity. Approximately 29.5% of RtHBs did not have infant birth HIV testing recorded. HIV testing was done for 59.0% of infants at 6 weeks and 14.8% of infants at 16 weeks; however, 41.0% and 67.2% of infants, respectively did not have a record of HIV testing documented at these timepoints.

Table 41: Coverage of HIV testing and HIV results (as recorded in the infants RtHB (among infants aged 4-14 weeks and 6-12 months whose mother self-reported HIV positive in Greater Sekhukhune - findings from PMTCT Option B+ Evaluation in South Africa 2018

Characteristic	Categories	4-14 weeks mHIV+		6-12 months mHIV+	
			% (95%CI)		% (95%CI)
		N=62		N=61	
Infant Birth HIV testing	Yes	41	66.1 [52.8,77.3]	42	68.9 [58.8,77.4]
	No	0	0	1	1.6 [0.2,11.0]
	Not recorded	20	32.3 [21.2,45.8]	18	29.5 [21.0,39.7]
	Not applicable	1	1.6 [0.2,10.3]	0	0
		N=40		N=41	
Birth result	Positive	9	22.5 [11.0,40.5]	8	19.5 [10.6,33.2]
	Negative	21	52.5 [39.1,65.6]	32	78.0 [63.8,87.8]
	Not recorded	10	25.0 [14.8,39.1]	1	2.4 [0.4,13.6]
		N=61		N=61	
HIV testing at 6 weeks	Yes	17	27.9 [19.3,38.4]	36	59.0 [48.9,68.5]
	No	3	4.9 [1.8,12.9]	0	0
	Not recorded	36	59.0 [46.0,70.9]	25	41.0 [31.5,51.1]
	Not applicable	5	8.2 [3.8,16.9]	0	0
		N=17		N=36	
6-week result	Positive	6	35.3 [14.5,63.7]	8	22.2 [12.6,36.2]
	Negative	6	35.3 [17.9,57.7]	24	66.7 [50.8,79.5]
	Not recorded	5	29.4 [13.8,51.9]	4	11.1 [4.3,25.9]
		N=62		N=61	
HIV testing at 10 weeks	Yes	3	4.8 [1.7,13.0]	25	41.0 [30.5,52.4]
	No	2	3.2 [0.8,11.6]	0	0
	Not recorded	37	59.7 [50.7,68.0]	33	54.1 [42.7,65.1]
	Not applicable	20	32.3 [22.9,43.3]	3	4.9 [1.7,13.7]
		N=3		N=25	
10-week result	Positive	2	66.7 [15.0,95.8]	4	16.0 [6.3,34.9]
	Negative	0	0	18	72 [51.3,86.3]
	Not recorded	1	33.3 [4.2,85.0]	3	12.0 [2.9,38.2]
				N=61	
HIV testing at 16-18 weeks	Yes			9	14.8 [8.6,24.1]
	No			5	8.2 [3.1,20.1]
	Not recorded			41	67.2 [53.8,78.3]
	Not applicable			6	9.8 [4.4,20.4]
				N=9	
16-18 week result	Positive			3	33.3 [10.9,67.0]
	Negative			5	55.6 [24.8,82.6]
	Not recorded			1	11.1 [1.5,50.6]

mHIV+ = mother HIV positive; mHIV- = mother HIV negative

3.2.4.5.6 Infant feeding

Figures 14a and 14b illustrate infant feeding practices at two-time points: 1) birth (as recorded on the RtHB) and 2) at the interview (based on 8-day maternal recall). The majority of HIV positive and HIV negative mothers in both the 4-14 week and 6-12 months postpartum age groups opted for exclusive breastfeeding at birth (as recorded on the RtHB). Formula feeding at birth was high among HIV positive mothers, 14.5% and 16.4% in the 4-14 week and 6-12-month postpartum groups respectively.

At the time of the interview, the infant feeding practice changed as the majority of mothers reported that they were using mixed feeding. Only 43.8% HIV positive and 41.6% HIV negative mothers whose infants were between 4-14 weeks reported that they were exclusively breastfeeding and 3.2% HIV positive and 5.7% HIV negative mothers whose infants were aged 6-12 months reported that they were exclusively breastfeeding.

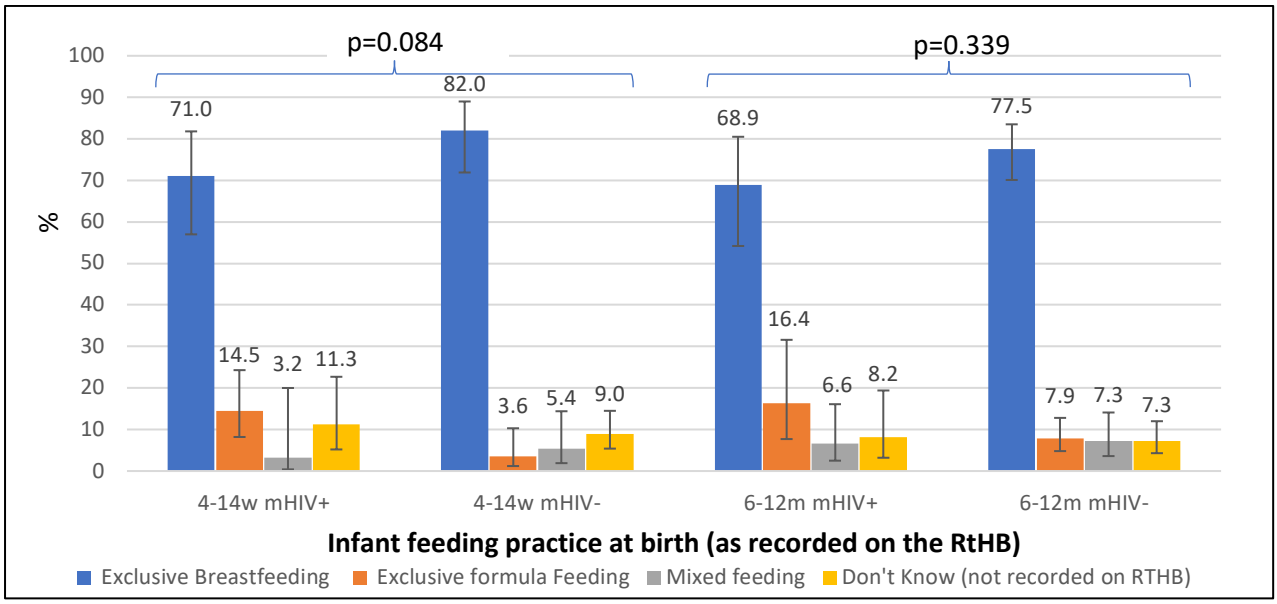


Figure 13a: Infant feeding practice at birth as recorded on the infants RtHB in Greater Sekhukhune - findings from PMTCT Option B+ Evaluation in South Africa 2018
mHIV+ = mother HIV positive; mHIV- = mother HIV negative. RtHB = Road to Health booklet

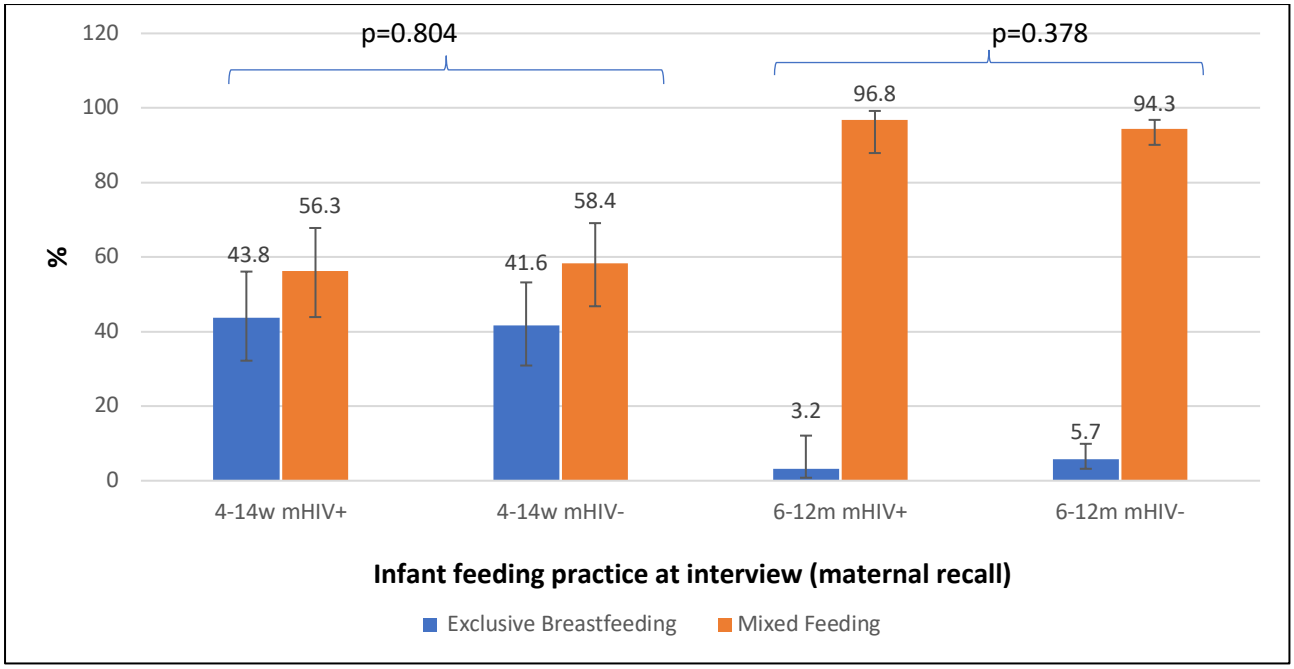


Figure 14b: Infant feeding practice at interview based on 8-day maternal recall in Greater Sekhukhune - findings from PMTCT Option B+ Evaluation in South Africa 2018

mHIV+ = mother HIV positive; mHIV- = mother HIV negative

3.2.4.6 EASTERN CAPE: OR TAMBO DISTRICT MUNICIPALITY

3.2.4.6.1 Unplanned pregnancy

The majority (50.4%) of HIV positive and negative mothers in both the 4-14-week and 6-12-month postpartum age groups reported that their pregnancy was unplanned, Figure 15.

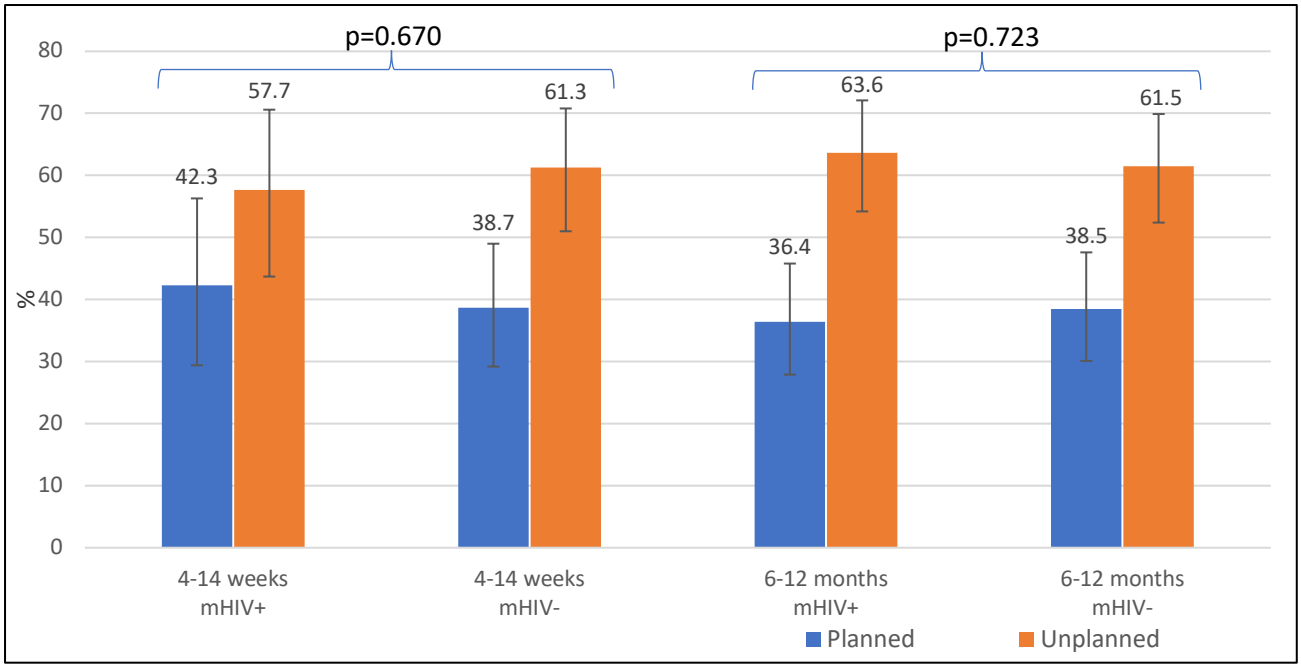


Figure 14: Planned pregnancy in OR Tambo - findings from PMTCT Option B+ Evaluation in South Africa 2018

mHIV+ = mother HIV positive; mHIV- = mother HIV negative

3.2.4.6.2 Coverage of HIV testing among mother's HIV-negative mothers

Table 42 highlights the coverage of repeat HIV testing among HIV negative mothers. Pre-pregnancy HIV testing and subsequent receipt of the HIV test result was high amongst HIV negative mothers in both the 4-14-week postpartum group (84.0% and 100%, respectively) and the 6-12-month postpartum group (83.8% and 99.0%, respectively). Only 73.3% of mothers in the 4-14-week postpartum group were tested for HIV at delivery. Although maternal knowledge of 3-monthly HIV testing amongst HIV negative mothers was >85%, only 54.1%% in the 4-14-week postpartum group and 62.3% in the 6-12-month postpartum group reported being tested every 3 months.

Table 42: Coverage of repeat HIV testing among HIV-negative mothers in OR Tambo - findings from PMTCT Option B+ Evaluation in South Africa 2018

Characteristic	Categories	4-14 weeks mHIV-		6-12 months mHIV-	
			% (95%CI)		% (95%CI)
		N=75		N=117	
Tested for HIV infection prior to the latest pregnancy	Yes	63	84.0 [75.9,89.7]	98	83.8 [76.2,89.3]
	No	12	16.0 [10.3,24.1]	19	16.2 [10.7,23.8]
			N=63		N=98
Received the result of the test done prior to the latest pregnancy	Yes	63	100	97	99.0 [93.4,99.9]
	No	0	0	1	1.0 [0.1,6.6]
		N=75		N=116	
Tested for HIV after delivery	Yes	55	73.3 [62.3,82.0]	98	84.5 [76.4,90.2]
	No	20	26.7 [18.0,37.7]	18	15.5 [9.8,23.6]
		N=75		N=117	
Maternal knowledge of 3-monthly HIV testing	Yes	65	86.7 [77.9,92.3]	107	91.5 [86.9,94.5]
	No	4	5.3 [2.1,13.1]	3	2.6 [0.9,7.0]
	Don't know	6	8.0 [3.9,15.8]	7	6.0 [3.2,11.0]
		N=74		N=114	
Tested for HIV every 3 months (since 2015)	Yes	40	54.1 [43.4,64.3]	71	62.3 [52.3,71.3]
	No	34	45.9 [35.7,56.6]	43	37.7 [28.7,47.7]
		N=62		N=64	
Still breastfeeding	Yes	35	56.5 [43.5,68.5]	40	62.5 [49.7,73.8]
	No	27	43.5 [31.5,56.5]	24	37.5 [26.2,50.3]

mHIV+ = mother HIV positive; mHIV- = mother HIV negative

3.2.4.6.3 Maternal ART uptake

Table 43 shows the uptake of ART among mothers who self-reported as HIV positive. Most mothers were knowledgeable about Option B+:>95% of mothers in the 4-14 week and 6-12-month postpartum groups knew that mothers who tested HIV positive are started on ART immediately and >95% knew that ART is continued throughout breastfeeding. Most mothers (98.1%) in the 4-14 weeks postpartum group and 98.7% in the 6-12month postpartum group self-reported being on ART but 87.8% in the 4-14 weeks postpartum group and 86.8% in the 6-12month postpartum group had this recorded in the RtHB. Most mothers reported that they had initiated ART before pregnancy. Although a high proportion of mothers self-reported being on ART at the time of the interview only 63.3% in the 4-14 weeks postpartum group and 60.5% in the 6-12-month postpartum group reported initiating treatment immediately after HIV diagnosis without waiting for blood test results.

Table 43: Maternal ART uptake and experience amongst self-reported HIV positive mothers, ART initiated immediately following HIV diagnosis without waiting for blood test results in OR Tambo - findings from PMTCT Option B+ Evaluation in South Africa 2018

Characteristic	Categories	4-14 weeks mHIV+		6-12 months mHIV+	
		n	% (95%CI)	n	% (95%CI)
		N=52		N=76	
Maternal knowledge that mothers who tested HIV positive are started on ART immediately	Yes	50	96.2 [85.9,99.0]	75	98.7 [91.6,99.8]
	No	2	3.8 [1.0,14.1]	1	1.3 [0.2,8.4]
	Don't know	0	0	0	0
		N=52		N=76	
Maternal knowledge that all HIV positive mothers get ART throughout breastfeeding	Yes	50	96.2 [85.5,99.1]	73	96.1 [89.2,98.6]
	No	1	1.9 [0.3,12.3]	3	3.9 [1.4,10.8]
	Don't know	1	1.9 [0.3,13.2]	0	0
		N=49		N=76	
Mother on lifelong ART (as recorded on the RTHB)	Yes	43	87.8 [71.6,95.3]	66	86.8 [72.2,94.4]
	No	0	0	1	1.3 [0.2,8.2]
	Don't know	6	12.2 [4.7,28.4]	9	11.8 [4.8,26.3]
			N=52		N=77
Mother on HAART	Yes	51	98.1 [88.5,99.7]	76	98.7 [91.5,99.8]
	No	1	1.9 [0.3,11.5]	1	1.3 [0.2,8.5]
		N=46		N=72	
Timing of ART initiation	Before pregnancy	25	54.3 [40.9,67.2]	44	61.1 [45.1,75.0]
	During pregnancy	21	45.7 [32.8,59.1]	27	37.5 [24.6,52.4]
	After delivery	0	0	1	1.4 [0.2,8.6]
		N=49		N=76	
ARVs initiated immediately after HIV diagnosis without waiting for blood test results	Yes	31	63.3 [48.0,76.2]	46	60.5 [49.0,71.0]
	No	18	36.7 [23.8,52.0]	30	39.5 [29.0,51.0]
	Don't know	0	0	0	0

mHIV+ = mother HIV positive; mHIV- = mother HIV negative

3.2.4.6.4 Coverage of viral load testing

Table 44 highlights the coverage of viral load testing. The majority of mothers reported that they had been tested for viral load since they initiated ART (80.8% in the in the 4-14 week and 79.2% in the 6-12 months postpartum age group).

Table 44: Coverage of viral load testing in OR Tambo - findings from PMTCT Option B+ Evaluation in South Africa 2018

Characteristic	Categories	4-14 weeks mHIV+		6-12 months mHIV+	
		n	% (95%CI)	n	% (95%CI)
Mother had a viral load test since ART initiation		(N=52)		(N=77)	
	Yes	42	80.8 [63.4,91.1]	61	79.2 [64.7,88.8]
	No	7	13.5 [5.6,28.8]	14	18.2 [9.9,31.0]
	Chooses not to answer/missing	3	5.8 [1.8,16.8]	2	2.6 [0.6,10.1]
Of those reporting to have had a viral load test:		**N=42**		**N=61**	
Viral load test result explained to mother	Yes	32	76.2 [58.2,88.0]	42	68.9 [52.1,81.8]
	No	10	23.8 [12.0,41.8]	19	31.1 [18.2,47.9]
	Chooses not to answer/missing	0	0	0	0

mHIV+ = mother HIV positive; mHIV- = mother HIV negative

3.2.4.6.5 Coverage of infant HIV testing and HIV results (as recorded in the infants RtHB)

Table 45 shows coverage of infant HIV testing and results as documented on the RtHB. Amongst infants aged 4-14 weeks, birth HIV testing was recorded for 81.6% of infants with a 2.5% positivity. Fourteen percent (14.3%) of RtHBs did not have infant birth HIV testing recorded. HIV testing was done for 32.7% of infants at 6 weeks and 4.1% of infants at 10 weeks however 49.0% and 63.3% of infants did not have a record of HIV testing documented at these timepoints respectively.

Among infants aged 6-12 months, birth HIV testing was recorded for 78.9% of infants with a 1.7% positivity. Approximately 13.2% of RtHBs did not have infant birth HIV testing recorded. HIV testing was done for 64.5% of infants at 6 weeks and 27.6% of infants at 16 weeks however 25.0% and 52.6% of infants did not have a record of HIV testing documented at these timepoints respectively.

Table 45: Coverage of HIV testing and HIV results (as recorded in the infants RtHB (among infants aged 4-14 weeks and 6-12 months whose mother self-reported HIV positive in OR Tambo - findings from PMTCT Option B+ Evaluation in South Africa 2018

Characteristic	Categories	4-14 weeks mHIV+		6-12 months mHIV+	
			% (95%CI)		% (95%CI)
		N=49		N=76	
Infant Birth HIV testing	Yes	40	81.6 [68.6,90.1]	60	78.9 [63.5,89.0]
	No	2	4.1 [1.1,13.7]	5	6.6 [2.6,15.8]
	Not recorded	7	14.3 [7.1,26.7]	10	13.2 [5.0,30.6]
	Not applicable	0	0	1	1.3 [0.2,8.2]
		N=40		N=60	
Birth result	Positive	1	2.5 [0.3,16.7]	1	1.7 [0.2,11.2]
	Negative	30	75.0 [60.0,85.7]	54	90.0 [78.8,95.6]
	Not recorded	9	22.5 [12.5,37.0]	5	8.3 [3.3,19.6]
		N=49		N=76	
HIV testing at 6 weeks	Yes	16	32.7 [21.0,47.0]	49	64.5 [54.3,73.5]
	No	4	8.2 [2.6,22.6]	7	9.2 [4.0,20.0]
	Not recorded	24	49.0 [36.9,61.2]	19	25.0 [15.4,37.9]
	Not applicable	5	10.2 [4.3,22.1]	1	1.3 [0.2,8.2]
		N=16		N=48	
6-week result	Positive	0	0	1	2.1 [0.3,14.1]
	Negative	13	81.3 [54.6,94.0]	40	83.3 [67.2,92.4]
	Not recorded	3	18.8 [6.0,45.4]	7	14.6 [6.2,30.7]
		N=49		N=76	
HIV testing at 10 weeks	Yes	2	4.1 [1.1,13.7]	33	43.4 [32.8,54.7]
	No	7	14.3 [7.4,25.9]	10	13.2 [6.6,24.5]
	Not recorded	31	63.3 [48.4,76.0]	31	40.8 [27.3,55.8]
	Not applicable	9	18.4 [9.5,32.4]	2	2.6 [0.7,9.6]
		N=2		N=33	
10-week result	Positive	0	0	0	0
	Negative	1	50 [5.7,94.3]	30	90.9 [69.5,97.8]
	Not recorded	1	50 [5.7,94.3]	3	9.1 [2.2,30.5]
				N=76	
HIV testing at 16-18 weeks	Yes			21	27.6 [17.9,40.1]
	No			14	18.4 [9.2,33.6]
	Not recorded			40	52.6 [37.8,67.0]
	Not applicable			1	1.3 [0.2,8.2]
				N=21	
16-18-week result	Positive			0	0
	Negative			20	95.2 [71.5,99.4]
	Not recorded			1	4.8 [0.6,28.5]

mHIV+ = mother HIV positive; mHIV- = mother HIV negative

3.2.4.6.6 Infant feeding

Figures 16a and 16b illustrate infant feeding practices at two-time points: 1) birth (as recorded on the RtHB) and 2) at the interview (based on 8-day maternal recall). The majority of HIV positive and HIV negative mothers in both the 4-14 week and 6-12 months postpartum age groups opted for exclusive breastfeeding at birth (as recorded on the RtHB). Formula feeding at birth was high among HIV positive mothers, 20.4% and 18.4% in the 4-14 week and 6-12-month postpartum groups, respectively.

At the time of the interview, the infant feeding practices changed as the majority of mothers reported that they were using mixed feeding. Only 26.9% HIV positive and 22.7% HIV negative mothers whose infants were between 4-14 weeks reported that they were exclusively breastfeeding and 6.5% HIV positive and 0.9% HIV negative mothers whose infants were aged 6-12 months reported that they were exclusively breastfeeding.

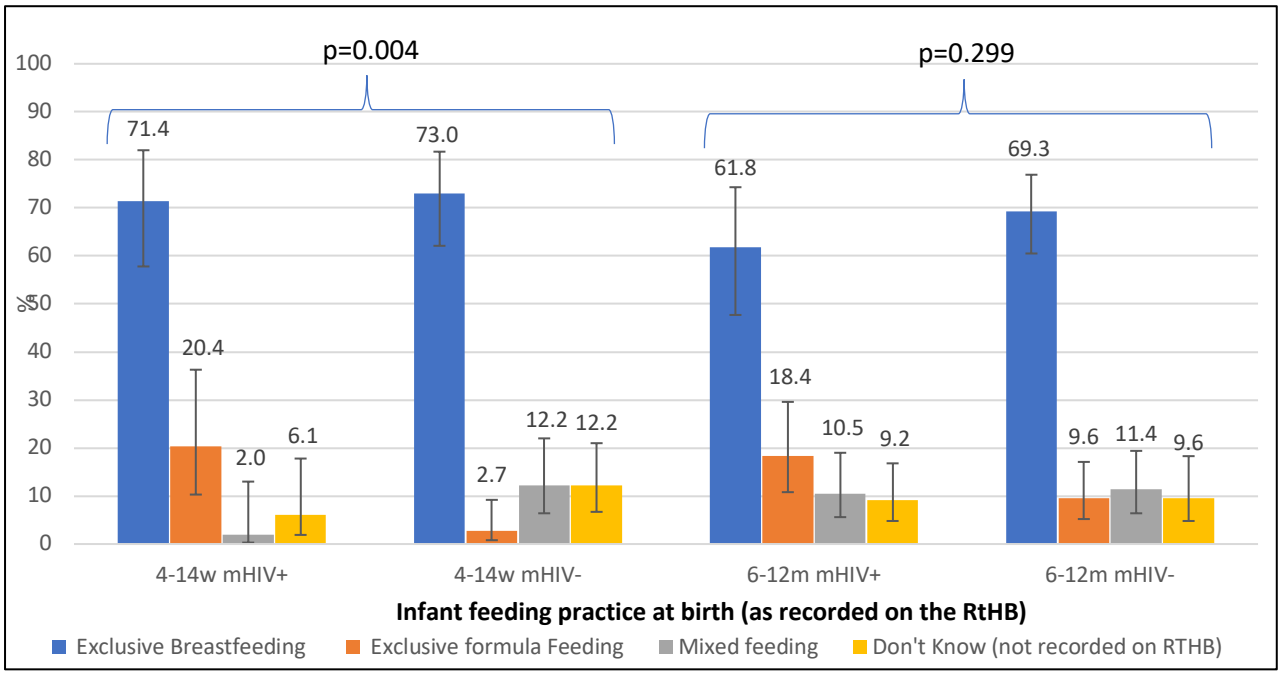


Figure 15a: Infant feeding practice at birth as recorded on the infants RtHB, OR Tambo - findings from PMTCT Option B+ Evaluation in South Africa 2018

mHIV+ = mother HIV positive; mHIV- = mother HIV negative. RtHB = Road to Health Booklet

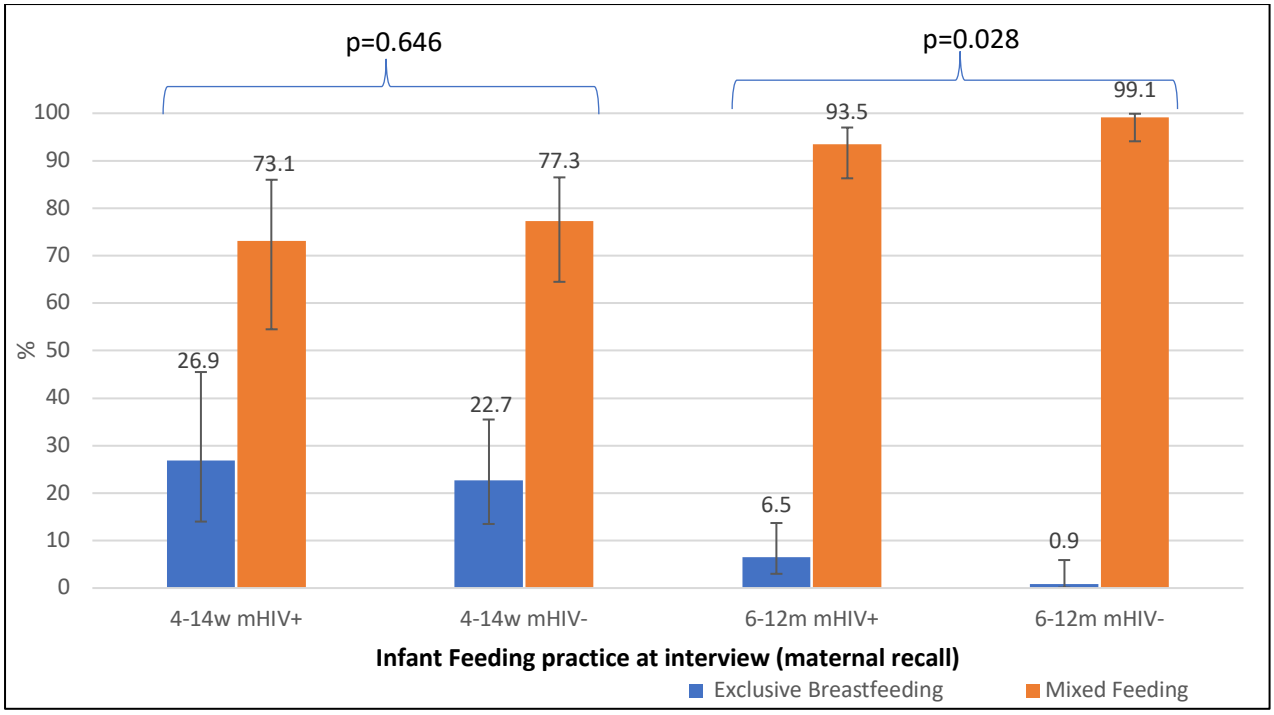


Figure 16b: Infant feeding practice at interview - based on 8day maternal recall, OR Tambo

- findings from PMTCT Option B+ Evaluation in South Africa 2018

mHIV+ = mother HIV positive; mHIV- = mother HIV negative