AN INVESTIGATION INTO THE MOST APPROPRIATE PREDICTION METHOD FOR BIRTH OUTCOMES AND MATERNAL MORBIDITY, AND THE INFLUENCE OF SOCIOECONOMIC STATUS IN A GROUP OF PREGNANT WOMEN IN KHAYELITSHA, SOUTH AFRICA

by

Hilary Davies

Thesis presented in partial fulfilment of the requirements for the degree of Master of Nutrition at the University of Stellenbosch

Supervisor : Mrs Janicke Visser
Co-supervisor: Prof Mark Tomlinson

Faculty of Health Science
Department of Interdisciplinary Health Sciences
Division of Human Nutrition

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DECLARATION

By submitting this thesis electronically, I declare that the entirety of the work contained therein is my own, original work, that I am the owner of the copyright thereof and that I have not previously in its entirety or in part submitted it for obtaining any qualification.

Signature:              Date: December 2010
ABSTRACT

Introduction
The health status of women in peri-urban areas has been influenced by the South African political transition. Despite some progress, maternal and child mortality rates are still unacceptably high. A mother’s nutritional status is one of the most important determinants of maternal and birth outcomes. The Institute of Medicine’s pre-pregnancy Body Mass Index (BMI) method is not always appropriate to use in a peri-urban setting as many women attend their first antenatal clinic later on in their pregnancy. Two alternative methods, the gestational BMI (GBMI) and the gestational risk score (GRS), have been used elsewhere to screen for at risk pregnancies, but have not been used in a South African peri-urban setting. Furthermore, examining socio-economic variables (SEV) aids in the explanation of the impact of social structures on an individual. Risk factors can then be established and pregnant women in these higher risk groups can be identified and given additional antenatal clinic appointments and priority during labour.

Aim
The first aim was to investigate the strength of the GBMI and GRS methods for predicting birth outcomes and maternal morbidities. The second aim was to investigate the relationships between SEV, GBMI and maternal morbidities.

Methods
This was a sub-study of the Philani Mentor Mothers Study. A sample of 103 and 205 were selected for investigating the prediction methods and SEV respectively. Maternal anthropometry, gestational weeks and SEV were obtained during interviews before birth. Information obtained was used to calculate GBMI and GRS and to assess the SEV. Birth outcomes were obtained from the infant’s clinic cards and maternal morbidities were obtained from interviews two days after the birth.
Results
No significant association was found between GBMI and birth outcomes and maternal morbidities. A significant positive association was found between GRS and birth head circumference percentile ($r=0.22$, $p<0.05$). The higher the GRS, the higher the risk of an infant spending longer time in the hospital ($\chi^2 = 4$, $p<0.05$). A significant positive association was found between GBMI and the following SEV factors; age ($r=0.33$, $p<0.05$), height ($r=0.15$, $p<0.05$), parity ($r=0.23$, $p<0.05$), income ($r=0.2$, $p<0.05$), marital status ($\chi^2 = 9.35$, $p<0.05$), employment ($U=2.9$, $p<0.05$) and HIV status ($U=2.54$, $p<0.05$). No statistically significant relationships were found between gestational hypertension and gestational diabetes mellitus and SEV.

Conclusion
From the findings of this sub-study there were some promising results, however it is still unclear as to which method is the most appropriate to predict adverse birth outcomes and maternal morbidity. It is recommended that the GBMI and GRS once-off methods be repeated in a larger population to see if there are more parameters that could be predicted. Women who were older, shorter, married, had more pregnancies, HIV negative and had a higher socio-economic status tended to have a greater GBMI. This can lead to adverse birth outcomes and increases the risk of women developing maternal morbidities and other chronic diseases later in their life. Optimal nutrition and health promotion strategies targeting women before conception should be implemented.
OPSOMMING

Inleiding
Die gesondheidstatus van vroue in semi-stedelike areas is beïnvloed deur die Suid-Afrikaanse politiese oorgang. Ten spyte van 'n mate van vooruitgang is die sterftesyfers vir moeders en kinders steeds onaanvaarbaar hoog. ’n Moeder se voedingstatus is een van die mees belangrike bepalende faktore van moeder- en geboorteutkomste. Die Instituut van Geneeskunde se voor-sawangerskap Liggaamsmassa Indeks (LMI) metode is nie altyd toepaslik om te gebruik in 'n semi-stedelike opset nie aangesien baie vroue hul eerste voorgeboorte-kliniek eers later in hul swangerskap bywoon. Twee alternatiewe metodes, die swangerskap LMI (SLMI) en die swangerskap risikotelling (SRT) is al elders gebruik as sifting vir hoë risiko swangerskappe, maar is nog nie gebruik in 'n Suid-Afrikaanse semi-stedelike opset nie. Vervolgens kan 'n ondersoek na sosio-ekonomiese veranderlikes (SEV) help om die impak van maatskaplike strukture op 'n individu te verduidelik. Risiko faktore kan dan vasgestel word en swanger vroue wat in hierdie hoër risiko groepe val kan geïdentifiseer word. Dié vroue kan addisionele voorgeboorte-kliniek afsprake ontvang asook voorkeurbehandeling tydens die geboorteproses.

Doelstellings
Die eerste doelstelling was om die sterkte van die SLMI en SRT metodes te ondersoek as voorspellers van geboorte uitkomste en moeder-morbiditeite. Die tweede doelstelling was om die verhoudings tussen SEV, SLMI en moeder-morbiditeite te ondersoek.

Metodes
Hierdie projek was 'n sub-studie van die Philani Mentor Moeders Studie. 'n Steekproefgrootte van 103 en 205 was geselekteer om onderskeidelik die voorspeller metodes en SEV te ondersoek. Die moeder se antropometrie, swangerskap weke en SEV was verkry gedurende onderhoude voor geboorte. Informasie ingewin was gebruik om die SLMI en SRT te bereken en om die SEV te ondersoek. Geboorteutkomste was verkry vanaf die babas se
kliniekaarte en moeder-morbiditeite was verkry tydens onderhoude twee dae na die geboorte.

**Resultate**
Geen betekenisvolle assosiasie was gevind tussen SLMI, geboorteuitkomste en moeder-morbiditeite nie. 'n Betekenisvolle positiewe assosiasie was gevind tussen SRT en die geboorte kopomtrek persentiel \( r=0.22, p<0.05 \). Hoe hoër die SRT, hoe hoër die risiko dat 'n baba langer in die hospitaal sou bly (Kruskal Wallis \( X^2=4, p<0.05 \)). 'n Betekenisvolle positiwe assosiasie was gevind tussen SLMI en die volgende SEV faktore: ouderdom \( r=0.33, p<0.05 \), lengte \( r=0.15, p<0.05 \), pariteit \( r=0.23, p<0.05 \), inkomste \( r=0.2, p<0.05 \), huwelikstatus \( X^2=9.35, p<0.05 \), besit van 'n identiteitsdokument \( U=1.75, p<0.05 \), werkstatus \( U=2.9, p<0.05 \) en MIV status \( U=2.54, p<0.05 \). Geen statisties beduidende verhoudings was gevind tussen swangerskap hipertensie, swangerskap diabetes mellitus en SEV nie.

**Gevolgtrekking**
Sommige bevindinge van hierdie sub-studie dui op belowende resultate, alhoewel dit steeds nie duidelijk is watte r metode die mees toepaslike is om ongewenste geboorteuitkomste en moeder-morbiditeit te voorspel nie. Dit word aanbeveel dat die SLMI en SRT eenmalige metodes herhaal word in 'n groter populasie om te sien of daar meer parameters is wat voorspel kan word. Vroue wat ouer, korter, getroud, meer swangerskappe, MIV negatief en 'n hoër sosio-ekonomiese status gehad het was geneig om 'n hoër SLMI te hê. Dit kan lei tot ongewenste geboorteuitkomste en verhoogd risiko om moeder-morbiditeite en ander chroniese siektes later in hul lewe te ontwikkel. Optimale voeding en gesondheidsbevordering strategieë wat vroue teken voor bevragting behoort geïmplementeer te word.
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<td>Acquired immune deficiency syndrome</td>
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<tr>
<td>BMI</td>
<td>Body mass index</td>
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<td>BUN</td>
<td>Blood urea nitrogen</td>
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<td>GBMI</td>
<td>Gestational body mass index</td>
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<td>GDM</td>
<td>Gestational diabetes mellitus</td>
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<td>Gestational impaired glucose tolerance</td>
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<td>Hypertension</td>
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<td>Impaired glucose tolerance</td>
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<td>IOM</td>
<td>Institute of Medicine</td>
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<td>Intra-uterine growth retardation</td>
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<td>LGA</td>
<td>Large for gestational age</td>
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<td>LBW</td>
<td>Low birth weight</td>
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<td>MDG</td>
<td>Millennium development goals</td>
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<td>MUAC</td>
<td>Mid upper arm circumference</td>
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<td>NCCEMD</td>
<td>National Committee for the Confidential Enquiry into Maternal Death</td>
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<td>PIHD</td>
<td>Pregnancy induced hypertension disorders</td>
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<td>PPIP</td>
<td>Perinatal Problem Identification Programme</td>
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<td>SADHS</td>
<td>South African Demographic and Health Survey</td>
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CHAPTER 1
INTRODUCTION AND LITERATURE REVIEW
1.1 INTRODUCTION AND LITERATURE REVIEW

A mother’s nutritional status is one of the most important determinants of an infant’s birth-weight and birth outcomes. There are various methods of measuring nutritional status during pregnancy. The majority of these methods require the pregravid weight and Body Mass Index (BMI) of a pregnant woman and for her to attend regular antenatal clinic appointments. The overall attendance at antenatal clinics has increased in South Africa by 25%, mainly due to the implementation of basic free health care for pregnant women and children below the age of six in 1994. The mean number of antenatal visits in South Africa is 3.8, with the Western Cape having the highest continuous attendance of 4.9. Nevertheless, the reality in a township setting is that many women attend these clinics later on in their pregnancy (mean = 5.5 months). The pre-pregnancy weight and BMI are therefore not always measured or known.

Examining socio-economic status (SES) explains the impact of social structures on an individual. The knowledge and the establishment of the influence of an individual’s SES can assist in the prevention of the development of maternal morbidities and adverse birth outcomes. The most recent study looking at SES in the South African population was the South African Demographic and Health Survey (SADHS) in 2003. The relationship between socioeconomic variables (SEV) and health status in economically active subjects in the Western Cape has been looked at recently by Stellenberg et al, (2008) in the coloured population and Malhotra, (2008) in the black African population in the Western Cape. Unfortunately there are very few studies that look at the SEV as predictors of health, especially in pregnant women in the black South African population.

A reliable and uni-occasion prediction method is needed to increase awareness of possible adverse birth outcomes and maternal morbidity. There is also a need for the determination of a relationship between SEV and gestational BMI (GBMI) and maternal morbidities. The understanding of the
influence of specific SEV is important for the development of public health policy. Both of these outcome results are essential in the development and implementation of appropriate public health intervention programmes for mothers.

1.2 MATERNAL AND CHILD HEALTH

1.2.1 Millennium Development Goals
The Millennium Development Goals (MDG) were implemented by the United Nations in 1990, and consist of, amongst others, reducing child mortality by two thirds (MDG number 4) and maternal mortality by 75% (MDG number 5) by 2015. These were the two significant goals for improving maternal and child health. In a World Health Organisation (WHO) systematic review it was found that the two main causes of maternal death in Africa were haemorrhages (33.9%) and hypertensive disorders (9.2%). Since 1990, most countries have been able to reduce their child mortality rates, however there has been an increase in 12 countries, including South Africa. Prematurity is dangerous in low to middle-income countries as intensive care facilities are not always adequate. Ninety-eight percent of worldwide neonatal deaths are in low-income countries.

1.2.2 Maternal and Child Health in South Africa
Maternal and child health was declared one of the top health priorities after the African National Congress came into power in South Africa in 1994. Numerous public health policies were implemented, but the two that impacted on maternal and child health were the creation of 1300 primary health care facilities and free health care given to children under the age of six as well as all pregnant and lactating women.

1.2.2.1 Maternal health in South Africa
With regards to maternal health, the above-mentioned policies helped improve antenatal clinic attendance. A large percentage of all pregnant women now attend at least one antenatal clinic, although this has decreased
slightly from 94% (1998) to 92% (2003). Women in low to middle-income countries are more likely to attend antenatal clinics later in their pregnancy. In South Africa, the average gestational age for the first antenatal visit is 5.5 months. There is still a concern about the poor treatment of pregnant women and the cost of transport to the clinics and therefore initial and follow-up appointments may be missed.

It has been difficult to estimate the difference the policies have made to maternal mortality as it only became compulsory to report all maternal deaths to the National Committee for the Confidential Enquiry into Maternal Deaths (NCCEMD) in 1997. It is thought that with the increase of Human Immunodeficiency Virus/Acquired Immune Deficiency Syndrome (HIV/AIDS) and the poor condition of antenatal clinics and midwifery obstetric units, maternal mortality has probably increased in South Africa, since 1997. Maternal mortality is still high at 2500 per annum and a lifetime risk of 1 in 110. It has been estimated that approximately 38% of maternal deaths could have been prevented if the conditions of the midwifery obstetric units and district hospitals had been improved.

Table 1.1 illustrates the disparity between the WHO review and South African NCCEMD figures on the major contributors to maternal mortality. The discrepancy with regards to haemorrhage could be due to the availability of blood for emergencies in the midwifery obstetric units in South Africa compared to the rest of Africa. The higher incidence and prevalence of Hypertension (HPT) may be due to, among other, the higher prevalence (>50%) of overweight and obese women in South Africa. Both the WHO and South African HIV/AIDS figures may be an underestimate as the WHO found that the HIV/AIDS status in three quarters of maternal deaths was unknown. The reason the NCCEMD figure for infection is higher could be due to the fact that they included non-pregnancy related infections, including HIV/AIDS related infections.
TABLE 1.1: Contributors to maternal mortality in the WHO systematic review and the NCCEMD\textsuperscript{11,14}

<table>
<thead>
<tr>
<th>Cause of Maternal death</th>
<th>WHO review (Africa) %</th>
<th>NCCEMD figures (South Africa) %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Haemorrhage</td>
<td>33.9</td>
<td>13.4</td>
</tr>
<tr>
<td>Hypertensive disorders</td>
<td>9.1</td>
<td>19.1</td>
</tr>
<tr>
<td>HIV/AIDS</td>
<td>6.2</td>
<td>14-15</td>
</tr>
<tr>
<td>Sepsis and Infection</td>
<td>9.7*</td>
<td>8.3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>37.8 (non-pregnancy related)</td>
</tr>
<tr>
<td>Abortion and Ectopic pregnancy</td>
<td>3.9</td>
<td>0.5</td>
</tr>
<tr>
<td>Obstructed labour</td>
<td>4.1</td>
<td>**</td>
</tr>
<tr>
<td>Anaemia</td>
<td>3.7</td>
<td>**</td>
</tr>
<tr>
<td>Pre-existing maternal disease</td>
<td>**</td>
<td>5.6</td>
</tr>
</tbody>
</table>

*Figures combined  
**Figures not available

The number of women who gave birth in a health facility in South Africa increased from 83% in 1998 to 89% in 2003.\textsuperscript{5} However, in peri-urban settings, only 24% of births were performed by a skilled health personnel.\textsuperscript{5} Doctors are more likely to perform deliveries on older women (over 35 years) and in urban areas.\textsuperscript{5} The percentage of births performed by a doctor was higher in the Western Cape (39.1%), but less than a third of these were in black African women.\textsuperscript{5} In the Western Cape, 33.6% of deliveries are caesarian sections and of these only 21.1% were on black African women.\textsuperscript{5} Most women are discharged six hours after a natural birth and three days after a caesarean birth from the midwifery obstetric units.\textsuperscript{5,13} There needs to be a more accurate way to classify women at risk, in order for high risk births to be carried out by a doctor and more post-partum care given.\textsuperscript{5}

1.2.2.2 Child health in South Africa

South Africa is one of the 12 countries in the world where infant mortality has increased from 1990 to 2006.\textsuperscript{15,20} It was found that countries with an increase in child mortality had a high maternal mortality and high HIV prevalence.\textsuperscript{15,20} The Perinatal Problem Identification Programme (PPIP) audits avoidable
perinatal deaths in South Africa.\textsuperscript{18} It has been used nationally since 2000 and to date five reports have been generated.\textsuperscript{18} Statistics from approximately 40\% of midwifery obstetric units, district, regional and provincial hospitals are obtained.\textsuperscript{11,18} It was established that the most common causes of neonatal death were unexplained stillbirths (24\%), placental disease (23\%), spontaneous premature deliveries (23\%), and labour related problems (17\%).\textsuperscript{12,18,21,22} The 2009 Saving Babies report affirmed that due to poor intrapartum care, 44\% of the deaths due to labour were avoidable.\textsuperscript{18} Neonatal deaths are higher in the following socio-economic groups; urban, especially in the black African population, no education or grade 8-11 education, male children, maternal age over 35 years, first births, mothers with more than four children and children that are born with less than two years birth interval.\textsuperscript{5,18} With regards to neonatal death, the SADHS (2003) statistics need to be interpreted with caution as they do not seem to agree with previous surveys. The lowest number of neonatal deaths in South Africa occurs within the Western Cape.\textsuperscript{5}

1.3 ADVERSE PREGNANCY AND BIRTH OUTCOMES

1.3.1 Definitions of Birth Outcomes

1.3.1.1 Low birth weight (LBW) and very low birth weight infants (VLBW)

LBW and VLBW are defined when the birth mass of an infant is less than 2500 and 1500 grams respectively.\textsuperscript{23,24} This occurs either because the infant is born early or born small for gestational age (SGA) due to intrauterine growth restriction (IUGR).\textsuperscript{23,24} Women who have had a previous stillbirth and have a low BMI have an increased risk for giving birth to a LBW infant.\textsuperscript{25} LBW usually arises if there is inadequate maternal nutrition, the mother smokes and/or drinks alcohol or the mother is stressed or distressed.\textsuperscript{26,27} LBW indirectly increases the risk of perinatal and infant mortality.\textsuperscript{25,26} These infants have an increased risk of developing necrotizing enterocolitis, bronchopulmonary dysplasia, growth and developmental delay.\textsuperscript{23,24} LBW
infants also have increased risk factors for poor health during their childhood and are at a higher risk of developing malnutrition in the first five years of life.\textsuperscript{28,29,30} IUGR and LBW can lead to an increased risk of developing a high BMI and metabolic syndrome later in life.\textsuperscript{31}

### 1.3.1.2 Preterm infants

If an infant is born before 37 weeks, the infant is classified as being preterm.\textsuperscript{32,33} Lower socioeconomic status, lower education level, single marital status, low income, teenage mothers, genetic factors, poor prenatal care, low maternal weight gain, lower BMI, inadequate birth spacing, multiple births, pregnancy induced hypertension, placental insufficiency, uterine abnormalities, infections during pregnancy, rupture of membranes, previous preterm delivery, heavy work and stress are all risk factors for a preterm birth.\textsuperscript{25,34} Smoking is associated with very early delivery (before 32 weeks).\textsuperscript{34}

Preterm infants frequently have an immature gastrointestinal tract, lungs, kidneys, liver and heart.\textsuperscript{32,33} The risk of perinatal mortality is also increased with a preterm birth.\textsuperscript{32}

### 1.3.1.3 Intrauterine growth restriction

IUGR is defined as poor growth of the foetus in the womb.\textsuperscript{27} The weight of infants who have IUGR fall below the tenth percentile for gestational age.\textsuperscript{27}

The risk factors for developing IUGR are low maternal energy intake, low preconception BMI, short stature, maternal infections, abnormal placental blood flow, foetal infections, primi-parity, pregnancy induced hypertension, smoking and malaria.\textsuperscript{27}

### 1.3.1.4 Small for gestational age Infants (SGA)

SGA is defined when the mass of an infant is less than the tenth percentile for its gestational age.\textsuperscript{33} Women who smoke during pregnancy often give birth to SGA babies.\textsuperscript{35} Smoking decreases the placental blood flow and therefore restricts the nutrients available to the foetus.\textsuperscript{35} Women who have pregnancy induced hypertension are also at risk of delivering a SGA infant.\textsuperscript{25} SGA infants have limited fat and glycogen stores and have a higher energy
They are therefore at risk of developing hypoglycaemia and growth delay. They are therefore at risk of developing hypoglycaemia and growth delay.

1.3.1.5 Large for gestational age infants (LGA)
LGA is defined when the mass of the infant is greater than the ninetieth percentile for its gestational age. Boney et al (2005) found that children who were born LGA had more of a risk of developing the metabolic syndrome if they had a mother with GDM and/or obesity. Obesity in the absence of GDM is also association with an increased risk of a child developing metabolic syndrome in later life. 

1.3.1.6 Macrosomia
Macrosomia is defined when the mass of an infant is greater than >4500 grams. An infant can be both macrosomic and LGA. The adverse effects of macrosomia for maternal health are the following: postpartum haemorrhage and necessity for caesarean section. Macrosomia increases the risk of an infant having shoulder dystocia (failure of shoulder to emerge after the foetal head during delivery), chorioamnionitis (inflammation of foetal membranes), forth degree lacerations, prolonged hospital stay, neonatal death, asphyxia, meconium aspiration and becoming overweight in childhood.

1.3.1.7 Neonatal death
Neonatal death is defined when the death of an infant occurs before one month of age. Approximately four million neonatal deaths occur each year and 98% of these are found in developing countries. Prematurity was found to be the leading cause of neonatal death (60.5%) in a study looking at 7993 pregnancies in developing countries in which there were 71 neonatal deaths. Other factors that were found to cause neonatal death were infection and birth asphyxia.

1.3.1.8 Perinatal death
A perinatal death is defined when a miscarriage or spontaneous abortion occurs before 20 weeks. It is more common in the first 12 weeks of
pregnancy. Risk factors for a miscarriage are inconclusive, but the following have been thought to be contributing factors: maternal age over 35 years, maternal underweight and overweight, infertility problems, previous termination, stress and alcohol use. The causes for many miscarriages is still unknown and not linked to any of the above risk factors.

1.3.1.9 Stillbirth
Stillbirths are defined as foetal death after 20 weeks. In the study by Nguyen Ngoc, (2006) the rate of stillbirths was 12.5 per 1000 in poor-middle income countries (Argentina, Egypt, India, Peru, South Africa and Vietnam). Some risk factors for stillbirths are IUGR, macrosomia, gestational hypertensive disorders, smoking and pre-pregnancy obesity.

1.3.2 Adverse Pregnancy and Birth Outcomes with High or Low Pregravid Body Mass Index (BMI)

1.3.2.1 High pregravid BMI
Over-nutrition can lead to a greater than recommended weight gain and high gestational BMI (GBMI). Increased GBMI can lead to maternal hyperinsulinemia, which results in increased nutrients crossing the placenta and the foetus developing hyperinsulinemia and increased foetal mass. This increases the risk of a pregnant woman developing GDM and Gestational Hypertension (GHPT). A large retrospective study on 12 915 pregnant women was conducted by Joy et al (2008) in the USA. The researchers investigated the impact of maternal obesity on birth outcomes and found that obesity increases the risk of pregnant women developing GDM (3.7% and 12% in normal and obese BMI groups respectively, p<0.001), GHPT (9% and 30.9% in normal and obese BMI groups respectively, p<0.001), intervention delivery (36% and 50.4% in the normal and obese groups respectively, p<0.001) and caesarean delivery (22% and 38.2% in the normal and obese groups respectively, p<0.001). These findings were in agreement with both Cruz et al (2007) in a South American study (n=697) and Kruger (2005) in a South African review. High GBMI is also associated
with a longer gestational period, increased caesarean sections and an increase in labour induction.\textsuperscript{3,31,44-46} These maternal morbidities contribute to the increased risk of adverse birth outcomes.\textsuperscript{43}

It was found by Joy et al (2008), that infants born from obese mothers were significantly heavier (3261g and 3354g normal and obese BMI groups respectively p<0.001), more likely to be admitted to intensive care units (5.8% and 8.2% in the normal and obese groups respectively p<0.001) and LGA (6.5% and 12.3% in the normal and obese groups respectively, p<0.001).\textsuperscript{43} Furthermore, several other studies have found that increased weight gain increases the risk of the following: LBW, VLBW, macrosomia, stillbirths, hypoglycaemia of the infant and neonatal resuscitation.\textsuperscript{25-27,31,37,43-45,47,48} A possible explanation for women who gained excess weight and gave birth to small babies, could be that they developed other morbidities, such as vascular complications and hypertension that restricted foetal growth.\textsuperscript{49} It was found however that both groups had the same mean gestational age (38.6 weeks), and there were more stillbirths in the normal group (4) compared to the obese group (1), though this was not statistically significant.\textsuperscript{49}

Underweight women gaining more than the recommended Institute of Medicine (IOM) weight range were at a higher risk of giving birth to a LGA baby than an overweight woman who put on the same amount of weight.\textsuperscript{37} The association between weight gain and LGA is greater than the association between insufficient weight gain and SGA.\textsuperscript{37}

High maternal weight gain is also a risk factor for a woman being overweight in subsequent pregnancies.\textsuperscript{37} Parity is a contributory factor to obesity and if postpartum weight loss is not optimal, BMI correlates with parity.\textsuperscript{4,50} The one positive aspect of increased inter-pregnancy weight gain is that it reduces the risk for delivering SGA infants.\textsuperscript{50}

A large percentage of the black population in South Africa tend to be shorter and overweight than the rest of the population.\textsuperscript{51,52} In the whole of South
Africa, 26.7% of women over the age of 15 in the black African population were found to be overweight and 31.8% were obese.\textsuperscript{51} In the Cape Peninsula these percentages are slightly higher; the percentage of women who are overweight is 36.4% and obese is 34.4%.\textsuperscript{51} It has been found that black women retain more weight postpartum and therefore parity increases the risk of obesity amongst black African women.\textsuperscript{4}

1.3.2.2 Low pregravid BMI
During gestation, the foetus protects its vital organs and during times of starvation, it would rather provide its brain with nutrients, than other organs, such as the kidneys or pancreas.\textsuperscript{53,54} According to the Barker hypothesis, suboptimal intra-uterine growth can lead to poor development of certain organs and this can lead to the development of chronic diseases later in life.\textsuperscript{53,54} These diseases include hypertension, insulin resistance, hypercholesterolemia, and hyperuricemia.\textsuperscript{53,54}

Low pre-pregnancy BMI and under-nutrition can lead to less than recommended weight gain and low GBMI.\textsuperscript{4} Women who are < 45 kg in weight, < 145 cm tall and have a Mid Upper Arm Circumference (MUAC) of < 22 cm are at increased risk for adverse birth outcomes.\textsuperscript{4} They deliver smaller babies, with smaller head circumferences and shorter lengths.\textsuperscript{4,23,31,55} VLBW can be attributed to a low pre-gravid BMI\textsuperscript{48}. Low weight gain is positively correlated with perinatal mortality,\textsuperscript{27} SGA,\textsuperscript{48} LBW,\textsuperscript{4,23,31,44,56} VLBW,\textsuperscript{48} IUGR\textsuperscript{4,23,31} and infant hospitalisation.\textsuperscript{56} If maternal weight gain is less than 0.3-0.4 kg/week, there is an increased risk for preterm labour.\textsuperscript{55} These factors all contribute to an increased risk for infant morbidity and mortality.\textsuperscript{23}

1.3.3 Gestational BMI in a Peri-urban Setting
Transitional nutrition habits have led to more over-nutrition than under-nutrition in the peri-urban areas of South Africa.\textsuperscript{51} Previously HIV/AIDS was associated with an increased risk for losing weight, however it was found in a meta-analysis that with the increased education, urbanisation and use of Anti-Retroviral Drugs (ARV), the proportion of HIV positive women with a low BMI
has decreased. The prevalence of underweight women over the age of 15 in the whole of the South African black African population is low at 4.8%, and is even lower in the Cape Peninsula at 3.7%. It was found that the more urbanised the population, the higher the prevalence of obesity. Puoane et al (2002) established that an increase in income in a peri-urban setting resulted in a more atherogenic diet which was lower in complex carbohydrate and higher in saturated fat. This led to an increase in obesity, and therefore an increase in chronic diseases of lifestyle.

1.4 MATERNAL MORBIDITIES
Maternal morbidities are diseases that arise during pregnancy and often disappear after the infant is born, but increase the risk of the mother developing the disease in a subsequent pregnancy or later in life.

1.4.1 Gestational Diabetes Mellitus (GDM)
GDM is diagnosed when insulin intolerance first arises during the second half of pregnancy. If abnormally high blood glucose occurs during the first trimester, it is more than likely latent Type 2 Diabetes Mellitus (Type II DM). GDM usually abates after birth, although a woman with GDM is more likely to develop Impaired Glucose Tolerance (IGT) and Type II DM later in life and develop GDM in the next pregnancy. Infants born from mothers who have GDM are also at an increased risk for adverse birth outcomes, such as congenital abnormalities, LGA, hyperglycaemia, jaundice and childhood obesity later in life. Furthermore, women with gestational IGT (GIGT) are at more of a risk of giving birth to LGA infants.

The prevalence of GDM worldwide is between 2-19% in high-income countries. In poor to middle income countries, it appears to be in the lower range. Dode and Santos, (2009) found a prevalence of 2.95% in 4123 Brazilian pregnant women. Few studies have looked at GDM in Sub-Saharan Africa, particularly in rural and peri-urban regions of South Africa. One small study (n=262) by Mamabolo et al, (2007) found a low prevalence (1.5% for GDM and 7.3% for GIGT) in the Limpopo province. This was in contrast to the study (n=348) by Huddle, (2005) which found a higher
prevalence (47.5% developed GDM over an 11 year period, average 4.2% per year). High maternal age is one of the most recognised risk factors for developing GDM. The discrepancy between the two studies could possibly be explained in part by this as the average age of Mamabola’s participants was 26.3 (±5.53) and 25.5 (±6.8) respectively compared to the average age of Huddle’s participants (33.9±5.2).

Other risk factors for developing GDM are; ethnicity, genetic predisposition, parity, history of abnormal blood glucose and obesity. Mamabola et al, (2007) disagrees with one of these risk factors as they found that obesity in black African women was not associated with an increased risk for developing GDM or GIGT. This was a smaller study (n=262) and the impact of other risk factors such as age (mean=25.5) and parity (mean=1) was less than most of the other studies. This study was done in only one province in South Africa and the population’s genetic profile could be protecting them from developing GDM or GIGT. Torloni et al, (2006) conducted a systematic review (70 studies) investigating pre-pregnancy BMI as a measure of obesity and the risk of GDM. The risk of developing GDM correlated positively with an increase in pregravid BMI and it was found that for every 1kgm² increase in BMI, the risk of developing GDM increased by 0.92%. It was also found that decreasing BMI by 1kgm² decreases risk of GDM by 1%. The odds ratio of developing GDM were found to be 0.75, 1.97, 3.05 and 5.55 for underweight, overweight, moderately obese, morbidly obese respectively. The strength of the evidence of the systematic review compared to one study is clear and therefore in conclusion, high pregravid BMI is an important risk factor for developing GDM.

Both height and smoking in the first and second trimester seemed to have a protective effect against developing GDM. With regards to height, this is in agreement for Branchtein et al, (2000) (n=5564; Brazilian pregnant women), Jung et al, (1998) (n=9005; Korean pregnant women) and Kousta et al, (2002) (n=833; British pregnant women). The evidence suggests that shorter women (height <1.51m) are found to have lower socio-economic
status and may have been subjected to foetal and/or childhood under-
nutrition. Impaired glucose homeostasis has been associated with shorter
individuals. There are controversial findings with regards to smoking and
reduced risk of developing GDM. Very few studies have looked at
smoking in pregnant women, but there is evidence that smoking is correlated
with a decrease in BMI and therefore a decrease in insulin sensitivity
impairment.

GDM is relatively easy to treat but needs to be detected early. Huddle,
(2005) evaluated a simple but effective specialised diabetic unit (physician,
obstetrician, paediatrician and diabetes nurse educator) for treating GDM in
Soweto. Pregnant women with both GDM and GIGT were examined. The
researchers found that perinatal mortality was significantly less in the
intervention group (3.7%) compared to the control group (15.6%).
Caesarean section was still high at 60% possibly because doctors did not
want the pregnancy to go beyond 38 weeks (Huddle, 2005). They
concluded that a relatively cost-effective intervention was beneficial to
decrease adverse effects of GDM and GIGT. However they also found that
late referrals were a constant problem. In the Western Cape, blood glucose
(96.2%) and urine (97.3%) tests are performed on pregnant women attending
antenatal clinics. It is public policy protocol to refer a pregnant women if her
values are above the normal range (< 5.5 mmol/l fasting and < 8 mmol/l two
hours post-prandially or glucose found in the urine, maternal weight over 120
kg or a previous LGA baby). Unfortunately referral does not always take
place due to the lack of blood glucose testing equipment and therefore GDM
and GIGT pregnancies are not always identified.

As stated before, the main risk factor for developing GDM is obesity and as
this is becoming a major public health problem in South Africa, GDM could be
increasing and placing an increased burden on maternal health in South
Africa. South Africa also has an increased prevalence of T2DM, and this
could be explained by the increase in women developing GDM. Possibilities for the increase in GDM and hence Type II DM could be the rural
urban nutrition transition and IUGR of the mother (when she was a foetus) which programmes the maternal body to have metabolic and endocrine impairment.\textsuperscript{66,81}

Pre-pregnancy BMI is a reliable indicator of obesity during pregnancy and BMI is a better predictor for GDM than weight.\textsuperscript{82} This is ideal for pre-pregnancy counselling, but this is not always appropriate in the peri-urban setting, as most women do not attend clinics until they are in their second trimester of pregnancy. However, counselling and education could be given if a woman is planning future pregnancies and to reduce the risk of developing IGT and T2DM.\textsuperscript{62}

### 1.4.2 Pregnancy Induced Hypertensive Disorders

Pregnancy induced hypertensive disorders (PIHD) include gestational hypertension (GHPT), pre-eclampsia and eclampsia.\textsuperscript{83-85} GHPT is defined as developing hypertension (blood pressure > 140/90 mmHg) or severe GHPT (> 160/110 mmHg) after 20 weeks of pregnancy without proteinuria, whilst pre-eclampsia is defined as hypertension with significant amounts of protein in the urine.\textsuperscript{83-85} Pre-eclampsia could lead to eclampsia (proteinuria with convulsions) which is life-threatening to both the mother and foetus.\textsuperscript{83,84,85}

PIHD affect both maternal and child health.\textsuperscript{86,87} It was found that 15.7\% of maternal deaths were due to complications of PIHD during pregnancy in South Africa.\textsuperscript{83,88} There are differences in the aetiology of GHPT and pre-eclampsia.\textsuperscript{99} Twenty five percent of women in South Africa are reported to have HPT, the prevalence of which is increasing as a result of the increase in obesity.\textsuperscript{90} Black South Africans are particularly at risk due to a genetic susceptibility to low rennin low aldosterone hypertension.\textsuperscript{91,92}

#### 1.4.2.1 Gestational hypertension

Overweight and obese women are at a greater risk of developing GHPT.\textsuperscript{93} It is frequently exposed by pregnancy and the mother often develops hypertension later in life (Silva, 2008).\textsuperscript{94} GHPT is also associated with other
co-morbidities, such as cardiovascular disease and T2DM. Smoking is the only known protective effect against GHPT. It is thought that the combustion of smoke and not the nicotine is the aid in this protective factor. It has also been found that smoking later in the second and third trimester showed more of a protective effect. However due to the other harmful effects of smoking it is not recommended during pregnancy. In the Dutch Generation R study, 3262 pregnant women were categorised according to education levels. Women with low or mid-low education levels were at a higher risk of developing GHPT. Other factors such as substance abuse, pre-existing diabetes, high BMI and hypertension, increased this risk. This could be due to the fact that in high-income countries, women with a lower education level tend to have a higher BMI. The opposite has been found in poor to middle-income countries, where women with a higher education have a higher BMI and are therefore more susceptible to GHPT. The increasing burden of non-communicable diseases in South Africa could be exacerbating GHPT.

1.4.2.2 Pre-eclampsia
The aetiology of pre-eclampsia is uncertain. Pre-eclampsia usually develops in first pregnancies (7-18% compared with 4-9% in subsequent pregnancies). Various thoughts such as placental ischaemia, immune maladaption and genetic predisposition have been implicated. In a study by Conde-Agudelo and Belizan, (2000) looking at 878 680 pregnancies in Latin American and Caribbean women, it was found that the following are risk factors for pre-eclampsia: age over 35 years, single mother, first child, history of hypertension, pre-pregnancy BMI > 26 kg/m², multiple pregnancies, presence of foetal malformations, T2DM. Similarly to GHPT, smoking and low pre-pregnancy BMI (< 19.6 kg/m²) were protective factors. This protective effect is outweighed by the increased risk of having a SGA infant associated with smoking. This is in agreement with other studies. Obesity has the opposite effect when looked at together with smoking. It was found by Ness et al (2008) that obesity obliterated the reduced pre-eclampsia effect of smoking. Therefore suggesting that the protective
effect of smoking occurs as a consequence of diminished appetite.\textsuperscript{77-79} A Cochrane systematic review (12 studies) found that low calcium diets increase the risk for pre-eclampsia and that supplementation can reduce this risk.\textsuperscript{104} Furthermore, the black South African population have been found to have a high prevalence of lactose intolerance and a low dietary calcium intake.\textsuperscript{4,92}

1.4.3 Management of Gestational Hypertensive Disorders

Over half (58.5\%) of maternal deaths are deemed avoidable due to GHPT.\textsuperscript{83,105} Both GHPT and pre-eclampsia increases the risk of caesarean sections, perinatal morbidity, such as IUGR, preterm births, VLBW, SGA, stillbirths and neonatal death.\textsuperscript{105-108} A South African study (n=226) found that 44.7\% of preterm deliveries of VLBW infants was due to PIHD disorders.\textsuperscript{105} The majority of the other adverse events are due to postpartum problems. There are procedures in health care facilities in South Africa that could avoid these morbidities and deaths.\textsuperscript{83} Mothers with PIHD need to be monitored pre- and post pregnancy, equipment needs to be checked and calibrated regularly to avoid under-reading of blood pressure and medication given correctly and adhered to.\textsuperscript{83} Although these recommendations seem to be relatively easy and cost-effective, they are not always implemented optimally in the primary healthcare setting.\textsuperscript{83}

1.5 EXISTING METHODS USED TO PREDICT MATERNAL MORBIDITY AND BIRTH OUTCOMES

1.5.1 Institute of Medicine’s Pregravid BMI and Weight Gain Recommendations

There are various methods of measuring weight gain during pregnancy, examples of these are total weekly rates of weight gain and/or weight gain over a period of a particular trimester.\textsuperscript{3} A universal method of measuring weight gain has not yet been accepted and this has led to different methods being used in different studies and could explain the conflicting results.\textsuperscript{3}
A widely used method was developed by the Institute of Medicine (IOM).\textsuperscript{109} Their recommendations were based on population observation studies and maternal and child health outcomes in the USA (IOM, 2009).\textsuperscript{109} They looked at pregnant women’s pregravid weight, total weight gain and rate of weight gain associated with the best birth outcomes.\textsuperscript{109} They then categorised the recommended rate and total weight gain according to pregravid BMI.\textsuperscript{110} These standards were revised and published in May 2009.\textsuperscript{110} The two main differences in these guidelines are that the pregravid BMI categories have been changed from those based on the Metropolitan Life Insurance tables to those developed by the World Health Organisation (WHO) and the weight gain recommendations for obese women range across a smaller scale.\textsuperscript{110} Women who tended to gain less weight than recommended by the IOM in the black population in the USA were younger, shorter, had a lower pregravid BMI, were less educated and smoked.\textsuperscript{111} It has been found that more women are currently entering pregnancy when they are heavier and older and are gaining too much weight during the pregnancy.\textsuperscript{110} It is recommended that women attain normal BMI before conception and if this is not possible, they should try to adhere to recommended weight gain guidelines.\textsuperscript{110} The IOM guidelines have been criticised as the recommendations are too generous and may result in increased obesity and larger babies.\textsuperscript{112} The guidelines have also been developed for American women only.\textsuperscript{112} Wong et al (2000)\textsuperscript{113} developed their own recommendations for weight gain specifically for the Chinese population as he found their optimal weight gain during pregnancy was significantly different.\textsuperscript{113} Guidelines could be developed for other populations accordingly.

Dietz et al (2009) conducted a study, examining 104 980 pregnant women’s gestational weight gain in the USA.\textsuperscript{37} Thirty eight percent were found to have gained more than the recommended IOM guidelines, 36\% within the range and 26\% below the range.\textsuperscript{37} Similar results were found by May et al (2007) in another smaller American study (n=233).\textsuperscript{49} Sieger-Riz (1994) investigated total weight gain and the rate of weight gain for predicting birth outcomes in 5766 Hispanic women in America.\textsuperscript{109} The pregravid weight was self-reported
and weight was measured at each visit.\textsuperscript{109} Self-reported weight gain has been well correlated with measured weight, except in obese individuals who tend to underreport.\textsuperscript{3} It was found that women with a pre-pregnancy BMI < 19.8 kg/m\textsuperscript{2} had the greatest risk of delivering a preterm baby (relative risk, 1.7).\textsuperscript{109} There was a similar pattern of weight gain in the underweight and normal group of women and between the overweight and obese group of women.\textsuperscript{109} The majority of the former group gained the correct amount of weight, whereas most of the latter gained more than the recommended weight.\textsuperscript{109} They concluded that pre-pregnancy BMI was conclusively indicative of adverse birth outcomes in underweight women only.\textsuperscript{109} Women with poor gestational weight gain for both underweight and overweight groups had an increased risk of giving birth prematurely.\textsuperscript{109} Conversely Murakami et al (2005) suggest that weight gain during pregnancy does not influence pregnancy and birth outcomes and maintained that pre-pregnancy-BMI was a better predictor of outcomes.\textsuperscript{114} These authors argued that rather than looking at total weight gain, the pattern of weight gain should be observed.\textsuperscript{109} It was found that if a woman gained less than 60% of the recommended weight during the third trimester, it would increase the risk of a premature birth.\textsuperscript{109} As previously mentioned, low pre-gravid BMI and inadequate gestational weight gain influences the risk of LBW and VLBW infants.\textsuperscript{48}

There is a lack of research on pregnancy weight gains in South Africa.\textsuperscript{4} Many women in peri-urban areas attend antenatal clinics late in their pregnancy and therefore monitoring weight gain is difficult; gestational age is also uncertain.\textsuperscript{4} Studies looking at pre-pregnancy weight in developing countries therefore tend to rely on self-reporting.\textsuperscript{109} The SADHS (2003) found that the validity of self-reporting depended on the ethnic group and level of education.\textsuperscript{5} Similarly to Kleinman et al,(2007) they found that overweight and obese black African women often underestimated their weight.\textsuperscript{3,51} An inaccurate pregravid BMI can lead to small errors in weight-gain calculations.\textsuperscript{109} This pre-gravid weight needs to correlate with the BMI in the first trimester as the first two-month weight gain has been found to be minimal.\textsuperscript{3,109} Weight gain in the first
trimester reflects the accumulation of maternal fat stores and the weight gained in the third trimester reflects the growth of the foetus.\textsuperscript{110}

Although the IOM method may be the better process for measuring maternal weight gain and predicting adverse birth outcomes and maternal morbidity, it is not always the most appropriate method within a peri-urban setting.

1.5.2 Anthropometry
BMI (weight (kg)/height (m)\textsuperscript{2}) has been used globally as a form of anthropometry for characterising body composition and nutritional status in underweight, normal, overweight and obese individuals.\textsuperscript{48} It is a simple, reliable and low-cost calculation which can be taught easily and utilised by community health workers.\textsuperscript{56} Maternal anthropometry is imperative in predicting pregnancy and birth outcomes and maternal morbidity.\textsuperscript{48,115}

A collaborative meta-analysis was conducted by the WHO ten years ago.\textsuperscript{56} Studies were included if they had looked at the value of anthropometric measurements during pregnancy.\textsuperscript{56} Height, weight, MUAC (pre- or early pregnancy), BMI, weight for gestational age and interval weight gain were assessed.\textsuperscript{56} The following maternal and birth outcomes were examined; delivery mode, postpartum haemorrhage and pre-eclampsia, LBW, IUGR and preterm births (WHO).\textsuperscript{56} There was no advantage in measuring weight at each antenatal visit and it was established that an attained weight taken at 5 (16-20 weeks) or 7 months (24-28 weeks) is the most practical screening tool for LBW and IUGR.\textsuperscript{56} This is important with regards to intervention, since if the mother has been found to have insufficient weight gain at 7 months, it may be insufficient time for nutritional supplementation.\textsuperscript{56} The fact that pre-pregnancy weight is needed could be a problem for if the mother does not attend the antenatal clinic before or during early pregnancy, she will have to recall her weight.\textsuperscript{56} There is a discrepancy as to whether this recalled weight is accurate or not.\textsuperscript{56} The WHO (1995) found that there was a great deal of error whereas other studies have found that there was little difference between recalled and actual weight.\textsuperscript{3,5,56} It was also found that
anthropometric methods have limited prediction for maternal outcomes and preterm births. Neggers and Goldenberg (2003) found the opposite, especially with pregravid BMI being one of the strongest predictors for both IUGR and preterm births. Height was the only weak predictor of a maternal outcome and assisted delivery.

Height and MUAC needed one measurement, as height was static during pregnancy, unless the pregnant mother was under 18 years and MUAC does not change significantly over the duration of 9 months in developing countries. In the WHO review, if studies did not measure heights or weights, MUAC was used to predict LBW and IUGR, but this method did not meet the criteria for prediction. MUAC has usually been used as a measure together with BMI to assess gestational nutritional status. It has been established that MUAC increases with an increase in maternal weight. It has been used as an indicator of pre-pregnancy and early maternal weight in developing countries, where pre-pregnancy weight is usually unknown and estimated. This is however in contradiction to the WHO analysis. There have been different cut-off values (proposed by different authors) indicating nutritional stress when assessing MUAC; < 22 cm, < 23 cm and < 27 cm. It would be a suitable tool to use but MUAC is not routinely measured in the antenatal clinics of South Africa.

In a recent study conducted by Elishbly and Schmalisch (n=1000) regarding Sudanese pregnancy outcomes, all maternal anthropometric measurements (weight, height and MUAC) were positively correlated with the infant’s birth weight, but height was the only measurement that was statistically significant. This is in agreement with Adair and Bisgrove where taller women were found to have a low odds ratio of giving birth to a LBW infant. Picket, (2002) found similar results where height was found to be a predictive factor for birth weight in all ethnic groups of American pregnant women (n=8870), except for the Hispanic population. Maternal height also correlated positively with gestational age. Maternal height of less than 156 cm increased the risk of having a LBW infant by 52%. This is in agreement
with a study by Baqui et al (1994)\textsuperscript{121} who looked at the nutritional status of pregnant women in Bangladesh as well as Santos et al (2008)\textsuperscript{122} although their cut-off value was slightly different at 1.50m.\textsuperscript{121,122} However, Oija and Malla (2007) disagree with these findings in their study on Nepalese women (n=154) as they found that both maternal weight and MUAC showed a significant difference (p<0.05), but both height (p=0.058) and BMI (p=0.280) did not show a significant difference in mothers with normal and LBW babies.\textsuperscript{123} It should be noted though that this was a relatively small sample size, compared to other studies.

1.6 ALTERNATIVE METHODS FOR PREDICTING MATERNAL MORBIDITY AND ADVERSE BIRTH OUTCOMES

1.6.1 Gestational Body Mass Index (GBMI)

A review looking at BMI in developing countries (46 surveys) showed that women with a low BMI during pregnancy were at risk for giving birth to a LBW baby or having a preterm baby and higher neonatal mortality.\textsuperscript{124} Miscarriages and stillbirths were more likely to happen to women with higher BMIs and over 25 years old.\textsuperscript{124} This is in agreement with studies done by Bolzan and Guimarey (2001)\textsuperscript{125} and Thame et al (1997)\textsuperscript{126} where they found that there was a direct correlation between the mother’s BMI and birth weight. Thame et al (1997)\textsuperscript{126} also found a correlation with maternal BMI and infant head circumference.

Cruz et al investigated the BMI of HIV positive South American pregnant women and birth outcomes (n=697).\textsuperscript{23} They used a logarithmic equation developed by the Argentinian Ministry of Health to adjust the BMI for gestational age.\textsuperscript{23} A once-off measurement of BMI at any stage of the pregnancy was used together with specific biochemical parameters, i.e. bicarbonate, Blood Urea Nitrogen (BUN), cholesterol and haemaglobin.\textsuperscript{23} The calculated GBMI was then grouped into categories.\textsuperscript{23} The main findings of this study were similar to those of studies which observed accumulative weight gain and birth outcomes: women who were classified as underweight
gave birth to infants of lower weight, shorter length and smaller head circumference, compared to infants born from mothers in the normal and overweight category. 

Weight is measured in the majority of antenatal clinics in South Africa [Western Cape (97%), SA-urban (97.2%) and SA-non-urban (96.8%)].

Height is measured in the majority of the antenatal clinics in the Western Cape (90.4%). It is still only being measured in two thirds of pregnant women in the non-urban antenatal clinics of South Africa (61.5%). In order for GBMI to be calculated and used, staff should be trained and equipment needs to be installed in the antenatal clinics. This GBMI method is simple and effective and could be used as an alternative for predicting adverse birth outcomes and maternal morbidity in a South African peri-urban setting.

1.6.2 Gestational Risk Score Method

The original gestational risk score was developed by Chamberlain in the 1970s for the British birth survey. He obtained the data from a perinatal mortality study done by Bonham and Butler in 1958. It revealed the accumulative effect of certain risk factors and identified high risk mothers. Socio-economic factors cannot be looked at in isolation as they influence each other. Most of these factors are not quantitatively measurable and therefore the intensity of the effect of a social factor in the above mentioned study was given a numerical score. The scoring system was limited to a few factors, but it was suggested that if the scoring system was used for future studies, a few extra factors should be used. The total score can then be classified into a risk category. It is a simple method to enable it to be used in a practical setting. This system has been used in numerous birth surveys.

Barros then adapted Chamberlain’s scoring system for a developing country in 1980. He found that the majority of the factors and their scores were similar, however he changed social class to family income, added marital
status, removed most of the obstetric history except for previous LBW and took out previous medical history as seen in table 1.2.\textsuperscript{128}
### TABLE 1.2: A comparison of Chamberlain and Barros’s Gestational Risk Scoring classification

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Age</td>
<td>Not given a score</td>
<td>Added a score of 2 for under 20</td>
</tr>
<tr>
<td>Parity</td>
<td>Not given a score</td>
<td>Added a score of 1 for nulliparity</td>
</tr>
<tr>
<td>Social Class</td>
<td>Social class was given a score</td>
<td>Social class was changed to family income and given a similar scoring system</td>
</tr>
<tr>
<td>Previous obstetric performance</td>
<td>Included caesarean section</td>
<td>Caesarean section excluded</td>
</tr>
</tbody>
</table>
| Medical History                     | Included hypertension (140/90 mmHg before 20 weeks gestation) and diabetes.  
                                         Additional scoring to be included if future studies were to be done:  
                                         cardiac disease, chronic respiratory disease, chronic renal disease, endocrine disease | Only included hypertension and diabetes |
| Previous Obstetric history          | Additional scoring to be included if future studies were to be done:  
                                         Antepartum haemorrhage  
                                         Postpartum haemorrhage  
                                         Previous Preterm infant  
                                         Previous LBW infant | Included only previous LBW infant |
| Height                              | Additional scoring to be included if future studies were to be done:  
                                         Height < 157.5cm | Height <150cm |
| Smoking                             | Additional scoring to be included if future studies were to be done:  
                                         > 5 cigarettes per day | Smoking (any amount) |
| Marital status                      | Not included          | Added a score of 2 for single and 0 for with partner |

When using this Gestational Risk Score (GRS), Santos et al (2008) found that the perinatal mortality rate was 13/1000 and 54/1000 for the low and high risk groups respectively.122 The investigators also found that women in the high risk category were less likely to attend antenatal clinics than the women in the low risk category.122 Doctors gave more attention to the women in the high risk group (69.7% compared to 56.6% in the low risk group) and caesarean sections were performed more for the high risk group, (33.2% compared to 26.8%) than for the low risk group.122,128 No scoring system is completely
unbiased, but it should be used as a preventative method to decrease maternal and perinatal risk.

This scoring system has also been used in the study by Santos et al (2008). They looked at the comparison of three cohorts (1982 n=6011, 1993 n=5304, 2004 n=4287) in Southern Brazil. There was a trend for women in the higher age group to be in the higher income group. There was an increase in the number of mothers in the extreme age groups, <20 and >34 years of age. A reduction in smoking was found from 35.6% to 25.1% in 1982 and 2004 respectively. The reduction in smoking was greater in women with a higher income. The number of women who were <150cm reduced between 1982 and 1993, but increased in 2004. The pregnant women in the 2004 cohort were significantly heavier across all income groups. The mean BMI went from 22.7 to 22.8 and eventually to 24.2kg/m² in 1982, 1993 and 2004 respectively. Mothers also gained an average of 600-800g more than the original cohort. There was also a significant increase in obesity from 4.4% in 1982 to 10.7% in 2004. Parity decreased from 1.3 to 1.1, this was seen more in higher income families. The mean birth interval increased from 2 years to 5 years. High risk pregnancies were highest among low income families. The prevalence of a caesarian section was three times more in 2004 than in 1982 as more high risk pregnancies were identified.

The main findings of these studies were that social inequalities had a negative impact on maternal health. The GRS has not been used in South Africa. It is another alternative simple yet effective tool that could be used in the antenatal clinics to identify pregnant women who are at risk.

1.7 INFLUENCE OF SOCIO-ECONOMIC STATUS ON GBMI AND MATERNAL MORBIDITY DURING PREGNANCY

In the Western Cape, Khayelitsha is one of the fastest expanding peri-urban areas. It was formally recognised and classified as a peri-urban setting in
1983 and has a mixture of formal and informal housing structures.\textsuperscript{17,122} The health status of women in peri-urban areas is influenced by the South African political transition, increased urbanisation and the awareness of the importance of healthcare for maternal and child health.\textsuperscript{7,17} Urbanisation is a determinant of health and can be positive if it increases the access to health care facilities, but it also gives rise to poverty, especially in South Africa.\textsuperscript{7,17,130,131} The negative effects of urbanisation are highest among pregnant women.\textsuperscript{7,17} Politics and race have also been South Africa’s social determinants of health and the government still needs to reduce health inequalities to improve maternal and child health for the benefit of all in South Africa.\textsuperscript{13}

The transition from a rural to an urban setting alters an individual’s SES and has a major impact on their health.\textsuperscript{7,9,130} Women, especially pregnant women, are one of the most vulnerable groups during this transition.\textsuperscript{7,130} Maternal mortality is still too high in South Africa and it is therefore important to look at SES and the influence it has on pregnancies.\textsuperscript{26} Risk factors can then be established and pregnant women in these higher risk groups can be identified and given additional antenatal appointments.\textsuperscript{26} Priority can also be given to these high risk pregnant women during labour.\textsuperscript{5} Presently 39.1\% of women’s deliveries are conducted by a doctor in the Western Cape, but only 22.5\% of these are performed on black African women.\textsuperscript{5}

As previously mentioned, most of the studies investigating the impact of SEV on health have not been done in the black African population and there are very few studies that have looked specifically at pregnant black South African women.\textsuperscript{17,132} The SADHS (2003) looked at SEV in the whole of the South African population, but not the impact on health status.\textsuperscript{5} Whereas, although Malhotra et al (2008) investigated SEV specifically in the black African population in the Western Cape, the focus was on obesity.\textsuperscript{9}

The main study that has looked at socio-economic inequalities as a predictor of health is the Yenza cross-sectional study.\textsuperscript{132} They interviewed 12 049 men
and women in two deprived areas in the Eastern Cape. One of the areas was mostly rural and the other peri-urban.\textsuperscript{132} It was established that the main determinants of health in a South African peri-urban setting included education, access to electricity and refuse disposal. Education and basic services needs to improve to help reduce health inequalities and improve the impact on health.\textsuperscript{132}

1.7.1 Education and Employment

In high-income countries such as the Netherlands and the United Kingdom, it has been found that women with a lower education level and unemployed, had a higher BMI and therefore were at a greater risk of developing co-morbidities such as GHPT and GDM.\textsuperscript{94,133} This is dissimilar to what has been found in low to middle-income countries. Brazilian pregnant women who were more educated had a significantly higher pre-pregnancy-, gestational- and post-pregnancy BMI.\textsuperscript{122} They also gained more weight during the pregnancy when compared to women who were less educated.\textsuperscript{122} In Brazil, it was found that a larger proportion of women who were employed had a higher BMI and a higher proportion of unemployed women were underweight.\textsuperscript{23} These findings were in agreement with Banda’s et al (2007)\textsuperscript{44} Zambian study, and Bourne et al (2002)\textsuperscript{90} and Malhotra et al (2008)\textsuperscript{9} who investigated the black population of South Africa (n=983, both men and women). Urbanisation affects educational status and it was found that newer arrivals to the peri-urban area had lower educational status, more informal housing and a lower atherogenic diet, which contributed to a lower BMI.\textsuperscript{51} Bourne et al (2002)\textsuperscript{90} also established that women who were more urbanised, had a higher level of education, more formal housing and ate a more westernised diet; tended to have a higher BMI compared with those with little or no schooling.\textsuperscript{90} Whereas Malhotra et al (2008)\textsuperscript{9} found that married women had a higher BMI. The Yenza study had similar findings to Bourne et al (2002)\textsuperscript{90} and established that higher education level and employment correlated with increase in BMI.\textsuperscript{132} This increase in BMI correlated with an increase in hypertension and both were associated with a higher monthly income.\textsuperscript{132}
A household survey was done by Hoffman et al (1997) (n=661) in Khayelitsha. With regards to schooling, 7% had no schooling, 38.7% had basic literacy (less than 7 years schooling) and 54.3% had secondary schooling. The SADHS found that in the Western Cape (urban and non-urban and all ethnic races), 1.7% of women had no education, 54% completed between grades 8-11, 23% had completed Grade 12 and 6.7% had tertiary education. People who lived in urban areas were three times more likely to have tertiary education and younger people were found to have higher education levels. With regards to employment, Hoffman et al (1997) found that 54.6% of women were employed. The main forms of employment were domestic service and trading/hawking. The Western Cape’s percentage of employment was considerably higher than the rest of the country (55% compared to 36%), but this again was across all ethnic races. The SADHS had similar findings to Hoffman et al (1997) and found that the main type of work was domestic services and self-employed trading.

An increase in urbanisation has led to an increase in SES and more affluence. This has resulted in people having less time to prepare more healthy meals. A more ‘western’ diet which was lower in carbohydrate and higher in fat has been adopted. This has led to an increase in obesity, and therefore an increase in chronic diseases of lifestyle.

The prevalence of hypertension was 2.2% and diabetes was 0.5% in Hoffman’s study. There was a higher prevalence of chronic diseases in higher educated and more urbanised women. Employment status however was not associated with chronic illness.

1.7.2 Age and Parity
In the SADHS, it was established that older women had a higher BMI. This is in agreement with other studies, particularly the Yenza study where age correlated with increasing BMI and increasing blood pressure. High maternal age is also one of the most recognised risk factors for developing GDM.
Women who have had more children previously are more likely to have an increased BMI than nulliparous women.\textsuperscript{135} Banda et al (2007) found in their study on pregnant Zambian women (n=1211) that women with the higher GBMI were older, and had higher parity.\textsuperscript{44} Parity has decreased significantly in Brazil from 1.3 (1982) to 1.1 (2004) and the interval between births increased from 33.5 months (1982) to 65.7 months (2004).\textsuperscript{122} In the South African setting, parity has also decreased from 2.9 (2001) to 2.5 (2007).\textsuperscript{6} This decrease has also been seen in the black African population from 3.2 (2001) to 2.75 (2007).\textsuperscript{6} Women in the formal housing area were less likely to have more than five children compared to the shack area.\textsuperscript{130} This reduction is thought to be due to socio-economic factors such as increased economic growth, urbanisation, social mobility and the education of women with regards to family planning.\textsuperscript{6} It should then follow that if parity is reduced, obesity should also reduce, but as stated before, black African women retain more weight postpartum and this outweighs the effect of reduced parity.\textsuperscript{4} With an increase in age and parity associated with an increase in BMI, it follows that there is an increased risk of developing GHPT and GDM.\textsuperscript{17}

1.7.3 Height

Various studies conducted in this peri-urban setting have found the average height of women in Khayelitsha to be approximately 1.59 m.\textsuperscript{5,51} Other studies have shown that height has a positive association with GBMI: Branchtein et al (2000)\textsuperscript{73} examined 5564 Brazilian pregnant women, Jung et al (1998)\textsuperscript{74}; 9005 Korean pregnant women and Kousta et al (2002)\textsuperscript{75} 833 British pregnant women). As previously mentioned, women who have had a socially deprived upbringing, tend to be shorter.\textsuperscript{73,74} Furthermore, their smaller stature has a positive association with developing glucose intolerance, especially during pregnancy.\textsuperscript{65,73,74}

1.7.4 Housing and Services

The Yenza study established that access to electricity, clean water and refuse disposal are good predictors of the health of a peri-urban population.\textsuperscript{132}
Almost 60% (59.5%) of the houses were structurally adequate, 39% had access to clean water, 25.6% had access to gas or electricity and 21.6% had a refrigerator. These results differ from Hoffman et al (1997), who found that 13.7% lived in formal housing settlements, 54.6% lived in informal housing, but the area was serviced and 31% lived in settlements without water or sanitation. One of the reasons for the discrepancy could be that Hoffman’s study was conducted before 1994 (1990) and the Yenza study (1999) after 1994 where there was a change in government and health policies. Secondly the Yenza study was looking at both men and women, whereas Hoffman et all only looked at women. Thirdly a rapid increase of urbanisation has occurred in the Khayelitsha area which has lead to an increase in informal settlements whereas individuals in the Eastern Cape have lived there for longer and are more established.

The SADHS (2003) found that there was an increase of 12% in electricity users since 1998 and 77% of South Africans had access to electricity. Yet, there is still a significant difference between urban and non-urban access. There has been a general decrease in the use of other fuels for cooking and 76% of South Africans now use electricity as a cooking source. High BMI and high blood pressure were associated with having electricity and a higher monthly income.

With regards to water, 41.2% had water piped into their dwelling, 25% had water piped into their yard and 19.3% used a public tap (SADHS, 2003). The number of dwellings and yards that have piped water has increased. The number of flush toilets (75%) connected to sewerage has not changed much since 1998. Six percent have flush toilets connected to septic tanks. Seventy percent of the non-urban population use a pit latrine, whilst 8% have no sanitation. South African sanitation services needs improvement as it is vital for the improvement of health.

The length of urbanisation seems to affect housing status. People who have been in the peri-urban area for longer have more formal housing
compared to those who have newly arrived. In Cooper et al’s (1991) study looking at women’s health in Khayelitsha (n=3229), it was found that there was a significant difference (p<0.001) between chronic illnesses in the formal area (5.8%) compared to the shack area (1.6%). The prevalence of HPT was 2.7% and 0.2% in formal and shack area respectively (p<0.001) and diabetes was 2% and 0.6% in formal and shack area respectively (p<0.001)(Cooper, 1991).

1.7.5 Smoking
Smoking may inhibit maternal weight gain. In the Yenza study, 6% of women were smokers. This is slightly lower to the findings of Steyn et al (1997) who conducted a survey in public antenatal clinics in four different South African cities. They interviewed 394 pregnant women with regards to smoking and found that only 4% of black African women smoked compared to 47% of coloured women. Overall 90% of the pregnant women knew that it was unhealthy to smoke. Low education, increasing age, inadequate housing, lack of electricity, no refrigerator, lack of access to clean water, inadequate toilet facilities, inadequate refuse disposal and being male were in general predictive factors for being a smoker. Women with these social-inequalities have lower BMI and therefore cigarette smoking is contributing to this lower BMI.

Dode and Santos (2009) found that smoking in the first and second trimester seemed to have a protective effect against developing GDM. There are controversial findings with regards to this. As mentioned previously, for ethical reasons, few studies have looked at smoking during gestation. However, the studies that have been conducted have found an association with smoking and decreased BMI. This lower BMI has had a positive effet on insulin sensitivity.

1.7.6 Marital Status
Marital statistics are difficult to compare as studies categorise marital status in different ways and there are large cultural and religious diversity in South
Africa. In South Africa, the customary marriage act came into place in 1998 where traditional African marriages were recognised as valid. In Hoffman et al’s (1997) household survey, 60.2% were married, 28.4% were single and 11.3% were widowed/separated or divorced. These statistics are vastly different from the SADHS (2003) and Mahlotora (2008) and could be explained by previously mentioned factors. The survey also took into account the whole of South Africa. The survey found that 54.3% of women had never married, which was an increase from 48% in 1998 and 27.9% of women had married, which was a decrease from 33.7% in. Approximately ten percent of the population were found to be living with their partner but not married.

Malhotra (2008) found an association with marriage and GBMI. This is in disagreement with Hoffman. It was however found that chronic illnesses did not seem to be associated with marital status. The increase in BMI could have an influence on increasing these maternal morbidities in the future.

### 1.7.7 Socioeconomic Variables (SEV)
Examining SEV explains the impact of social structures on the individual. The knowledge and the establishment of the influence of SEV can assist in the prevention of adverse birth outcomes and the development of maternal morbidities. Social inequalities dominate the peri-urban population and the relationship between SEV and birth outcomes and maternal morbidity needs to be determined. As previously mentioned, the awareness of the effect of various SEV on pregnant women can aid in the development of strategic maternal health policies.

### 1.8 CONCLUSIONS AND RATIONAL FOR THE STUDY
To conclude, there are controversial findings as to which method is the most appropriate for predicting adverse birth outcomes and maternal morbidity. Women need to be educated to visit their ante-natal clinics as soon as they suspect or establish that they are pregnant. However, an alternative once-off method needs to be established as the first antenatal visit often occurs late in
the gestational period in the African, and also South African setting and weight gain over the pregnancy cannot therefore be used as a prediction method. Appropriate medical and nutritional advice can then be given to the pregnant woman to improve their outcomes.

SEV have been looked at in relation to health status in the coloured community of the Western Cape and black African population. There are however few studies that have looked at the influence of SEV in a group of pregnant women. There is therefore a need for a study to be conducted in this population. Social inequalities dominate this group and the relationship between SEV and birth outcomes and maternal morbidity needs to be determined. The understanding of the influence of specific SEV is important for the development of public health policy in this field.\textsuperscript{15}
CHAPTER 2
METHODOLOGY
2.1 AIMS AND OBJECTIVES OF THE STUDY

2.1.1 Aims

The aims of this study were:

1. To investigate the strength of the GBMI and GRS methods for predicting birth outcomes and maternal morbidity.

2. To investigate the relationships between socio-economic variables, GBMI and maternal morbidities in Khayelitsha, South Africa.

2.1.2 Specific Objectives

The specific objectives of the study were:

1. To describe the following for the first 103 pregnant participants (intervention group only) of the Philani Mentor Mothers’ Project (PMMP) in Khayelitsha, South Africa:
   - Pre-pregnancy BMI and gestational weight gain
   - Gestational BMI (GBMI)
   - Gestational Risk Score (GRS)

2. To describe the following for the first 205 pregnant participants (intervention and control groups) of the Philani Mentor Mothers’ Project (PMMP) in Khayelitsha, South Africa:
   - Socio-economic variables
   - GBMI
   - Maternal Morbidities: Gestational Diabetes and Hypertension

3. To investigate if there is a significant difference between:
   Prediction of birth outcomes and maternal morbidity between three prediction methods, namely: pregravid BMI and maternal weight gain, gestational BMI and GRS
4. To investigate the prediction strength of pregravid BMI and maternal weight gain, gestational BMI and GRS

5. To investigate the relationship between:
   - Socioeconomic variables and Gestational BMI
   - Socioeconomic variables and maternal morbidities

2.2 HYPOTHESES

- There is no significant difference between the three different prediction methods.
- Prediction methods accurately predict birth outcomes and maternal morbidities.
- There is a correlation between socioeconomic variables and gestational BMI.
- There is a correlation between socioeconomic variables and maternal morbidities.

2.3 OPERATIONALIZATION

This was a sub-study of the Philani Mentor Mothers’ Study (PMMS) (Figure 2.1). The author of this sub-study was the research and administrative coordinator for the intervention part of the research team for PMMS. The author was involved in developing and implementing the PMMS. In the PMMS twenty-six matched neighbourhoods were identified in the township; Khayelitsha, Western Cape, South Africa. Thirteen of these were assigned as intervention neighbourhoods and the other thirteen were controls. Pregnant women were recruited from these neighbourhoods by a group of trained recruiters. The intervention was conducted by the Philani Nutrition Centres Trust. Mentor mothers were trained by Philani and assigned to an intervention neighbourhood (preferably near to where they live so that they are familiar with the community). Pregnant women in the intervention areas received between four to six antenatal visits and six to eight postnatal visits from the
mentor mothers. Two extra visits were scheduled ante- and postnatally if the pregnant women had more than two of the following risk factors: HIV positive, Tuberculosis (TB), drinking during and after pregnancy and a previous LBW baby. Antenatal topics discussed included the following: maternal health, nutrition, alcohol, smoking, HIV, TB and preparing for delivery. Postnatal topics discussed included the following: maternal and child health, infant feeding, hygiene, protection of child, mother care, danger signs, alcohol use, growth monitoring, TB, HIV, immunizations and complementary feeding.

**FIGURE 2.1:** Diagrammatical representation of the Philani Mentor Mothers’ Study

The interviews and assessments were organised and conducted by Department of Psychology, Stellenbosch University. Trained assessment interviewers administered the questionnaires to participants and infants at the following points:

- Antenatal baseline assessment upon identification of pregnancy and recruitment to study (baseline questionnaire)
- One week after birth (birth questionnaire)
- Six months after birth
- Eighteen months after birth
This sub-study used data from the questionnaires done at baseline and one week after birth. Figures 2.2 and 2.3 are diagrammatical representations of specific objectives 1 and 2 respectively. Relevant questions that were used in this sub-study have been listed in the two questionnaires: baseline [English (Appendix A) and Xhosa (Appendix B)] and birth [(English (Appendix D) and Xhosa (Appendix E))] assessments. Weight gain was obtained from the folders that the Mentor Mothers filled in at each antenatal visit.

First 103 Mother to Be (MtB) (Intervention Group only)

- Weight and height was recorded at the assessment centre during the baseline questionnaire
- Gestational BMI (GBMI) was calculated and categorised

Second 103 Mother to Be (MtB) (Control Group)

- Weight was recorded at each MM visit
- Weight gain was categorised

Socio-economic variables were obtained at the assessment centre during baseline questionnaire

- Gestational Risk Score was calculated and categorised

Birth outcomes and maternal morbidity was obtained for each MtB at the birth questionnaire. It was ascertained if one, two or all three methods were adequate at predicting these outcomes.

**FIGURE 2.2:** Diagrammatical representation of the specific objective 1
First 205 Mtb (Intervention and Control groups)

Gestational BMI was calculated from baseline questionnaire

What was the relationship between GBMI and SEV?

Socio economic variables (SEV) were obtained from baseline questionnaire

Maternal morbidities were obtained from birth questionnaire

What was the relationship between maternal morbidities and SEV?

FIGURE 2.3: Diagrammatical representation of the specific objective 2

2.4 STUDY DESIGN

2.4.1 Study Domain

The study domain was quantitative.

2.4.2 Study Design

This was a prospective follow-up sub-study as part of a randomised controlled study.

2.5 POPULATION AND SAMPLING FOR THE STUDY

This study was a sub-study of the PMMS. Participants were recruited as part of the bigger PMMS (n=600; 300 in intervention group and 300 in control group), and data was used for this sub-study as follows:
2.5.1 Sample Selection

2.5.1.1 Sample selection for prediction methods
The first consecutive 103 pregnant women in the intervention group of the PMMS were selected. Their information was used to analyse the strength of the prediction methods.

2.5.1.2 Sample selection for SEV
The first consecutive 205 pregnant women in both the intervention and control groups of the PMMS were selected. Their information was used to evaluate and correlate the SEV and GBMI and correlate the SEV and maternal morbidity.

2.5.2 Sample Size

2.5.2.1 Sample size for prediction methods
A sample size of 103 was calculated providing an effect size of 0.25 with a power goal of 0.9 for specific objectives.

2.5.2.2 Sample Size for SEV
A sample size of 102 from the intervention group and 103 from the control group provided an effect size between 0.25 and 0.4 with a power goal of 0.9.

2.6 SELECTION CRITERIA

2.6.1 Criteria for Inclusion
Participants were included in the PMMS if the following inclusion criteria were met (a sub-sample of these participants was used for the current sub-study):

- Age 18 or over
- Pregnant
• Living in a study neighbourhood for the duration of the study
• Ability to give informed consent as judged by assessment interviewer
• No psychosis, neurological damage, inability to communicate with interviewer, delusional or hallucinating, as judged by an interviewer with consultation with an assessment co-ordinator.

2.7 DATA COLLECTION TOOLS

2.7.1 Questionnaires
Questionnaires were developed by the PMMS research team. Each questionnaire as a whole was not validated for the specific population, but when looking at various likert scales, they had been previously validated. The questionnaires were translated into Xhosa and translated back into English for quality assurance. Questionnaires were delivered in Xhosa as this was the first language of all the participants. The questionnaires were installed onto specific mobile phones. Assessment interviewers were trained to input the data onto the mobile phone during the interviews. This information was then uploaded onto a central consol system (developed by Clyral mobile research company) and the information was analysed.¹⁴¹

2.7.2 Anthropometric Measurements
Maternal weight, maternal height, birth weight, birth length and birth head circumference was used to determine maternal weight gain, GBMI and birth outcomes.

2.8 QUALITY OF DATA COLLECTED

2.8.1 Questionnaires
The quality of data was checked for each interview by the PMMS assessment data-coordinator. A random selection of interviews was cross checked by an external quality controller.
2.8.2 Anthropometric measurements
The researcher attained quality assurance by doing weekly spot checks on the mentor mothers and data collectors and holding regular revision workshops.

2.9 METHODS OF DATA COLLECTION

2.9.1 Anthropometric Measurements
Data collectors and mentor mothers attended a training workshop on obtaining anthropometric measurements. This training workshop was organised and held and executed by the researcher. To improve reliability, both data collectors and mentor mothers were asked to take all measurements three times and to record the average.

2.9.2 Pregravid BMI
Pregravid weight was recalled by participants. Pregravid BMI was calculated using the equation (weight/(height)^2). Pregravid BMI was then categorised according to the IOM categories seen in table 2.1.

2.9.3 Gestational Weight Gain
Weight was measured using a calibrated Precision Health Scale Model UC321. The scale was placed on a flat surface to ensure an accurate reading. Add-on feet were used if the surface was uneven. The weight was measured to the nearest 0.1kg. Time of day and clothing can alter the validation of the weight taken, but unfortunately time of day could not be controlled for. The anthropometric measurements were completed in a private office at the PMMS assessment centre (Scott Street, Khayelitsha) by the data collector (height and weight) or in the pregnant woman’s home by the mentor mother (weight). Weight was measured at each of the four antenatal visits. Weight gain was then classified according to the IOM standards (table 2.1).
TABLE 2.1: IOM’s guide to gestational weight gain based on pre-pregnancy BMI

<table>
<thead>
<tr>
<th>Pregravid BMI</th>
<th>BMI (kg/m²) WHO</th>
<th>Recommended total weight gain (in kg) for total pregnancy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Underweight</td>
<td>&lt;18.5</td>
<td>12.7-18.1</td>
</tr>
<tr>
<td>Normal weight</td>
<td>18.5-24.9</td>
<td>11.4-15.9</td>
</tr>
<tr>
<td>Overweight</td>
<td>25.0-29.9</td>
<td>6.8-11.4</td>
</tr>
<tr>
<td>Obese (includes all classes)</td>
<td>&gt;30</td>
<td>6.8</td>
</tr>
</tbody>
</table>

2.9.4 Gestational BMI

Weight was collected as described in section 2.11.2. Height was measured using a calibrated stationary stadiometer (model-MM5) during the baseline questionnaire. Height was recorded to the nearest 0.001m. Participants were asked to remove their shoes, socks and any head-gear. BMI was calculated accordingly to the equation (weight/(height)²). Gestational BMI was calculated using the equation for adjusted BMI for self-reported gestational age (using the last menstrual cycle method) using the GBMI equation (table 2.2) and categorised (table 2.3).

TABLE 2.2: Derivation of Gestational Body Mass Index (BMI) corrected for gestational age [GBMI]

<table>
<thead>
<tr>
<th>Gestational age</th>
<th>GBMI</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 16</td>
<td>([weight - 2] ÷ (height²)) multiplied by 10000</td>
</tr>
<tr>
<td>≥ 16 to &lt; 21</td>
<td>([weight - 4] ÷ (height²)) multiplied by 10000</td>
</tr>
<tr>
<td>≥ 21 to &lt; 25</td>
<td>([weight - 5.5] ÷ (height²)) multiplied by 10000</td>
</tr>
<tr>
<td>≥ 25 to &lt; 29</td>
<td>([weight - 7] ÷ (height²)) multiplied by 10000</td>
</tr>
<tr>
<td>≥ 29 to &lt; 33</td>
<td>([weight - 8.5] ÷ (height²)) multiplied by 10000</td>
</tr>
<tr>
<td>≥ 33 to &lt; 37</td>
<td>([weight - 10] ÷ (height²)) multiplied by 10000</td>
</tr>
<tr>
<td>≥ 37</td>
<td>([weight - 11] ÷ (height²)) multiplied by 10000</td>
</tr>
</tbody>
</table>
TABLE 2.3: Use of GBMI in defining maternal nutritional status (MNUT).\textsuperscript{122}

<table>
<thead>
<tr>
<th>GBMI</th>
<th>MNUT</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 10</td>
<td>Value low (out of computable range)</td>
</tr>
<tr>
<td>[10 \text{ to &lt; 19.8} ]</td>
<td>Underweight</td>
</tr>
<tr>
<td>[19.8 \text{ to &lt; 26.1} ]</td>
<td>Normal</td>
</tr>
<tr>
<td>[26.1 \text{ to &lt; 29} ]</td>
<td>Overweight</td>
</tr>
<tr>
<td>[29 \text{ to &lt; 50} ]</td>
<td>Obese</td>
</tr>
<tr>
<td>[50 ]</td>
<td>Value high (out of computable range)</td>
</tr>
</tbody>
</table>

2.9.5 Gestational Risk Score

The data in table 2.4 was obtained from the baseline questionnaire and used to calculate the gestational risk score. The score was then categorised into one of the following categories low risk (score of 0-2), intermediate risk (score of 3-7) or high risk (score of >8).
### TABLE 2.4: Adapted gestational risk score

<table>
<thead>
<tr>
<th>Demographic Characteristic</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td></td>
</tr>
<tr>
<td>Under 20 years</td>
<td>2</td>
</tr>
<tr>
<td>20-29 years</td>
<td>0</td>
</tr>
<tr>
<td>30-34 years</td>
<td>1</td>
</tr>
<tr>
<td>Over 35 years</td>
<td>2</td>
</tr>
<tr>
<td><strong>Parity</strong></td>
<td></td>
</tr>
<tr>
<td>No children</td>
<td>1</td>
</tr>
<tr>
<td>1-2 children</td>
<td>0</td>
</tr>
<tr>
<td>3 children</td>
<td>1</td>
</tr>
<tr>
<td>4 or more children</td>
<td>2</td>
</tr>
<tr>
<td><strong>History of</strong></td>
<td></td>
</tr>
<tr>
<td>Abortion</td>
<td>4</td>
</tr>
<tr>
<td>Stillbirth</td>
<td>4</td>
</tr>
<tr>
<td>Neonatal death</td>
<td>4</td>
</tr>
<tr>
<td>Previous low birth weight baby</td>
<td>2</td>
</tr>
<tr>
<td><strong>Family income</strong></td>
<td></td>
</tr>
<tr>
<td>Under 3 time the monthly minimum wage</td>
<td>2</td>
</tr>
<tr>
<td>3.1-6 times the monthly minimum wage</td>
<td>1</td>
</tr>
<tr>
<td>More than 6 times the monthly minimum wage</td>
<td>0</td>
</tr>
<tr>
<td><strong>Previous morbidity of mother</strong></td>
<td></td>
</tr>
<tr>
<td>Diabetes</td>
<td>4</td>
</tr>
<tr>
<td>Hypertension</td>
<td>4</td>
</tr>
<tr>
<td><strong>Nutritional status</strong></td>
<td></td>
</tr>
<tr>
<td>Mother’s height</td>
<td></td>
</tr>
<tr>
<td>&lt;150cm</td>
<td>0</td>
</tr>
<tr>
<td><strong>Lifestyle</strong></td>
<td></td>
</tr>
<tr>
<td>Smoking</td>
<td>1</td>
</tr>
<tr>
<td><strong>Marital status</strong></td>
<td></td>
</tr>
<tr>
<td>With partner</td>
<td>0</td>
</tr>
<tr>
<td>Without partner</td>
<td>2</td>
</tr>
<tr>
<td><strong>Gestational risk</strong></td>
<td></td>
</tr>
<tr>
<td>Low risk</td>
<td>0-2</td>
</tr>
<tr>
<td>Intermediate risk</td>
<td>3-7</td>
</tr>
<tr>
<td>High risk</td>
<td>&gt;8</td>
</tr>
</tbody>
</table>
2.9.6 Birth Outcomes

The following birth outcomes were obtained from the clinic card (filled out in the maternal obstetric unit) at the birth questionnaire:

- **Weight**
  - LBW = < 2500 grams
  - VLBW = <1500 grams
  - SGA = mass < than 10th percentile for gestational age.
  - LGA = mass > 90th percentile for gestational age.
  - Gestational age (normal between 38-42 weeks)
  - Macrosomic >4000 grams
- **Length**
  - Large length for age = length >90th percentile for gestational age.
  - Small length for age = length < 10th percentile for gestational age.
- **Head circumference (HC)**
  - Large HC for age = HC >90th percentile for gestational age.
  - Small HC for age = HC < 10th percentile for gestational age.
- Miscarriages
- Stillbirths
- Neonatal deaths
- Maternal deaths

2.9.7 Maternal Morbidity

The following development of the following maternal morbidities were obtained during the birth questionnaire:

- Gestational diabetes
- Gestational hypertension

2.9.8 Socioeconomic Variables (SEV)

The SEVs in table 2.5 were obtained during the baseline questionnaire.
TABLE 2.5: Socioeconomic variables investigated

<table>
<thead>
<tr>
<th>Socioeconomic variables</th>
<th>Socioeconomic variables</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Age</td>
<td>• Education level</td>
</tr>
<tr>
<td>• Height</td>
<td>• Employment status</td>
</tr>
<tr>
<td>• ID book</td>
<td>• Source of income for household</td>
</tr>
<tr>
<td>• Home language</td>
<td>• Household monthly income</td>
</tr>
<tr>
<td>• Marital Status</td>
<td>• Number of people living in household</td>
</tr>
<tr>
<td>• Smoking</td>
<td>• Housing description</td>
</tr>
<tr>
<td>• Total number of pregnancies (pariety)</td>
<td>• Water source</td>
</tr>
<tr>
<td>• Number of live births</td>
<td>• Household toilet</td>
</tr>
<tr>
<td>• Attempt to terminate pregnancies</td>
<td>• Electricity</td>
</tr>
<tr>
<td>• Previous low birth weight babies</td>
<td>• Cooking fuel</td>
</tr>
<tr>
<td>• HIV status</td>
<td>• Household items e.g. telephone</td>
</tr>
<tr>
<td>• TB status</td>
<td></td>
</tr>
</tbody>
</table>

2.10 STATISTICAL METHODS

MS Excel was used to capture the data and STATISTICA version 9 (StatSoft Inc. (2009) STATISTICA (data analysis software system), (www.statsoft.com.) was used to analyse the data.

Summary statistics was used to describe the variables. Distributions of variables were presented with histograms and/or frequency tables. Medians or means were used as the measures of central location for ordinal and continuous responses and standard deviations and quartiles as indicators of spread.

Relationships between two continuous variables were analysed with regression analysis and the strength of the relationship measured with the Pearson correlation or Spearman correlation if the continuous variables were not normally distributed. If one continuous response variable was related to
several other continuous input variables, multiple regression analysis was 
used and the strength of the relationship measured with multiple correlation.

The relationships between continuous response variables and nominal input 
variables were analysed using appropriate analysis of variance (ANOVA). 
Specifically an ANOVA was used to examine whether or not there was a 
significant difference among the three prediction methods and birth outcomes 
and maternal morbidity.

When ordinal response variables were compared versus a nominal input 
variable, non-parametric ANOVA methods were used. For completely 
randomized designs the Mann-Whitney test or the Kruskal-Wallis test was 
used and for repeated measures the Wilcoxon- or Friedman tests was used.

The relation between nominal variables was investigated with contingency 
tables and likelihood ratio chi-square tests.

A p-value of $p < 0.05$ represented statistical significance in hypothesis testing 
and 95% confidence intervals were used to describe the estimation of 
unknown parameters.

2.11 ETHICS CONSIDERATIONS

2.11.1 Ethics Review Committee
Ethics approval for the Mentor Mothers’ Project was obtained from both 
Stellenbosch University (NO8/08/218) and UCLA (NOG07-02-033). A 
research protocol for this sub-study was submitted to and approved by the 
Health Research Ethics Committee, Faculty of Health Sciences, Stellenbosch 
University, South Africa.

2.11.2 Informed Consent
Participation was voluntary and participants could opt out at any stage of the 
study. Each participant was given an informed consent form to sign by the
assessment interviewer. The consent form content and all aspects of the study were explained to the participant in Xhosa. A copy of the consent form is attached. (Appendix G (English version) and H (Xhosa version)).

2.11.3 Participant’s Confidentiality
Each participant was given a personal identity number (PID) and ensured that their information would be treated confidentially. The pregnant women who were in the intervention group had a folder opened for them. This had both their name and PID number. These folders were handed out at the beginning of the day and collected at the end of the day and kept in a locked filing cabinet at the Philani Nutrition Centre.

2.12 FUNDING
The cost of the sub-study was covered by the PMMS. The PMMS received funding from the National Institute of Health and National Institution of Alcohol Abuse and Alcoholism. The researcher covered personal expenses such as printing, photocopying and telephone calls.
CHAPTER 3
RESULTS
3.1 RESULTS FOR PREDICTION METHODS

3.1.1 Characteristics of the Participants
The first 103 women from the 300 pregnant women in the intervention group of the PMMS were selected. The socioeconomic and demographic characteristics of the participants can be seen in Table 3.1. Participants were all Xhosa speaking pregnant women with a mean age of 26.3 ± 5.5 years. The majority of women had South African identity documents (95.1%, n=98). This is essential for booking at the antenatal clinic, of which 76.6% (n=79) of the total women had done. Less than a quarter (22.3%, n=23) of the women reported being tested for TB during their current pregnancy. Out of those, only 1.9% (n=2) had positive results. Less than a quarter (22.3%, n=23) of the 95% that reported being tested for HIV were positive. The other 5% had either not been tested, or did not want to disclose their status. Only 6.7% (n=7) reported to be smokers. The majority of participants (51.4 %; n=53) had a Grade 8-11 education level. However, only a third (29.1%, n=30) had completed high school and only 5.8% (n=6) had tertiary education. There were slightly more single women (37.8%, n=39) than married women (33.9%, n=34) or living with their partner (28.1%, n=29). Just over half of the participants (53.3%; n=55) lived in an informal settlement and the average household member count was 4.1 ± 2.1.
### TABLE 3.1: Socio-economic and demographic (SED) characteristics of participants (Percentage and number, mean ± standard deviation)

<table>
<thead>
<tr>
<th>SED characteristics</th>
<th>Mean± SD or %</th>
<th>Number (n)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>26.3 ± 5.5</td>
<td>103</td>
</tr>
<tr>
<td>Smokers</td>
<td>6.7%</td>
<td>7</td>
</tr>
<tr>
<td>Identity document</td>
<td>95.1%</td>
<td>98</td>
</tr>
<tr>
<td>Xhosa speaking</td>
<td>100%</td>
<td>103</td>
</tr>
<tr>
<td>Booked at Antenatal clinic</td>
<td>76.6%</td>
<td>79</td>
</tr>
<tr>
<td><strong>TB or HIV status</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TB positive of those who tested (22.3%)</td>
<td>1.9%</td>
<td>2</td>
</tr>
<tr>
<td>HIV positive of those who tested (95%)</td>
<td>22.3%</td>
<td>23</td>
</tr>
<tr>
<td><strong>Marital Status</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>37.8%</td>
<td>39</td>
</tr>
<tr>
<td>Married</td>
<td>33.9%</td>
<td>34</td>
</tr>
<tr>
<td>Living with partner</td>
<td>28.1%</td>
<td>29</td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grade1-7</td>
<td>13.5%</td>
<td>14</td>
</tr>
<tr>
<td>Grade 8-11</td>
<td>51.4%</td>
<td>53</td>
</tr>
<tr>
<td>Grade 12</td>
<td>29.1%</td>
<td>30</td>
</tr>
<tr>
<td>Post matric diploma</td>
<td>5.8%</td>
<td>6</td>
</tr>
<tr>
<td><strong>Housing</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Household member count</td>
<td>4.1 ± 2.1</td>
<td></td>
</tr>
<tr>
<td>Formal structure</td>
<td>31.1%</td>
<td>32</td>
</tr>
<tr>
<td>Prefab in backyard</td>
<td>5.8%</td>
<td>6</td>
</tr>
<tr>
<td>Informal in backyard</td>
<td>9.7%</td>
<td>10</td>
</tr>
<tr>
<td>Informal settlement</td>
<td>53.3%</td>
<td>55</td>
</tr>
</tbody>
</table>

#### 3.1.2 Anthropometry, Pregravid BMI, GBMI and GRS

The average height, pregravid BMI and weight gain, GBMI and GRS classifications of the participants can be seen in table 3.2. Recalled pregravid BMI of the participants were classified as only 0.9% (n=1) underweight, whereas 32% (n=33) and 28.3% (n=29) respectively were classified as overweight and obese.

Thirty one point two percent (n=32), 33.9% (n=35) and 34.9% (n=36) of participants gained less, equal to and more than the IOM recommended weight gain respectively.
GBMI calculations classified the participants as underweight (7.8%, n=8), normal (38.8%, n=40), overweight (22.3%, n=23) and obese (31.1%, n=32).

Categorising the women according to their GRS score resulted in 19.4% (n=20, \( \bar{x} = 1.8 \pm 0.4 \)) classified as low risk, 56.4% (n=58, \( \bar{x} = 4.4 \pm 1.2 \)) intermediate risk and 24.2% (n=25 \( \bar{x} = 9.4 \pm 1.9 \)) classified as high risk.

**TABLE 3.2: Anthropometry, GBMI and GRS of participants (percentage and number or mean and standard deviation (sd))**

<table>
<thead>
<tr>
<th>Anthropometry</th>
<th>Mean ± SD or %</th>
<th>Number (n)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height</td>
<td>1.6 ± 0.05</td>
<td>103</td>
</tr>
<tr>
<td>Pregravid BMI (recalled)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pregravid BMI (recalled)</td>
<td>27.4 ±6.9</td>
<td></td>
</tr>
<tr>
<td>% Underweight</td>
<td>0.9%</td>
<td>1</td>
</tr>
<tr>
<td>% Normal</td>
<td>38.8%</td>
<td>40</td>
</tr>
<tr>
<td>% Overweight</td>
<td>32%</td>
<td>34</td>
</tr>
<tr>
<td>% Obese</td>
<td>28.3%</td>
<td>29</td>
</tr>
<tr>
<td>Weight Gain</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight gain</td>
<td>10.6 ±4.2</td>
<td></td>
</tr>
<tr>
<td>% Less than recommended</td>
<td>31.2%</td>
<td>32</td>
</tr>
<tr>
<td>% Equal to recommended</td>
<td>33.9%</td>
<td>35</td>
</tr>
<tr>
<td>% More than recommended</td>
<td>34.9%</td>
<td>36</td>
</tr>
<tr>
<td>GBMI</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GBMI</td>
<td>26.8 ± 5.7</td>
<td></td>
</tr>
<tr>
<td>% Underweight</td>
<td>7.8%</td>
<td>8</td>
</tr>
<tr>
<td>% Normal</td>
<td>38.8%</td>
<td>40</td>
</tr>
<tr>
<td>% Overweight</td>
<td>22.3%</td>
<td>23</td>
</tr>
<tr>
<td>% Obese</td>
<td>31.1%</td>
<td>32</td>
</tr>
<tr>
<td>GRS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GRS</td>
<td>5.1 ± 2.9</td>
<td></td>
</tr>
<tr>
<td>% low risk</td>
<td>19.4%</td>
<td>1.8 ± 0.4</td>
</tr>
<tr>
<td>% intermediate risk</td>
<td>56.4%</td>
<td>4.4 ± 1.2</td>
</tr>
<tr>
<td>% high risk</td>
<td>24.2%</td>
<td>9.4 ± 1.9</td>
</tr>
</tbody>
</table>

**BMI = Body Mass Index**

**GBMI = Gestational Body Mass Index**

**GRS = Gestational Risk Score**
3.1.3 Maternal Morbidity

Almost four percent (3.8%; n=4) of the pregnant mothers had Type II DM before pregnancy, but none were receiving medication. None of the mothers in this sub-sample developed GDM. Almost six percent (5.8%; n=6) of the pregnant mothers had hypertension before pregnancy, but none received medication. Approximately fifteen percent (14.5% n=15) of the participants developed GHPT, and four of these women received prescribed hypertensive medication.

3.1.4 Birth Outcomes

Birth outcomes can be seen in table 3.3. The majority of mothers (63.7%, n=65) stayed one day or less in the hospital after giving birth, whilst 36.3% (n=38) stayed more than one day. More than half of the babies (56.8%, n=58) spent longer than 24 hours in hospital, with the majority of these babies (64.7%, n=66) staying less than 3 days. More males (58.8%, n=60) than females (41.2%, n=43) were born. There were 83.3% (n=85) vaginal deliveries. The majority (63.7%, n=65) of the infants were born at normal term and one third (33.3%, n=34) were preterm. Ten (9.8%) of the infants were LBW, one infant (0.98%) was greater than 4.5kg, 15.6% (n=16) were SGA and 23.5% (n=24) were LGA. The mean birth weight, birth length and birth head circumference were 3.15 kg ± 0.45, 49.75 cm ± 1.5 and 34.75 cm ± 3.1 respectively. All of these means were between the 10th and 50th percentile for a normal term birth. Approximately a sixth of the infants were below the 10th percentile for weight (15.6%, n=16), length (15.6%, n=16) and almost a quarter were below the 10th percentile for head circumference (23.5%, n=24). There was one maternal death and no miscarriages, stillbirths or neonatal deaths.
**TABLE 3.3: Birth Outcomes of infants (percentage and number or mean ± standard deviation (sd))**

<table>
<thead>
<tr>
<th>Birth Outcomes</th>
<th>Percentage (%)/mean ±sd</th>
<th>Number (n)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Maternal hospital stay</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 1 day hospital duration</td>
<td>28.4%</td>
<td>29</td>
</tr>
<tr>
<td>1 day hospital duration</td>
<td>35.3%</td>
<td>36</td>
</tr>
<tr>
<td>&gt; 1 day hospital duration</td>
<td>36.3%</td>
<td>38</td>
</tr>
<tr>
<td><strong>Baby hospital duration</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baby spent longer than 24 hours in</td>
<td></td>
<td></td>
</tr>
<tr>
<td>hospital</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 3 days</td>
<td>56.8%</td>
<td>58</td>
</tr>
<tr>
<td>&gt; 3 days, &lt; 2 weeks</td>
<td>64.7%</td>
<td>66</td>
</tr>
<tr>
<td>&gt; 2 weeks</td>
<td>31.3%</td>
<td>32</td>
</tr>
<tr>
<td></td>
<td>4%</td>
<td>5</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Males born</td>
<td>58.8%</td>
<td>60</td>
</tr>
<tr>
<td>Females born</td>
<td>41.2%</td>
<td>43</td>
</tr>
<tr>
<td><strong>Delivery mode</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vaginal delivery</td>
<td>83.3 %</td>
<td>85</td>
</tr>
<tr>
<td>Caesarian section</td>
<td>16.7 %</td>
<td>18</td>
</tr>
<tr>
<td><strong>Gestational period</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Preterm babies born</td>
<td>33.3%</td>
<td>34</td>
</tr>
<tr>
<td>Normal term babies born</td>
<td>63.7%</td>
<td>65</td>
</tr>
<tr>
<td>Over term babies born</td>
<td>3%</td>
<td>4</td>
</tr>
<tr>
<td><strong>Mean birth weight</strong></td>
<td>3.15 ± 0.45</td>
<td></td>
</tr>
<tr>
<td><strong>Birth weight percentile</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;10&lt;sup&gt;th&lt;/sup&gt;</td>
<td>15.6%</td>
<td>16</td>
</tr>
<tr>
<td>&lt;50&lt;sup&gt;th&lt;/sup&gt;</td>
<td>33.4%</td>
<td>34</td>
</tr>
<tr>
<td>&lt;90&lt;sup&gt;th&lt;/sup&gt;</td>
<td>29.5%</td>
<td>31</td>
</tr>
<tr>
<td>&lt;97&lt;sup&gt;th&lt;/sup&gt;</td>
<td>21.5%</td>
<td>22</td>
</tr>
<tr>
<td>LBW</td>
<td>9.8%</td>
<td>10</td>
</tr>
<tr>
<td>Macrosomic</td>
<td>0.98%</td>
<td>1</td>
</tr>
<tr>
<td>Small for gestational age</td>
<td>15.6%</td>
<td>16</td>
</tr>
<tr>
<td>Large for gestational age</td>
<td>23.5%</td>
<td>24</td>
</tr>
<tr>
<td><strong>Mean birth length</strong></td>
<td>49.75 ± 1.5</td>
<td></td>
</tr>
<tr>
<td><strong>Birth length percentile</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;10&lt;sup&gt;th&lt;/sup&gt;</td>
<td>15.6%</td>
<td>16</td>
</tr>
<tr>
<td>&lt;50&lt;sup&gt;th&lt;/sup&gt;</td>
<td>30.3%</td>
<td>31</td>
</tr>
<tr>
<td>&lt;90&lt;sup&gt;th&lt;/sup&gt;</td>
<td>28.5%</td>
<td>30</td>
</tr>
<tr>
<td>&lt;97&lt;sup&gt;th&lt;/sup&gt;</td>
<td>25.6%</td>
<td>26</td>
</tr>
<tr>
<td><strong>Mean birth head circumference</strong></td>
<td>34.75 ± 3.1</td>
<td></td>
</tr>
<tr>
<td><strong>Birth head circumference percentile</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;10&lt;sup&gt;th&lt;/sup&gt;</td>
<td>23.5%</td>
<td>24</td>
</tr>
<tr>
<td>&lt;50&lt;sup&gt;th&lt;/sup&gt;</td>
<td>31.3%</td>
<td>32</td>
</tr>
<tr>
<td>&lt;90&lt;sup&gt;th&lt;/sup&gt;</td>
<td>28.5%</td>
<td>30</td>
</tr>
<tr>
<td>&lt;97&lt;sup&gt;th&lt;/sup&gt;</td>
<td>16.7%</td>
<td>17</td>
</tr>
<tr>
<td>Adverse outcomes</td>
<td>Percentage (%)/mean ±sd</td>
<td>Number (n)</td>
</tr>
<tr>
<td>------------------------</td>
<td>--------------------------</td>
<td>------------</td>
</tr>
<tr>
<td>Maternal deaths</td>
<td>0.97%</td>
<td>1</td>
</tr>
<tr>
<td>Miscarriage</td>
<td>0%</td>
<td>0</td>
</tr>
<tr>
<td>Stillbirth</td>
<td>0%</td>
<td>0</td>
</tr>
<tr>
<td>Neonatal death</td>
<td>0%</td>
<td>0</td>
</tr>
</tbody>
</table>

3.1.5 Prediction Methods

Table 3.4 is a summary of the prediction strength of the following methods: IOM pregravid BMI, IOM weight gain, GBMI and GRS. The significant values are highlighted in red.
### TABLE 3.4: The strength of three different methods to predict various birth outcomes and maternal morbidity

<table>
<thead>
<tr>
<th>Birth Outcomes</th>
<th>IOM PPBMI p value</th>
<th>IOM weight gain p value</th>
<th>GBMI method p value</th>
<th>GRS method p value</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gestational age</td>
<td>( r=0.02 )</td>
<td>( r=0.07 )</td>
<td>( r=0.03 )</td>
<td>( r=0.03 )</td>
<td>0.79</td>
</tr>
<tr>
<td>BW percentile</td>
<td>( r=0.11 )</td>
<td>( r=0.05 )</td>
<td>( r=-0.1 )</td>
<td>( r=0.02 )</td>
<td>0.25</td>
</tr>
<tr>
<td>BL percentile</td>
<td>( r=0.11 )</td>
<td>( r=0.05 )</td>
<td>( r=0.00 )</td>
<td>( r=0.02 )</td>
<td>0.45</td>
</tr>
<tr>
<td>BHC percentile</td>
<td>( r=0.22^* )</td>
<td>( r=0.41 )</td>
<td>( r=-0.16 )</td>
<td>( r=0.22^* )</td>
<td>0.03</td>
</tr>
<tr>
<td>Delivery type</td>
<td>( U=2.65 )</td>
<td>( U=0.2 )</td>
<td>( U=1.37 )</td>
<td>( U=1.88 )</td>
<td>0.19</td>
</tr>
<tr>
<td>Birth duration</td>
<td>( KX^2=0.8 )</td>
<td>( KX^2=3.73 )</td>
<td>( KX^2=0.68 )</td>
<td>( KX^2=0.16 )</td>
<td>0.52</td>
</tr>
<tr>
<td>Baby hospital duration</td>
<td>( KX^2=0.11 )</td>
<td>( KX^2=2.7 )</td>
<td>( KX^2=0.01 )</td>
<td>( KX^2=4^* )</td>
<td>P&lt;0.01</td>
</tr>
<tr>
<td>Macro-sonic</td>
<td>Unable to analyse</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LBW</td>
<td>( U=0.02 )</td>
<td>( U=0.11 )</td>
<td>( U=0.001 )</td>
<td>( U=0.3 )</td>
<td>0.86</td>
</tr>
<tr>
<td>SGA/LGA</td>
<td>( U=0.08 )</td>
<td>( U=0.28 )</td>
<td>( U=0.26 )</td>
<td>( U=0.001 )</td>
<td>0.75</td>
</tr>
<tr>
<td>GHPT</td>
<td>( U=0.08 )</td>
<td>( U=0.7 )</td>
<td>( U=0.29 )</td>
<td>( U=2.4 )</td>
<td>0.07</td>
</tr>
<tr>
<td>GDM</td>
<td>Unable to analyse</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\(^*p<0.05\) is significant

BW – Birth Weight
BL – Birth Length
BHC – Birth Head Circumference
IOM PPBMI – Institute of Medicine Pre-pregnancy BMI
IOM – Institute of Medicine
GBMI – Gestational BMI
GRS – Gestational Risk Score
\( r \) = Spearman’s correlation coefficient used between all groups (except weight gain) and the following birth outcomes; gestational age, birth weight percentile, birth length percentile, birth HC percentile
\( KX^2 \) = Kruskall Wallis coefficient used between all groups (except weight gain) and the following birth outcomes; birth hospital duration and baby hospital duration. Also used between weight gain and gestational age, birth weight percentile, birth length percentile, birth HC percentile
\( U \) = Mann-Whitney coefficient used between all groups (except weight gain) and the following birth outcomes; delivery type, LBW, SGA, LGA and gestational hypertension.
\( CX^2 \) = Chi-square coefficient. This test was used to analyse the relationship between the weight gain group and the following birth outcomes; delivery type, birth hospital duration, baby hospital duration, LBW, SGA, LGA and gestational hypertension.
3.1.5.1 Prediction of IOM pregravid BMI and weight gain methods

A significant positive association was found between pregravid BMI and birth HC percentile \((r=0.22, \ p=0.03)\). The greater the pregravid BMI, the greater the birth HC percentile. No birth outcome parameters or maternal morbidities were found to be significantly different in any of the three IOM weight gain categories.

3.1.5.2 Prediction of GBMI Method

There was no significance found between GBMI and any of the birth outcomes or maternal morbidities.

3.1.5.3 Prediction of GRS Method

A significant positive association was found between GRS and birth HC percentile \((r=0.22, \ p=0.03)\) (Figure 3.1). This significant difference was only found between the low risk and intermediate risk groups. The greater the GRS, the greater the birth HC percentile.

![FIGURE 3.1: Positive association between GRS and Head Circumference Percentile](image-url)
The higher the GRS, the higher the risk of an infant spending longer time in the hospital (Kruskal Wallis $X^2 = 4$, $p<0.01$) (Figure 3.2) This was only found to be significant between the groups of infants who stayed less than 3 days and more than 3 days, but less than 2 weeks. The number of babies in the ‘more than 2 weeks’ group were too few to analyse.

**FIGURE 3.2:** Significant difference between all GRS categories and time baby spent in hospital
3.2 RESULTS FOR SEV

3.2.1 Characteristics of Participants

The first 205 pregnant women from the 600 women in the intervention and control groups of the PMMS were selected. Characteristics and anthropometry of participants are shown in table 3.5. The mean age of participants was 26.59 ± 5.50 years. The mean height of the women was 1.59 m ± 0.05. The mean GBMI was 27.17 ± 6.08 and the majority of the group (44.8%, n=92) fell in the normal weight category.

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Mean ± sd</th>
<th>Percentage (%)</th>
<th>Number (n)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>26.59 ± 5.50</td>
<td></td>
<td>205</td>
</tr>
<tr>
<td>Height</td>
<td>1.59 ± 0.05</td>
<td></td>
<td>205</td>
</tr>
<tr>
<td>GBMI</td>
<td>27.17 ± 6.08</td>
<td></td>
<td>205</td>
</tr>
<tr>
<td>% Underweight (GBMI)</td>
<td></td>
<td>3.9</td>
<td>8</td>
</tr>
<tr>
<td>% Normal (GBMI)</td>
<td></td>
<td>44.8</td>
<td>92</td>
</tr>
<tr>
<td>% Overweight (GBMI)</td>
<td></td>
<td>19</td>
<td>39</td>
</tr>
<tr>
<td>% Obese (GBMI)</td>
<td></td>
<td>32.3</td>
<td>66</td>
</tr>
</tbody>
</table>

GBMI – Gestational Body Mass Index

3.2.2 Adverse Birth Outcomes

There was one (0.48%) maternal death, no miscarriages, two (0.97%) stillbirths, one (0.48%) neonatal death and two (0.97%) infant deaths.

3.2.3 Maternal Morbidities

One percent (n=2) of the participants developed GDM and were put onto medication. Twenty percent (n=41) developed GHPT, and four percent (n=16) of these women were put onto prescribed hypertensive medication.
3.2.4 Socioeconomic Characteristics

The socioeconomic characteristics of the participants can be seen in table 3.6. All participants were Xhosa speaking, and a low percentage reported to be smokers (7.8%, n=16). Ninety one percent of the participants had identity documents (n=187). There were slightly more single women (40%, n=82) than, married women (34.1%, n=70) or women living with their partner (25.9%, n=53). The average parity was 1.84 ± 1.14. Ten percent (n=21) of the participants had tried to terminate previous pregnancies and 8.7% (n=18) had one previous stillbirth and one previous LBW infant. During this pregnancy, 21.5% (n=44) and 94.6% (n=194) had reported being tested for TB and HIV respectively. Of those tested, 0.97, (n=2) had TB and 29.3% (n=60) were HIV positive. The majority of the women (53.3%, n=109) lived in an informal shack, 86% (n=176) had access to electricity and just under half (48.7%, n=100) of the women used a community tap as their water source. Electricity was the major source of cooking fuel (77.1%, n=158). Two thirds of the women had not finished school (67.3%, n=138). Only 20% (n=41) of the women were employed and a third (33.3%, n=68) of the women earned less than SAR 500 ($65) per month.
### TABLE 3.6: Socioeconomic characteristics of participants (percentage and number or mean ± standard deviation (sd))

<table>
<thead>
<tr>
<th>CHARACTERISTICS</th>
<th>MEAN ± SD</th>
<th>PERCENTAGE (%)</th>
<th>NUMBER (N)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smokers</td>
<td>7.8</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>Identity Document</td>
<td>91.2</td>
<td>187</td>
<td></td>
</tr>
<tr>
<td>Xhosa speaking</td>
<td>100</td>
<td>205</td>
<td></td>
</tr>
<tr>
<td><strong>MARITAL STATUS</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>40</td>
<td>82</td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>34.1</td>
<td>70</td>
<td></td>
</tr>
<tr>
<td>Living with partner</td>
<td>25.9</td>
<td>53</td>
<td></td>
</tr>
<tr>
<td>Parity</td>
<td>1.84 ± 1.14</td>
<td>205</td>
<td></td>
</tr>
<tr>
<td>Terminations of pregnancies</td>
<td>10.2</td>
<td>21</td>
<td></td>
</tr>
<tr>
<td><strong>PREVIOUS STILL BIRTHS</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>8.7</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>0.97</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td><strong>PREVIOUS LBW BABIES</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>8.7</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>0.97</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td><strong>TB AND HIV STATUS</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TB tested this pregnancy</td>
<td>21.5</td>
<td>44</td>
<td></td>
</tr>
<tr>
<td>Positive TB result</td>
<td>0.97</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>HIV test this pregnancy</td>
<td>94.6</td>
<td>194</td>
<td></td>
</tr>
<tr>
<td>Positive HIV result</td>
<td>29.3</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td>Household count</td>
<td>4.28 ± 2.14</td>
<td>205</td>
<td></td>
</tr>
<tr>
<td><strong>TYPE OF HOUSING</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Formal brick structure</td>
<td>29.2</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td>Prefab in backyard</td>
<td>6.3</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td>Shack in backyard</td>
<td>11.2</td>
<td>23</td>
<td></td>
</tr>
<tr>
<td>Informal shack</td>
<td>53.3</td>
<td>109</td>
<td></td>
</tr>
<tr>
<td><strong>WATER SOURCE</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water in house</td>
<td>19</td>
<td>39</td>
<td></td>
</tr>
<tr>
<td>Water on premises</td>
<td>32.3</td>
<td>66</td>
<td></td>
</tr>
<tr>
<td>Community tap</td>
<td>48.7</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td><strong>EDUCATION</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grade 3-7</td>
<td>11.2</td>
<td>23</td>
<td></td>
</tr>
<tr>
<td>Grade 8-11</td>
<td>56.1</td>
<td>115</td>
<td></td>
</tr>
<tr>
<td>Grade 12</td>
<td>29.7</td>
<td>61</td>
<td></td>
</tr>
<tr>
<td>Post Grad diploma</td>
<td>3</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td><strong>EMPLOYMENT</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employed</td>
<td>20</td>
<td>41</td>
<td></td>
</tr>
<tr>
<td>Full time</td>
<td>9.8</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Part-time</td>
<td>4.4</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>Self-employed</td>
<td>4.9</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Temporary contract</td>
<td>0.97</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>
## Table 3.7: Comparison of possession of items between SADHS(2003) and this sub-study (percentage)

<table>
<thead>
<tr>
<th>Item</th>
<th>SADHS, 2003 (%)</th>
<th>PMMS Sub-Study (%)</th>
<th>Number (n)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Urban</td>
<td>Rural</td>
<td></td>
</tr>
<tr>
<td>Bicycle</td>
<td>15.6</td>
<td>14.8</td>
<td>7.8</td>
</tr>
<tr>
<td>Car</td>
<td>31.8</td>
<td>12.2</td>
<td>10.2</td>
</tr>
<tr>
<td>Radio</td>
<td>80.3</td>
<td>69.4</td>
<td>66.8</td>
</tr>
<tr>
<td>Cellular phone</td>
<td>63.4</td>
<td>41.3</td>
<td>92.1</td>
</tr>
<tr>
<td>Telephone</td>
<td>34</td>
<td>5.7</td>
<td>0.97</td>
</tr>
<tr>
<td>Fridge</td>
<td>71.2</td>
<td>37.1</td>
<td>68.8</td>
</tr>
<tr>
<td>TV</td>
<td>74.6</td>
<td>40.6</td>
<td>80</td>
</tr>
<tr>
<td>Computer</td>
<td>15.9</td>
<td>2</td>
<td>0.97</td>
</tr>
</tbody>
</table>

### 3.2.5 Relationship between GBMI, GHTP, GDM and SEV

Table 3.8 show a summary of the relationships between the SEV and GBMI, GHTP and GDM. The significant associations are highlighted in red.
### TABLE 3.8: Relationship between socioeconomic variables and Gestational Body Mass Index (GBMI) or Gestational Hypertension (GHPT) or Gestational Diabetes Mellitus (GDM)

<table>
<thead>
<tr>
<th>SEDF</th>
<th>Relationship with GBMI</th>
<th>Relationship with GHPT</th>
<th>Relationship with GDM</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>p value</td>
<td>p value</td>
<td>p value</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td>r=0.33* 0.00</td>
<td>U=3.41 0.07</td>
<td>U=1.02 0.35</td>
</tr>
<tr>
<td><strong>Smoking</strong></td>
<td>U=-0.95 0.33</td>
<td>CX² = 0.21 0.64</td>
<td>CX² = 0.33 0.56</td>
</tr>
<tr>
<td><strong>Height</strong></td>
<td>r = -0.15* 0.03</td>
<td>U=1.29 0.26</td>
<td>U=0.017 0.97</td>
</tr>
<tr>
<td><strong>Marital Status</strong></td>
<td>KX² = 9.35 &lt;0.01</td>
<td>CX² = 4.09 0.12</td>
<td>CX² = 4.39 0.11</td>
</tr>
<tr>
<td><strong>ID Document</strong></td>
<td>U = 1.75 0.07</td>
<td>CX² = 1. 0.27</td>
<td>CX² = 0.37 0.54</td>
</tr>
<tr>
<td><strong>Home Language</strong></td>
<td>None, all participant’s home language was Xhosa</td>
<td>None, all participant’s home language was Xhosa</td>
<td>None, all participant’s home language was Xhosa</td>
</tr>
<tr>
<td><strong>Parity</strong></td>
<td>r=0.23* 0.00</td>
<td>U=0.17 0.8</td>
<td>U=1.09 0.22</td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td>r=0.01 0.86</td>
<td>U=3.8 0.52</td>
<td>U=0.024 0.75</td>
</tr>
<tr>
<td><strong>Employment</strong></td>
<td>U=2.9* &lt;0.003</td>
<td>CX² = 0.46 0.49</td>
<td>CX² = 0.9 0.34</td>
</tr>
<tr>
<td><strong>Income</strong></td>
<td>r=0.2* 0.00</td>
<td>U=0.28 0.65</td>
<td>U=0.31 0.57</td>
</tr>
<tr>
<td><strong>HH member count</strong></td>
<td>r=0.07 0.53</td>
<td>U=0.99 0.47</td>
<td>U=0.72 0.43</td>
</tr>
<tr>
<td><strong>Housing</strong></td>
<td>KX²=0.36 0.72</td>
<td>CX² = 2.67 0.44</td>
<td>CX² = 2.94 0.4</td>
</tr>
<tr>
<td><strong>Water source</strong></td>
<td>KX²=0.96 0.77</td>
<td>CX² = 3.35 0.34</td>
<td>CX² = 2.89 0.4</td>
</tr>
<tr>
<td><strong>Toilet</strong></td>
<td>KX²=1.23 0.12</td>
<td>CX² = 6.79 0.23</td>
<td>CX² = 0.85 0.13</td>
</tr>
<tr>
<td><strong>TB status</strong></td>
<td>U=0.6 0.54</td>
<td>CX² = 0.71 0.39</td>
<td>CX² = 1 0.12</td>
</tr>
<tr>
<td><strong>HIV status</strong></td>
<td>U=2.54* 0.01</td>
<td>CX² = 0.25 0.62</td>
<td>CX² = 4.96* 0.02</td>
</tr>
</tbody>
</table>

*p<0.05 is statistically significant

r= Spearman’s correlation coefficient used between GBMI and age, height, parity, education, income and HH member count.

KX²=Kruskall Wallis coefficient used between GBMI and marital status, type of housing water source, toilet type

U=Mann-Whitney coefficient used between GBMI and smoking, identity document, employment, TB status and HIV status. It was also used between GHPT and age, height, parity. It was also use between GDM and age, height, parity.

CX²=Chi-square coefficient was used GHPT and smoking, marital status, identity document, employment, type of housing, type of water source, toilet type TB status and HIV status. The Mann-Whitney coefficients It was also used between GDM and smoking, marital status, identity document, employment, type of housing, type of water source, toilet type TB status and HIV status.
A significant positive association was found between GBMI and the following SEV; age, height, parity, income, marital status, employment and HIV status. There was no statistically significant relationship found between GBMI and the following SEV: smoking, education, ID document, household member count, type of housing, water source, type of toilet and TB status.

A positive association \((r=0.33, p=0.00)\) between GBMI and the mother's age can be seen in figure 3.3.

![Graph showing positive association between Gestational Body Mass Index (GBMI) and mother's age](image)

**FIGURE 3.3:** Positive association between Gestational Body Mass Index (GBMI) and mother's age

A negative association \((r=-0.15, p=0.03)\) can be seen between GBMI and the mother's height in figure 3.4. A positive association \((r=0.23, p=0.00)\) between GBMI and parity can be seen in figure 3.5.
**FIGURE 3.4:** Negative association between GBMI and mother's height

**FIGURE 3.5:** Positive association between GBMI and parity
A positive association ($r=0.20$, $p=0.00$) between GBMI and income can be seen in figure 3.6.

**FIGURE 3.6:** Positive association between GBMI and mother’s income

A positive association ($p=<0.01$) between GBMI and marital status can be seen in figure 3.7. This association is between single and married groups only.
FIGURE 3.7: Positive association between GBMI and mother's marital status (p<0.01)

A positive association (p<0.003) between GBMI and employment status can be seen in figure 3.8.
FIGURE 3.8: Positive association between GBMI and mother’s employment status (p<0.003)

A significant difference (p<0.01) can be seen between all three categories of GBMI and HIV status in figure 3.9.
FIGURE 3.9: Significant difference between all three categories of GBMI and HIV status (p<0.01)

No statistically significant relationships were found between GHPT and the SEV. The association between GHPT and age (U=3.41, p=0.07) did reach borderline statistical significance.

No statistically significant relationships were found between GDM and the SEV. A significant difference was found between GDM and HIV status however, as only two of the participants developed GDM, no significant conclusions can be drawn.
CHAPTER 4
DISCUSSION
4.1 Discussion for prediction methods

This sub-study found some promising results with regards to the prediction strength of the GRS method, to predict a few adverse birth outcomes. No miscarriages, stillbirths or neonatal deaths were reported during the course of this sub-study. One maternal death was recorded. This participant was in the obese category for GBMI and had an intermediate GRS. There was only one macrosomic infant and no women who developed GDM and therefore these parameters could not be analysed. It is possible that there was only one macrosomic baby as there were no women with GDM.

A reason for the low prevalence of GDM in this sub-study could be the low mean age which is comparable with Mamabola et al (2007) who also found a low prevalence of GDM in the Limpopo province. Whereas Huddle (2005) found a higher prevalence, but their participants’ mean age was 7.31 years higher.

Unlike other studies, gestational impaired glucose tolerance (GIGT) was not measured. It has been found that women with GIGT are at more of a risk of giving birth to a LGA infant. In this sub-study, almost a quarter (23.5%) of the infants were LGA. Referral does not always take place and therefore GIGT and GDM diagnosis could have been missed in this sub-study and the PMMS.

Prevalence of hypertension (HPT) is increasing in South Africa due to obesity and was found to be 25% in women. It was found that 15.7% of maternal deaths were due to complications of HPT during pregnancy. Over half (58.5%) of maternal deaths are deemed avoidable due to GHPT. The majority of the adverse events are due to postpartum problems. If the mothers are placed in a high risk category, more observation and monitoring can take place.

There were more than double the number (15.5%, n=16) of women in this sub-study who had GHPT compared to other South African studies. This could be due to the fact that the majority of both studies’ participants were from more rural regions of South Africa, whereas this study’s participants had the influence of urbanisation on
their weight. Overweight and obese women are at a greater risk of developing GHPT. It is frequently exposed by pregnancy and the mother often develops hypertension later in life and it is regularly associated with other co-morbidities, such as cardiovascular disease and diabetes. It would be beneficial for reducing maternal and infant mortality if there was another way of assessing high risk pregnancies and births.

The IOM method is probably unsuitable to use to predict high risk pregnancies in a peri-urban population due to the fact that pregnant women usually first attend the clinic in their second or third trimester (mean= 5.5months). Pregravid weight is therefore recalled and not accurately measured. Studies looking at pregravid weight in poor to middle income countries rely on self-reporting. Studies have also found that in South Africa overweight and obese black African women often underreport their weight. The rate of weight gain is also difficult to measure due to the irregular clinic visits and some of the women not returning to the clinic. The IOM prediction results obtained from this sub-study need to be used with caution due to the recalled pregravid BMI. The categories of recalled pregravid BMI and GBMI are however similar for all groups except for the underweight category. It therefore appeared that in this sub-study, the participants recalled relatively accurately, however this accuracy does depend on the population.

When analysing the IOM pregravid BMI method, the only outcome it predicted, was the birth HC percentile, the lower the pregravid BMI, the lower the birth HC percentile. A small HC can indicate reduced brain size, decreased cognitive development and lower intelligence. A large HC can indicate hydrocephalus. This is in agreement with Ronnenberg et al (2003) who found that low pregravid BMI was associated with smaller HC (n=575). On the other hand, Bhargave's (2000) investigation on pregnant Kenyan women did not find a significant association between pregravid BMI and birth HC, but their study was smaller than the Ronnenberg study (n=100).
The IOM weight gain categories were not statistically significant for predicting any of the parameters. This is in contrast to Sieger-Riz (1994)\textsuperscript{109} who found that pregravid underweight women and poor gestational weight gain for under- and overweight groups had a greater chance of giving birth prematurely.\textsuperscript{109} This sub-study’s results are more in agreement with Murakami et al (2005)\textsuperscript{114} who found that pregravid BMI was a better predictor of adverse birth outcomes than maternal weight gain. In a meta-analysis (n=25) conducted by the WHO it was found that both low pregravid BMI and inadequate weight gain were predictors of LBW and VLBW infants.\textsuperscript{56} The reason that there was a low percentage of LBW infants (9.8%, n=10) in this sub-study could be because there was only one participant with a reported low pregravid BMI. A review (27 studies) found that pregravid BMI was a strong predictor of IUGR and preterm births.\textsuperscript{116} Again this was not found in this sub-study, but the sample size was smaller than many of the studies that were reviewed and some of the studies were conducted in high income countries. Although this method is used in many countries, it does not seem the most appropriate one for a peri-urban setting.

The GBMI method predicted no birth outcomes or maternal morbidities. These findings are not in agreement with other considerably larger studies, that have found that GBMI is positively associated with both birth weight\textsuperscript{23,125,126} and HC\textsuperscript{23,126}. Cruz et al (2007)\textsuperscript{23} found that GBMI was also predictive of birth length, which this sub-study did not find. A large study (46 national surveys from 36 developing countries) found that women with a low BMI during pregnancy gave birth to smaller babies.\textsuperscript{124} They also found that this was a predictor for preterm and neonatal mortality, whereas this sub-study did not.\textsuperscript{124} This could be due to the fact that there were only 7.8% of women in the underweight category. Unlike this sub-study, other bigger studies have also found that maternal GBMI has been a predictor of delivery outcome.\textsuperscript{4,46,59} GBMI was not found to be a predictor of GHPT, this is in disagreement with many studies.\textsuperscript{4,23,42,43} This could again be due to the fact that the sample size was much smaller. There are positive predictive findings when using the GBMI method. It would be beneficial to repeat this sub-study with a larger sample in a peri-urban setting. Weight and height have been recorded in the majority of antenatal clinics in the Western Cape (97% and 90.4% respectively).\textsuperscript{5}
With appropriate training and calibrated equipment, the GBMI equation method is simple to calculate with these anthropometric measurements and the number of gestational weeks using either the sonar method if the mother comes early in the pregnancy or the last menstrual cycle method. It could be an appropriate method to assist in predicting high risk pregnancies in the future.

The GRS predicted the following birth outcome parameters: birth head circumference percentile and the length of time the baby spent in hospital. The higher the GRS, the more likely a women will give birth to an infant with a bigger HC percentile. The higher the GRS, the higher the risk of an infant spending longer time in hospital. This was only found to be significant between the groups less than three days and more than three days, but less than two weeks. The number of babies who were in the more than two weeks group, were too few to calculate. Less than 0.1% had not yet booked at the antenatal clinic, of these there were more from the intermediate group (n=5), than the high (n=3) and low (n=2) groups. This differed from Barros’s results as he found more of the women from the high risk groups tended not to book at the antenatal clinics. A similarity was found compared to the study by Barros, where women from the high risk group had more caesarian sections than women from the intermediate group, although this was not statistically significant. It is difficult to compare this sub-study as there were such small numbers in each category compared to Barros’s study.

4.2 Discussion for SEV

This sub-study is one of the few to look at the associations between SEV and GBMI and maternal morbidities in a peri-urban pregnant black population in South Africa. The possession of the following items was found to be more comparable to the rural parts of the South African population and lower than the urban parts: radio, car, telephone and computer. The reason for this is that although these items are more readily available in peri-urban areas, they are expensive to buy and maintain (with the exception of radios). The ownership of fridges and televisions was found to be more comparable to the urban parts of South Africa. This could be due to the fact that these items would be more accessible, deemed more essential and require
electricity which is more readily available in the peri-urban areas. The number of participants with cellphones was higher than both urban and rural areas. This could be explained by the fact that this sub-study took place six years after the SADHS and cellphones are currently more accessible and cheaper.\textsuperscript{148}

Risk factors for developing GDM are age, ethnicity, genetic predisposition, parity, history of abnormal blood glucose and obesity.\textsuperscript{43,71} There were only two participants (0.97\%) with GDM. As mentioned previously, this low prevalence is comparable with Mamabola et al (2007)\textsuperscript{66}, but lower than Huddle (2005)\textsuperscript{62}. GDM is easy to treat but needs to be detected early, referral and diagnosis is often missed (Huddle, 2005).\textsuperscript{62}

There were more than double the number (20\%, n=41) of women in this sub-study who had GHPT compared to Mamabola’s\textsuperscript{66} (6.8\%, n=262) study and Buga’s\textsuperscript{97} (4.6\%, n=760). This could be due to the fact that the majority of both studies’ participants were from rural regions, whereas this study’s participants had the influence of urbanisation on their weight.\textsuperscript{51} Overweight and obese women are at a greater risk of developing GHPT.\textsuperscript{93} It is frequently exposed by pregnancy and the mother often develops hypertension later in life and it is regularly associated with other co-morbidities, such as cardiovascular disease and diabetes.\textsuperscript{94} The increasing burden of non-communicable diseases in SA could be exacerbating GHPT.\textsuperscript{80}

In this sub-study, an overall improvement was found in the education statistics compared to a study conducted by Hoffman in the same population 12 years before and the SADHS (2003).\textsuperscript{5,17} Every participant had attended school for at least three years, 85.8\% (n=176) had started secondary school, and 29.7\% (n=61) had completed their final year of school. The SADHS identified younger and more urbanised individuals to have a higher education level.\textsuperscript{5} This study had a relatively young population (26.59 ± 5.5 years), and this could explain why the education level was higher. Another reason for the improvements could be due to government initiatives to rectify imbalances in schools across the country since the fall of apartheid and the introduction of fee-free schools.\textsuperscript{149} The number of women who had obtained a post-graduate diploma (3\%, n=6) was comparable to the Khayalitsha
population register, but lower than the SADHS figures (6.7%). The reason for this disparity could be due to the SADHS including all populations of the Western Cape. No relationship was found between education levels and GBMI, GHPT or GDM in this sub-study, unlike findings from previous studies. This could be explained by the smaller sample size and the fact that the population was more urbanised.

Twenty percent (n=41) of the sub-sample were employed. This is 34.6% and 35% less than Hoffmann’s study and the SADHS respectively. Discrepancies between these results could be due to the smaller sample size used and the population density of Khayelitsha has increased vastly since the other studies were conducted. In addition the worldwide recession could have had an impact on employment statistics. There was a significant positive association found between employment and GBMI. This is similar to the findings of Hoffman, but different to the findings of other studies conducted in poor to middle income countries. They all found that women who were employed had a higher GBMI and therefore had a higher risk of developing maternal morbidities. A reason provided by Bourne et al (2002) is that with an increase in employment, individuals have less time to cook healthy time-consuming meals and tend to buy more high-fat ‘fast’ food on their way home from work.

There was however a significant positive association between income and GBMI. This is in agreement with other studies that established that an increase in income in a peri-urban setting resulted in a more ‘western’ diet which was lower in carbohydrate and higher in fat. This led to an increase in obesity, and therefore an increase in chronic diseases of lifestyle.

The average age of the participants in this sub-study was comparable to other maternal studies conducted in Khayelitsha, but younger than studies conducted in high-income countries. There was a significant positive correlation with age and GBMI and the relationship between age and GHPT was close to significance. This is in agreement with other studies, where older women had higher GBMI and therefore had an increased risk of developing GHPT. No significant
association was found between age and GDM. High maternal age is one of the most recognised risk factors for developing GDM.\textsuperscript{67} The discrepancy could be explained by the younger mean maternal age and diagnosis of GDM could have been missed.\textsuperscript{62,66}

The average parity in this sub-study was 0.86 lower than the mean African black population.\textsuperscript{6} The discrepancy could be due to the much smaller sample size and this sub-study did not measure the parity of both urban and rural populations. The lower number could also be due to the increased urbanisation and family planning offered to women which has been seen in the rest of South Africa.\textsuperscript{6} There was a significant association with parity and GBMI, but none with parity and the maternal morbidities in this sub-study. It should then follow that if parity is reduced, obesity should also be reduced, but it has been found that black African women retain more weight postpartum and this outweighs the effect of reduced parity.\textsuperscript{4}

The average height in the participants is comparable with various other studies conducted in a peri-urban setting.\textsuperscript{5,51} Similarly to other studies, a positive association was found between height and GBMI.\textsuperscript{156-158} The evidence suggests that shorter women (height <1.51m) are found to have lower socio-economic status and may have been subjected to foetal and/or childhood under-nutrition .\textsuperscript{156} No association was found between height and GDM, but other studies have found that impaired glucose homeostasis has been associated with shorter individuals.\textsuperscript{156-158} No association was found between height and GHPT.

The percentage of people living in formal brick structures was 13.7\% greater than in Hoffman’s study.\textsuperscript{17} A reason for this could be that in a peri-urban setting, the length of urbanisation improves housing status.\textsuperscript{152} There was a decrease of 14.6\% of participants compared to Hoffman et al (1997) who lived in various forms of informal housing.\textsuperscript{17} Unlike Cooper et al (1991)\textsuperscript{152} results, this sub-study did not find an association between housing status and GBMI or GHPT or GDM. Reasons for this difference are the smaller sample size used and informal housing is difficult to compare as data on serviced informal houses was not collected in a similar way.
Electricity was provided to 9% more of the participants, than was reported in the SADHS in 2003. In the SADHS there was a large difference between rural and urban settlements with regards to the access to electricity. In this sub-study, no relationship was found between GBMI, GHPT or GDM and electricity. This differed from the YENZA study, where high BMI and high blood pressure were associated with having access to electricity. The difference in results could again be because of a smaller sample size and the YENZA study was conducted in relatively less urbanised population.

An increase in both water access and sanitation was found in the sub-study compared to other studies. This is in agreement with the increased piped water that has been created in peri-urban settlements. More than a third (35%, n=72) of the participants used a public toilet. It is not possible to compare this figure with other studies, as they have not separated private and public toilets. The number of bucket and pit latrines seems to have decreased, but the number of people who have no sanitation at all is 1% greater than the SADHS statistics. These figures show an increase of sanitation services to the more formal structures which will hopefully have an impact on health. No relationship was found between water source or type of toilet and GBMI or GHPT or GDM.

The prevalence (7.8%, n=16) of smoking in this sub-study was comparable to the YENZA study, but double the number was found in a study conducted by Steyn et al (1997). However, Steyn et al’s study sample size was almost double that of the sub-study and they looked at four different South African urban cities as opposed to one peri-urban settlement. Health promotion and awareness of the dangers of smoking is higher in urban areas. Although the number of smokers was small, the following SEV were similar to the smokers in the YENZE study: lower education, increasing age and informal housing. In this sub-study, no significant difference was found between smoking and GBMI and maternal morbidities. This is comparable to the findings by Dode and Santos who found the smoking had a negative association with the development of GDM. However this protective effect could however be due to the lower BMI associated with smoking. However this
protective effect has not been found in other studies, and due to the other harmful side-effects of smoking, it is not recommended during pregnancy.\textsuperscript{69,76}

Marital statistics are difficult to compare as studies categorise marital status in different ways. In South Africa, the customary marriage act came into place in 1998 where traditional African marriages were recognised as valid.\textsuperscript{159} This could explain why the current sub-study’s, marital status statistics are different from those by Hoffman et al (1997)\textsuperscript{17} but comparable to Malhotra (2008).\textsuperscript{9} The results also differ from SADHS, but as mentioned before, the SADHS take into account the whole of South Africa.\textsuperscript{5,9} The present sub-study found that there was a significant difference between single and married participants with regards to their GBMI, but not those living with their partners. The married women had a higher GBMI. This is in agreement with other studies.\textsuperscript{9,160} As with Hoffman’s (1997) study, the current sub-study found no association between marital status and maternal morbidities.\textsuperscript{17}

A significant positive association was found between HIV and GDM. No conclusion can be drawn from this as there were only two participants who developed GDM. A reason for this could be that there is evidence that long term use of anti-retroviral therapy (ARV) causes insulin resistance and diabetes\textsuperscript{161,162}, but there has been inconclusive evidence regarding ARV use and gestational diabetes\textsuperscript{163}. Unfortunately the use of ARV medication was not collected. A larger sample with GDM needs to be investigated. Due to only two participants having TB, there was no association found between TB and GBMI and maternal morbidities.

4.3 Limitations
The sample size for the prediction methods was small. This number was calculated for a power goal of 0.9 and effect size of 0.25. In the future a bigger sample size could be used. In this sub-study pregravid weight was recalled and not actually measured. Studies looking at pregravid weight in poor to middle-income countries tend to rely on self-reporting.\textsuperscript{3} An inaccurate pregravid BMI can lead to small errors in weight-gain calculations.\textsuperscript{3} This pre-gravid weight needs to correlate with the BMI in the first trimester as the first two-month weight gain has been found to be
The average first antenatal visit in the peri-urban setting is during the second trimester and most of the participants may not have had access to a weighing scale before their first visit. The recalled pregravid weight may therefore not be reliable.

The participants were not informed of the distinction between GHPT and pre-eclampsia, therefore the two different morbidities could not be separated in the analysis. No participants under the age of 18 were included in the study and therefore the sub-study. One in ten women aged between 15-19 years has had at least one child. Teenage pregnancies are at a higher risk for the following adverse birth outcomes; LBW, premature infants, smaller length and head-circumference. There was inter-variable reliability as all infant anthropometric measurements (birth weight, length and HC) were obtained from the clinic card and maternal weight and height was measured by study trained data-collectors. Most of the information was from participant’s memory recollection. Quality of the data is therefore variable.
CHAPTER 5
CONCLUSIONS AND RECOMMENDATIONS
5.1 CONCLUSIONS:

From the findings of this study there were some promising results, but it is still unclear as to which method is the most appropriate to predict adverse birth outcomes and maternal morbidity. There was a significant positive association between the GRS method and head circumference and the amount of time a baby spent in hospital. The GBMI and GRS methods have previously been used successfully to help improve maternal and child mortality rates in South America. It is therefore recommended that these once-off methods be repeated in a larger sample size in the black African population to see if there are more parameters that could be predicted and if their prediction strength improves. The GBMI and GRS methods could be useful and practical tools to use in a peri-urban setting to aid in identifying high risk pregnancies. It has been found that weight is measured in the majority (range = 96.8 – 97.2%) of antenatal clinics, whilst height is not measured uniformly (range = 61.5 – 90.4%) across South Africa. With appropriate installation of equipment and training the methods are relatively easy and cost-effective to implement. Due to the fact that the IOM method is more reliable when calculated in early pregnancy, it would probably not be appropriate to use in the black African peri-urban population. Both the GBMI and GRS methods would be more suitable as previously, they have been able to assess risk at a later stage in pregnancy. This would be more suitable for the average first attendance of an antenatal clinic appointment in a peri-urban area. If a pregnant woman is classified in a higher risk category, more antenatal appointments can be scheduled and more attention can be given before, during and after the birth. Appropriate medical and nutritional advice can also be given to pregnant women to improve both their own and their infants’ birth outcomes.

This investigation of pregnant women in a peri-urban setting has provided some evidence for an association between GBMI and several SEV (age, height, marital status, parity, employment, income and HIV status). There was no evidence for an association with other SEV (smoking, education, household member count, housing type, water source, toilet type and TB status). No association was found between
GHPT and any of the SEV. Although there was a borderline significance between GHPT and age (p<=0.07). There were too few participants who had GDM to analyse the results. Women who were older, shorter, married, had more previous pregnancies, HIV negative and had a higher socio-economic status, tended to have a greater GBMI. This can lead to adverse birth outcomes and increases the risk of women developing maternal morbidities and other chronic diseases later in their lives. Optimal nutrition and health promotion strategies targeting women with these specific SEV before conception should be implemented to help reduce the risk of morbidities developing during and after pregnancy.

In conclusion, there was no significant difference found between the three different prediction methods. The GRS prediction method accurately predicted two birth outcomes but no maternal morbidities. A correlation was found between various socioeconomic variables and gestational BMI. No correlation was found between socioeconomic variables and maternal morbidities.

5.2 RECOMMENDATIONS

As stated before previously, it is recommended that both the GBMI and GRS methods are looked at in a bigger sample size. It may also be beneficial to gain access to the participants' medical records to see actual blood results as most of the biochemical information was self-reported. Women with the SEV that have been found to be associated with a greater GBMI should be monitored more carefully at antenatal clinics and during and after labour to help improve maternal and child mortality and maternal morbidity rates.
CHAPTER 6
REFERENCES
6.1 REFERENCES


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CHAPTER 7
APPENDICES
Section 1. Interview Identification

1.1 Interviewer code

Please enter your interviewer code:

Expects a numeric response (required)

1.2 Neighbourhood code

Please enter the neighbourhood code:

Expects a single line text response (required)

1.3 Date of Interview

Please confirm the date of this interview:

Expects a date response (required)

1.4 Time of Interview

Please confirm the time of this interview:

Expects a time response (required)

1.5 Participant ID

Please enter the participants unique identifier code:

Expects a valid GS1 identifier (required)

Section 2. Informed Consent

2.1 Informed consent granted

Was the informed consent form explained and accepted?

Expects a single option response (required)

- Yes [1]
- No [2]

Branches
If response Equals 'Yes [1]' then skip to QG Prompt (3.1)
If response Equals 'No [2]' then skip to Home visits (2.2)

2.2 Home visits

If your neighbourhood is one where a Mentor Mother is working, would you still like to recieve home visits even though you have chosen not to participate in the research interviews?

Expects a single option response (required)

- Yes [1]
- No [2]

Branches
If response Equals 'No [2]' then skip to End (13.2)
If response Equals 'Yes [1]' then skip to Expected Birth Date No ICF (13.1)
Section 3. Participant Demographics

3.1 GG Prompt

Thank you for participating in this interview. I will start by asking you some general questions about yourself.

3.2 Identity Document

Do you have an ID book?

Expects a single option response (required)

- Yes [1]
- No [2]
- Decline to answer [91]

3.3 Mother’s age

How old are you (in completed years)?

Expects a numeric response (required)

3.4 Mother’s date of birth

What is your date of birth?

Expects a date response (required)

3.5 Mother’s home language

What is your home language?

Expects a single option response (required)

- English [1]
- IsiZulu [2]
- IsiXhosa [3]
- Other [95]
- Decline to answer [91]

3.6 Participant education

What is the highest level of education you have completed?

Expects a single option response (required)

- No schooling [0]
- Grade 1 / Sub A [1]
- Grade 2 / Sub B [2]
- Grade 3 / Std 1 [3]
- Grade 4 / Std 2 [4]
- Grade 5 / Std 3 [5]
- Grade 6 / Std 4 [6]
- Grade 7 / Std 5 [7]
- Grade 8 / Std 6 [8]
- Grade 9 / Std 7 [9]
- Grade 10 / Std 8 [10]
- Grade 11 / Std 9 [11]
- Grade 12 / Matric [12]
- Post Matric Certificate / Diploma [13]
- Degree [14]
- Decline to answer [91]
3.7 Marital status

Are you currently single or married (in any form)?

- Single [1]
- Married [2]
- Not married but living together [3]
- Decline to answer [91]

3.8 Favourite Colour

What is your favourite colour?

- 

Section 4. Household Overview

4.1 Household Overview Prompt

Thank you. Now I would like to ask you a few questions about the people who live with you.

4.2 Participant lives with others

Do you live with others in your household (people who sleep in the household more than 2 nights each week)?

- Yes [1]
- No [2]
- Decline to Answer [91]

4.3 HH Member Count

How many other people, including yourself and all adults and children, live in the household? Please note that, if there are more than 15 members in the household, you need to only enter 15 here and capture the first 15 members.

Constraints

Response must be Greater Than or Equal '1'
Response must be Less Than or Equal '15'

4.4 Household Member Prompt

The next section will capture some details on the members of this household.

Repeat this section for value of HH Member Count (4.3)

Section 5. Household People Count

5.1 HH Member Name

What is this member's name?

- 

5.2 HH Member Age

What is HH Member Name (5.1)'s age?

- 

...
Section 6. Demographic Information about Housing

6.1 Housing Prompt

In this next section, the questions are about the house where you live.

6.2 Housing description

What best describes your housing?

- Formal brick structure on a separate yard [1]
- Pre fab dwelling/wendy house in back yard [2]
- Informal dwelling/Shack in backyard [3]
- Informal dwelling/Shack not in backyard, e.g. in an informal/squatter settlement [4]
- Hostel [5]
- Decline to answer [91]

6.3 Water source

What is the main source of drinking water?

- Water in the home [1]
- Water on the premises [2]
- Water from a community tap / public tank [3]
- Water from a river [4]
- Decline to answer [91]

6.4 Household toilet

What toilet facilities does your household have?

- Flush toilet on the premises [1]
- Bucket toilet [2]
- Public toilet [3]
- Pit latrine [4]
- None [5]
- Other [95]
- Decline to answer [91]

6.5 Electricity

Do you have electricity in your household?

- Yes [1]
- No [2]
- Decline to answer [91]

6.6 Cooking fuel

What is your main source of fuel for cooking?

Expects a single option response (required)
6.7 Household items

Does your household have any of the following items that I will read off?

Requires multiple selected options (required)

- Stove (coal, electric, primus, gas) [1]
- Cell phone [2]
- Bicycle [3]
- Radio [4]
- Refrigerator [5]
- Television [6]
- Car in working condition [7]
- Telephone (landline) [8]
- Computer [9]
- Internet (computer) [10]
- Internet (cell phone) [11]
- Decline to answer [91]
- None of these [12]

Section 7. Income and Employment

7.1 Income Prompt

Now I would like to ask you a few questions about employment and income.

7.2 Participant employed

Are you employed?

Requires a single option response (required)

- Part time [1]
- Full time [2]
- Temporary/casual work [3]
- No [4]
- Self employed [5]
- Decline to answer [91]

7.3 Household income sources

What are the sources of income for the household?

Requires multiple selected options (required)

- Regular income [1]
- Irregular income [2]
- Self employment [3]
- Contribution from others [4]
- Retirement pension [5]
- State pension [6]
- Disability grant [7]
- Child support grant [8]
7.4 Household monthly income

What is the average household monthly income?

Expects a single option response (required)

- 0 to 499 Rand [1]
- 500 to 1000 [2]
- 1001 to 2000 [3]
- 2001 to 5000 [4]
- 5001 to 8000 [5]
- 8000 and above [6]
- Don’t know [99]
- Decline to answer [91]

7.5 Participant days of hunger

How many days in the passed week have you gone hungry? (By this I mean days when you felt you didn’t have enough to eat)

Expects a numeric response (required)

Constraints

Response must be Less Than or Equal ‘7’

7.6 Household children hunger

How many days in the last week have any of the children gone hungry? (By this I mean days when you felt that your children needed to eat more.)

Expects a numeric response (required)

Constraints

Response must be Less Than or Equal ‘7’

Section 8. This Pregnancy

8.1 Pregnancy Prompt

Now I have a few short questions about your future baby.

8.2 Baby due date

What is the due date for your baby?

Expects a date response (required)

8.3 Weeks pregnant

How many weeks pregnant are you?

Expects a numeric response (required)

Constraints

Response must be Less Than or Equal ‘48’

8.4 Booked at Antenatal Clinic
Section 9. General Health - Participant

9.1 General Health Prompt

Thank you. The next few questions are about your general health, relating to illnesses such as Diabetes, Disability and TB.

9.2 Participant Height

Please record the participants height (m):

Expect a decimal response (required)

Constraints
Response must be Less Than or Equal '3'
Response must be Greater Than or Equal '0.5'

9.3 Participant Weight

Please record the participants weight (kg):

Expect a decimal response (required)

Constraints
Response must be Greater Than or Equal '30'
Response must be Less Than or Equal '250'

9.4 Chronic illness

Are you currently diagnosed with any of the following chronic illnesses?

Expect multiple selected options (required)

- Diabetes [1]
- Hypertension [2]
- Disability [3]
- Asthma [4]
- None [5]
- Other [95]
- Decline to answer [91]

9.5 Ever Tested TB

Have you ever tested for TB?

Expect a single option response (required)

- Yes [1]
- No [2]
- Decline to Answer [91]

9.6 Previous TB result

Did you ever test positive for TB?

Expect a single option response (required)

- Yes [1]
- No [2]
- Decline to answer [91]
9.7 Previous treatment TB

Did you ever receive treatment when you tested positive for TB?

Expects a single option response (required)

- Yes [1]
- No [2]
- Decline to answer [91]

9.8 TB test this pregnancy

During this pregnancy have you tested for TB?

Expects a single option response (required)

- Yes [1]
- No [2]
- Decline to answer [91]

Branches

If response Not Equal "Yes [1]" then skip to HH member TB test (9.11)

9.9 Current TB test result

During this pregnancy, did you test positive for TB?

Expects a single option response (required)

- Yes [1]
- No [2]
- Decline to answer [91]

Branches

If response Not Equal "Yes [1]" then skip to HH member TB test (9.11)

9.10 Current treatment TB

Are you currently receiving treatment for TB?

Expects a single option response (required)

- Yes [1]
- No [2]
- Decline to Answer [91]

9.11 HH member TB test

During your pregnancy has anybody ELSE in the household tested for TB?

Expects a single option response (required)

- Yes [1]
- No [2]
- Don't know [99]
- Decline to answer [91]

Branches

If response Not Equal "Yes [1]" then skip to Mental Health Prompt (10.1)

9.12 HH member current treatment

Are they currently receiving treatment for TB?

Expects a single option response (required)

- Yes [1]
- No [2]
- Don't know [99]
- Decline to answer [91]
Section 10. Mental Health

10.1 Mental Health Prompt

Now I have some questions to ask about your feelings over the last week. Please state the answer which comes closest to how you have felt IN THE PAST 7 DAYS, not just how you feel today.

10.2 Laugh

I have been able to laugh and see the funny side of things.

Expect a single option response (required)

- As much as I always could [0]
- Not quite so much now [1]
- Definitely not so much now [2]
- Not at all [3]

10.3 Enjoyment

I have looked forward with enjoyment to things.

Expect a single option response (required)

- As much as I ever did [0]
- Rather less than I used to [1]
- Definitely less than I used to [2]
- Hardly at all [3]

10.4 Self Blame

I have blamed myself unnecessarily when things went wrong.

Expect a single option response (required)

- Yes, most of the time [3]
- Yes, some of the time [2]
- Not very often [1]
- No, never [0]

10.5 Anxious/worry

I have been anxious or worried for no good reason.

Expect a single option response (required)

- No, not at all [0]
- Hardly ever [1]
- Yes, sometimes [2]
- Yes, very often [3]

10.6 Panicky

I have felt scared or panicky for no very good reason.

Expect a single option response (required)

- Yes, quite a lot [3]
- Yes, sometimes [2]
- No, not much [1]
- No, not at all [0]

10.7 Things piled up

Things have been getting on top of me.

Expect a single option response (required)

- Yes, most of the time I haven’t been able to cope at all [3]
- Yes, sometimes I haven’t been coping as well as usual [2]
- No, most of the time I have coped quite well [1]
- No, I have been coping as well as ever [0]
10.8 Difficulty sleeping

I have been so unhappy that I have had difficulty sleeping

Expects a single option response (required)

- Yes, most of the time [3]
- Yes, sometimes [2]
- Not very often [1]
- No, not at all [0]

10.9 Sad/miserable

I have felt sad or miserable

Expects a single option response (required)

- Yes, most of the time [3]
- Yes, sometimes [2]
- Not very often [1]
- No, not at all [0]

10.10 Crying

I have been so unhappy that I have been crying.

Expects a single option response (required)

- Yes, most of the time [3]
- Yes, quite often [2]
- Only occasionally [1]
- No, never [0]

10.11 Self harm

The thought of harming myself has occurred to me.

Expects a single option response (required)

- Yes, quite often [3]
- Sometimes [2]
- Hardly ever [1]
- Never [0]

10.12 General Health Questionnaire (GHQ) Prompt

We would like to know how your health has been in general OVER THE PAST FEW WEEKS. Please answer ALL the questions simply by stating which answer most closely applies to you OVER THE PAST FEW WEEKS. Remember that we want to know about PRESENT AND RECENT (Interviewer prompt: over the past few weeks since the month and dates you want to discuss) complaints, not those you had in the past. It is important that you try to answer all the questions.

10.13 GHQ Concentrate

Have you been able to concentrate on whatever you're doing?

Expects a single option response (required)

- Better than usual [3]
- Same as usual [2]
- Less than usual [1]
- Much less than usual [0]

10.14 GHQ Lost sleep

Have you recently lost much sleep over worry?

Expects a single option response (required)

- Not at all [3]
- No more than usual [2]
- Rather more than usual [1]
10.15 GHQ Useful part

Have you recently felt that you are playing a useful part in things?

Expect a single option response (required)

- More so than usual [3]
- Same as usual [2]
- Less useful than usual [1]
- Much less useful [0]

10.16 GHQ Decisions

Have you recently felt capable of making decisions about things?

Expect a single option response (required)

- More so than usual [3]
- Same as usual [2]
- Less so than usual [1]
- Much less capable [0]

10.17 GHQ Under strain

Have you recently felt constantly under strain?

Expect a single option response (required)

- Not at all [3]
- No more than usual [2]
- Rather more than usual [1]
- Much more than usual [0]

10.18 GHQ Unable overcome difficulties

Have you recently felt you couldn’t overcome your difficulties?

Expect a single option response (required)

- Not at all [3]
- No more than usual [2]
- Rather more than usual [1]
- Much more than usual [0]

10.19 GHQ Enjoy activities

Have you recently been able to enjoy your normal day-to-day activities?

Expect a single option response (required)

- More than usual [3]
- Same as usual [2]
- Less so than usual [1]
- Much less than usual [0]

10.20 GHQ Face problems

Have you recently been able to face up to your problems?

Expect a single option response (required)

- More than usual [3]
- Same as usual [2]
- Less able than usual [1]
- Much less able [0]

10.21 GHQ Unhappy/depressed

Have you recently been feeling unhappy and depressed?

Expect a single option response (required)

- Not at all [3]
10.22 GHQ Loosing confidence

Have you recently been losing confidence in yourself?
Expect a single option response (required)
- Not at all [3]
- No more than usual [2]
- Rather more than usual [1]
- Much more than usual [0]

10.23 GHQ Worthless person

Have you recently been thinking of yourself as a worthless person?
Expect a single option response (required)
- Not at all [3]
- No more than usual [2]
- Rather more than usual [1]
- Much more than usual [0]

10.24 GHQ Reasonably happy

Have you recently been feeling reasonably happy, all things considered?
Expect a single option response (required)
- More than usual [3]
- About the same as usual [2]
- Less so than usual [1]
- Much less than usual [0]

Section 11. Social Support

11.1 Social Support Prompt

Next are some questions about friends and relatives who are available to you for support

11.2 Close friends and relatives

How many close friends and relatives do you have? By this, I mean people you feel at ease with and can talk with about what is on your mind.
Expect a numeric response (required)

11.3 Frequency Contact

In this past month, approximately how many times have you had contact with friends or relatives (including visits, phone calls, sms, and social gatherings)?
Expect a numeric response (required)

11.4 Participation in groups or organisations

Which (if any) of the following organisations do you participate in?
Expect multiple selected options (required)
- A temple/ church [1]
- Community events [2]
- Community meetings [3]
- Support group [4]
- AIDS education group [5]
11.5 Recreation time

In the past month, how often did you do enjoyable or relaxing things just for yourself such as watching TV, going to church, having your hair done, singing dancing?

Expects a single option response (required)

- Never [1]
- Once or twice a month [5]
- Once or twice a week [2]
- Several times a week [3]
- Daily [4]
- Decline to answer [91]
- Don’t know [99]

11.6 Practical support

How many times in the past week has someone provided you with practical support? (E.g. money for taxi fare, helping with chores, childcare)

Expects a numeric response (required)

11.7 Current partner

Do you have a current partner?

Expects a single option response (required)

- Yes [1]
- No [2]
- Decline to answer [91]

Branches

If response Not Equal "Yes [1]" then skip to Trust talk to Mother (11.11)

11.8 Trust and share with partner

Can you trust, talk to and share your feelings with your husband / partner?

Expects a single option response (required)

- Never [1]
- Sometimes [2]
- Always [3]
- Decline to answer [91]

11.9 Turn to partner in difficulty

Can you lean on and turn to your husband/partner in times of difficulty?

Expects a single option response (required)

- Never [1]
- Sometimes [2]
- Always [3]
- Decline to answer [91]

11.10 Partner practical help

Does he give you practical help?

Expects a single option response (required)

- Never [1]
- Sometimes [2]
11.11 Trust, talk to Mother

Can you trust, talk frankly and share your feelings with your mother?

Expect a single option response (required)

- Never [1]
- Sometimes [2]
- Always [3]
- Mother is deceased [4]
- Decline to answer [91]

Branches
If response Equals "Mother is deceased [4]" then skip to Trust, talk to father (11.14)

11.12 Turn to mother in difficulty

Can you lean on and turn to your mother in times of difficulty?

Expect a single option response (required)

- Never [1]
- Sometimes [2]
- Always [3]
- Mother is deceased [4]
- Decline to answer [91]

11.13 Mother practical help

Does your mother give you practical help?

Expect a single option response (required)

- Never [1]
- Sometimes [2]
- Always [3]
- Mother is deceased [4]
- Decline to answer [91]

11.14 Trust, talk to father

Can you trust, talk frankly and share your feelings with your father?

Expect a single option response (required)

- Never [1]
- Sometimes [2]
- Always [3]
- Father is deceased [4]
- Decline to answer [91]

Branches
If response Equals "Father is deceased [4]" then skip to Father Prompt (12.1)

11.15 Turn to father in difficulty

Can you lean on and turn to your father in times of difficulty?

Expect a single option response (required)

- Never [1]
- Sometimes [2]
- Always [3]
- Father is deceased [4]
- Decline to answer [91]

11.16 Father practical help

Does your father give you practical help?
Section 12. Father of the Child

12.1 Father Prompt

Thank you. I would now like to ask you some questions about the father of this child.

12.2 Fathers knowledge of pregnancy

Have you told the father of this baby about the pregnancy?

Expects a single option response (required)
- Yes [1]
- No [2]
- Decline to answer [91]

12.3 Fathers acknowledgement of baby

Will the father introduce (acknowledge) this baby to his family?

Expects a single option response (required)
- Yes [1]
- No [2]
- Don't know [99]
- Decline to answer [91]

12.4 Fathers financial support

Is the father of this baby supporting you financially?

Expects a single option response (required)
- Yes [1]
- No [2]
- Decline to Answer [91]

12.5 Father staying with you

Is the father of this child staying with you?

Expects a single option response (required)
- Yes [1]
- No [2]
- Decline to answer [91]

12.6 Father opinions on feeding

Does the baby's father have any opinions about how to feed the baby?

Expects a single option response (required)
- Yes [1]
- No [2]
- Don't Know [99]
- Decline to answer [91]

Branches
If response Not Equal "Yes [1]" then skip to End Part 1 (13.3)
Section 13. End of Survey

13.1 Expected Birth Date No ICF

What is the due date for your baby?

Expect a date response (required)

13.2 End

You have reached the end of the survey. You can go back and review previous responses or select Next to complete the section.

Prerequisites
Skip when Informed consent granted (2.1) Not Equal "Yes [1]"

13.3 End Part 1

You have reached the end of the first part of the survey. You can go back and review previous responses or select Next to complete the section. Once you have completed this section, please continue with Part 2 of the Baseline Survey.
Section 1. Interview Identification

1.1 Interviewer code

Please enter your interviewer code:

Expects a numeric response (required)

1.2 Neighbourhood code

Please enter the neighbourhood code:

Expects a single line text response (required)

1.3 Date of Interview

Please confirm the date of this interview:

Expects a date response (required)

1.4 Time of Interview

Please confirm the time of this interview:

Expects a time response (required)

1.5 Participant ID

Please enter the participants unique identifier code:

Expects a valid GS1 identifier (required)

Section 2. Relationship Status

2.1 Current Partner BS2

Do you have a current partner?

Expects a single option response (required)

- Yes [1]
- No [2]
- Decline to answer [01]

Section 3. Use of Tobacco & Other Substances

3.1 Smoking Prompt

The next few questions are about smoking.

3.2 Use of Tobacco

Do you use tobacco?

Expects a single option response (required)

- Yes [1]
3.3 Tobacco Frequency

In the past 3 months, on how many days did you use tobacco?

Expects a numeric response (required)

Constraints
Response must be Greater Than or Equal '0'
Response must be Less Than or Equal '92'

3.4 Use of Dagga

Do you use dagga?

Expects a single option response (required)

- Yes [1]
- No [2]
- Decline to answer [91]

Branches
If response Not Equal 'Yes' then skip to Use of Tik (3.6)

3.5 Dagga Frequency

On how many days in the past 3 MONTHS did you use dagga

Expects a numeric response (required)

Constraints
Response must be Greater Than or Equal '0'
Response must be Less Than or Equal '92'

3.6 Use of Tik

Do you use Tik?

Expects a single option response (required)

- Yes [1]
- No [2]
- Decline to answer [91]

Branches
If response Not Equal 'Yes' then skip to Type of traditional medicines used (4.1)

3.7 Tik Frequency

On how many days in the past 3 MONTHS did you use Tik?

Expects a numeric response (required)

Constraints
Response must be Greater Than or Equal '0'
Response must be Less Than or Equal '92'

Section 4. Use of Traditional Medicines

4.1 Type of traditional medicines used

Please tell us which of the following, if any, you have used in the time since you became pregnant.

Expects multiple selected options (optional)

- Enemas [1]
- Traditional vitamins or supplements in liquid [2]
Section 5. Use of Alcohol

5.1 Alcohol Prompt

Now Id like to ask you a few more questions about drinking alcohol. I know that sometimes these can be sensitive questions, but please remember that your answers will be kept secret and no one will know that these answers belong to you. Your name will not appear on any research forms and we will not share your answers with the anyone other than research staff. We are asking many women these important questions and thank you for doing your best to answer them all honestly.

5.2 Weeks pregnant when found out about pregnancy

How many weeks pregnant were you when you found out you were pregnant?

Expects a numeric response (required)

5.3 Alcohol in pregnancy before knowledge of pregnancy

How often did you use alcohol in the month before you found out you were pregnant? [INTERVIEWER WILL USE A LOCAL TYPICAL CUP TO VISUALLY SHOW SIZE OF 1 DRINK]

Expects a single option response (required)

- Never [1]
- Less than once a month [2]
- Once a month [3]
- 2 to 3 times a month [4]
- Once a week [5]
- 2 times a week [6]
- 3 to 4 times a week [7]
- Nearly every day [8]
- Every day [9]
- Decline to answer [91]

Branches
If response Equals 'Never [1]' then skip to Alcohol during pregnancy after learning of pregnancy. (5.7)
If response Equals 'Decline to answer [91]' then skip to Alcohol during pregnancy after learning of pregnancy. (5.7)

5.4 Alcohol per day on days when used alcohol before knowledge of pregnancy

During the month before you found out you were pregnant, counting all types of alcohol combined, how many drinks did you USUALLY have on days when you drank alcohol?

Expects a single option response (required)

- 1 or 2 [1]
- 3 or 4 [2]
- 5 or 6 [3]
- 7,8 or 9 [4]
- 10 or more [5]
- Decline to answer [91]

5.5 Frequency of four or more drinks per day before knowledge of pregnancy

During the month before you found out you were pregnant, about how often did you drink FOUR OR MORE drinks in a single day?

Expects a single option response (required)
5.6 Frequency of three or more drinks per day before knowledge of pregnancy

During the month before you found out you were pregnant, about how often did you drink THREE OR MORE drinks in a single day?

Expect a single option response (optional)

- Never [1]
- Less than once a month [2]
- Once a month [3]
- 2 to 3 times a month [4]
- Once a week [5]
- 2 times a week [6]
- 3 to 4 times a week [7]
- Nearly every day [8]
- Every day [9]
- Decline to answer [91]

5.7 Alcohol during pregnancy after learning of pregnancy.

Now that you know you are pregnant, about how often do you drink ANY alcoholic beverage?

Expect a single option response (optional)

- Never [1]
- Less than once a month [2]
- Once a month [3]
- 2 to 3 times a month [4]
- Once a week [5]
- 2 times a week [6]
- 3 to 4 times a week [7]
- Nearly every day [8]
- Every day [9]
- Decline to answer [91]

Branches
If response Equals 'Never [1]' then skip to Previous Pregnancies Prompt (6.1)
If response Equals 'Decline to answer [91]' then skip to Previous Pregnancies Prompt (6.1)

5.8 Alcohol per day on days when used alcohol after knowledge of pregnancy

Now that you know you are pregnant, counting all types of alcohol combined, how many drinks do you USUALLY have on days when you drink alcohol?

Expect a single option response (required)

- 1 or 2 [1]
- 3 or 4 [2]
- 5 or 6 [3]
- 7, 8 or 9 [4]
- 10 or more [5]
- Decline to Answer [91]

5.9 Frequency of four or more drinks per day after knowledge of pregnancy
Now that you know you are pregnant, about how often do you drink FOUR or MORE drinks in a single day?

Expect a single option response (optional)

- Never [1]
- Less than once a month [2]
- Once a month [3]
- 2 to 3 times a month [4]
- Once a week [5]
- 2 times a week [6]
- 3 to 4 times a week [7]
- Nearly every day [8]
- Every day [9]
- Decline to answer [91]

5.10 Frequency of three or more drinks per day after knowledge of pregnancy

Now that you know you are pregnant, about how often do you drink THREE or MORE drinks in a single day?

Expect a single option response (optional)

- Never [1]
- Less than once a month [2]
- Once a month [3]
- 2 to 3 times a month [4]
- Once a week [5]
- 2 times a week [6]
- 3 to 4 times a week [7]
- Nearly every day [8]
- Every day [9]
- Decline to answer [91]

5.11 Number drinks to feel high

How many drinks does it take to make you feel high?

Expect a numeric response (required)

5.12 Friend/relatives complained about drinking

Have close friends or relatives worried or complained about your drinking?

Expect a single option response (required)

- Yes [1]
- No [2]
- Decline to answer [91]

5.13 Alcohol upon waking

Do you sometimes take a drink in the morning when you first get up?

Expect a single option response (optional)

- Yes [1]
- No [2]
- Decline to Answer [91]

5.14 Memory loss with alcohol

Has a friend or family member ever told you about things you said or did while you were drinking that you could not remember?

Expect a single option response (optional)

- Yes [1]
- No [2]
- Decline to answer [91]
5.15 Need to cut down drinking

Do you sometimes feel the need to cut down on your drinking?
Expects a single option response (optional)
<table>
<thead>
<tr>
<th></th>
<th>Yes [1]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No [2]</td>
</tr>
<tr>
<td></td>
<td>Decline to answer [91]</td>
</tr>
</tbody>
</table>

6. Section 6. Reproductive Health

6.1 Previous Pregnancies Prompt

Thank you. The next few questions are about any previous pregnancies and children you might have had.

6.2 Total number pregnancies

How many times have you been pregnant, including this pregnancy?
Expects a numeric response (required)

Constraints
Response must be Greater Than or Equal '1'
Branches
If response Equals '1' then skip to Previous of STI (6.5)

6.3 Number live births

How many live babies have you given birth to?
Expects a numeric response (required)

Constraints
Response must be Less Than or Equal 'Number live births (6.3)'
Response must be Greater Than or Equal '0'

6.4 Previous LBW babies

How many (if any) of the babies you have given birth to were low birth weight (weighed less than 2500g at birth)?
Expects a numeric response (required)

Constraints
Response must be Less Than or Equal 'Number live births (6.3)'
Response must be Greater Than or Equal '0'

6.5 Previous treat of STI

Have you ever received treatment for an STI?
Expects a single option response (required)
<table>
<thead>
<tr>
<th></th>
<th>Yes [1]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No [2]</td>
</tr>
<tr>
<td></td>
<td>Decline to answer [91]</td>
</tr>
</tbody>
</table>

6.6 Current Pregnancy Prompt

Now I have a further few questions about this baby you are carrying now.

6.7 Attempt to terminate pregnancy

Have you ever tried to terminate this pregnancy?
Expects a single option response (required)
<table>
<thead>
<tr>
<th></th>
<th>Yes [1]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No [2]</td>
</tr>
<tr>
<td></td>
<td>Decline to answer [91]</td>
</tr>
</tbody>
</table>
6.8 Baby planned

Was the baby planned? (Note: planned is defined as intending or planning on her own or with partner to have a child.)

- Yes [1]
- No [2]
- Decline to Answer [91]

6.9 Treatment of STI during this pregnancy

Have you received treatment for an STI during this pregnancy?

- Yes [1]
- No [2]
- Decline to answer [91]

Section 7. Reproductive Health – HIV & STI’s

7.1 HIV Prompt

Now I would like to ask you some questions regarding HIV.

7.2 Tested for HIV ever

Have you been tested for HIV?

- Yes [1]
- No [2]
- Decline to answer [91]

Branches

If response Not Equal 'Yes [1]' then skip to Previous Partners Prompt (8.1)

7.3 Date last tested

When were you last tested for HIV?

- Date response (required)

7.4 HIV test prompt

The next question is about the result of your HIV test. I know that this is a very sensitive question. Please be reassured that your answer will be kept strictly confidential and will never be linked to your name or your personal details in any way whatsoever. No one will ever know the answer to this question, but it will greatly benefit this project if you are able to share this information with us.

7.5 HIV test result

What was the result of your test?

- HIV Positive [1]
- HIV Negative [2]
- Decline to answer [91]

Section 8. Partnerships – Previous Sexual behaviour

8.1 Previous Partners Prompt

The next few questions are about sexual partners that you have had in the past. Again, please be reassured that this information will remain strictly
8.2 Lifetime sexual partners
In your lifetime, with how many different people have you had sex? If you can't recall the exact number, please give a best guess.

Expect a numeric response (required)

Constraints
- Response must be Greater Than or Equal '0'

8.3 Sexual partners in previous year
How many persons have you had sex with in the last year?

Expect a numeric response (required)

Constraints
- Response must be Less Than or Equal 'Lifetime sexual partners (8.2)'
- Response must be Greater Than or Equal '0'

8.4 Concurrent sexual partners past year
Was there a period in the last year when you had two or more sexual partners in the same time period (Note To interviewer: More than one partner at a concurrent time period not including group sex)

Expect a single option response (required)
- Yes [1]
- No [2]
- Decline to answer [91]

8.5 Knowledge of partners HIV status past year
Of the partners you have had sex with in the past year, how many do you know the HIV status of?

Expect a numeric response (required)

Constraints
- Response must be Less Than or Equal 'Sexual partners in previous year (8.3)'
- Response must be Greater Than or Equal '0'

Branches
- If response 'Equals 0' then skip to Any partners engaged in HIV status discussion past year (8.7)

8.6 Number partners HIV+ past year
How many of your sexual partners in the past year were HIV+?

Expect a numeric response (required)

Constraints
- Response must be Less Than or Equal 'Sexual partners in previous year (8.3)'
- Response must be Greater Than or Equal '0'

8.7 Any partners engaged in HIV status discussion past year
Of the Sexual partners in previous year (8.3) sexual partners, how many did you talk to about HIV?

Expect a numeric response (required)

Constraints
- Response must be Less Than or Equal 'Sexual partners in previous year (8.3)'
- Response must be Greater Than or Equal '0'

8.8 Knowledge of sexual partners other sexual relationships last year
Of the partners in the last year, how many do you think were also involved with other women at the same time as you?

Expect a numeric response (required)
Section 9. Partnerships – Current Sexual Behaviour

9.1 Current Partners Prompt

In the following section I will be asking you questions about your most recent sexual partner or partners. Recent is defined as anyone you have had sex with in the last three months.

9.2 Sexual partners last 3 months

How many people have you had sex with in the past 3 months?

Expects a numeric response (required)

Constraints
 Response must be Greater Than or Equal '0'
 Response must be Less Than or Equal 'Sexual partners in previous year (8.3)'

9.3 Concurrent sexual partners last 3 months

Was there a period in the last 3 months when you had two or more sexual partners in the same time period (Note to interviewer: more than one partner at a concurrent time period not including group sex).

Expects a single option response (required)

- Yes [1]
- No [2]
- Decline to answer [91]

Repeat this section for value of Sexual partners last 3 months (9.2)

Section 10. Partnerships - Current Sexual Behaviour (Part 2)

10.1 Partner HIV Status

As far as you know, does this partner have HIV?

Expects a single option response (required)

- Yes [1]
- No [2]
- Don’t know [99]
- Decline to answer [91]

10.2 Discussed Own Status with Partner

Have you discussed your status with this partner?

Expects a single option response (required)

- Yes [1]
- No [2]
- Decline to answer [91]

10.3 Asked Partner to Test

Have you asked this partner to go for an HIV test?

Expects a single option response (required)

- Yes [1]
- No [2]
- Decline to answer [91]
10.4 Partner had Other Partners

Do you think that this partner is/was also involved with other women at the same time as you?

Expect a single option response (required)

- Yes [1]
- No [2]
- Don’t know [99]
- Decline to answer [91]

10.5 Partner Condom Use

Of the last 10 times you had sex, how many times out of 10 did you use a condom?

Expect a single option response (required)

- 0 [0]
- 1 [1]
- 2 [2]
- 3 [3]
- 4 [4]
- 5 [5]
- 6 [6]
- 7 [7]
- 8 [8]
- 9 [9]
- 10 [10]
- Decline to answer [91]

Section 11. Disclosure & Protection

Prerequisites
Skip when HIV test result (7.5) Not Equal ‘HIV Positive [1]’

11.1 Support Prompt

Thank you. The next few questions I will ask about disclosure and support, regarding your HIV status

Prerequisites
Skip when HIV test result (7.5) Not Equal ‘HIV Positive [1]’

11.2 Able to disclose

If you wanted to disclose your HIV status would you be able to?

Expect a single option response (required)

- Yes [1]
- No [2]
- Unsure [99]
- Decline to answer [95]

Prerequisites
Skip when HIV test result (7.5) Not Equal ‘HIV Positive [1]’
Skip when Current Partner BSS (2.1) Not Equal ‘Yes [1]’

11.3 Disclosed to Partner

Have you disclosed you HIV status to your partner?

Expect a single option response (required)

- Yes [1]
- No [2]
- Has no partner [3]
- Decline to answer [91]
11.4 Disclosed to Family

How many family members have you disclosed your HIV Status to?

Expected a numeric response (required)

Constraints

Response must be Greater Than or Equal '0'

Prerequisites

Skip when HIV test result (7.5) Not Equal 'HIV Positive [1]'

11.5 Disclosed to Others

How many people outside your family have you disclosed your HIV Status to?

Expected a numeric response (required)

Constraints

Response must be Greater Than or Equal '0'

Prerequisites

Skip when HIV test result (7.5) Not Equal 'HIV Positive [1]'

11.6 Inform sister of status at delivery

Do you feel confident that you could tell your clinic sister about your HIV status when you go to give birth?

Expected a single option response (required)

- Yes [1]
- No [2]
- Unsure [99]
- Decline to answer [91]

Prerequisites

Skip when HIV test result (7.5) Not Equal 'HIV Positive [1]'

11.7 Prevention of further infection

Now that you know your status how do you plan to protect yourself from being reinfected with HIV?

Expected multiple selected options (required)

- Be faithful [1]
- Use condoms [2]
- Abstain [3]
- Test for HIV [4]
- Nothing [5]
- Other [95]
- Decline to answer [91]

Prerequisites

Skip when HIV test result (7.5) Not Equal 'HIV Positive [1]'

Skip when Current Partner BSS (2.1) Not Equal 'Yes [1]'

11.8 Comfortable talking to partner

Which (if any) of the following do you feel comfortable talking to your partner about?

Expected multiple selected options (required)

- About pregnancy [1]
- About HIV [2]
- About asking for help when you need it [3]
- About speaking up when things are wrong [4]
- About revealing your HIV status [5]
- None of the above [6]
- NOT APPLICABLE, has no partner [7]
- Decline to answer [91]
11.9 Comfortable talking to clinic sister or nurse

Which (if any) of the following do you feel comfortable talking to your clinic sister / nurse about?

Expects multiple selected options (required)

- About pregnancy [1]
- About HIV [2]
- About asking for help when you need it [3]
- About speaking up when things are wrong [4]
- About revealing your HIV status [5]
- None of the above [6]
- Decline to answer [91]

11.10 Comfortable talking to female relative/friend

Which (if any) of the following do you feel comfortable talking to your mother/sister/female relative or female friend about?

Expects multiple selected options (required)

- About pregnancy [1]
- About HIV [2]
- About asking for help when you need it [3]
- About speaking up when things are wrong [4]
- About revealing your HIV status [5]
- None of the above [6]
- Decline to answer [91]

11.11 Conflict due to status

How much conflict has your diagnosis of HIV caused between you and your partner?

Expects a single option response (required)

- None [1]
- A little [2]
- Quite a lot [3]
- A lot of conflict [4]
- Decline to answer [91]

11.12 Conflict in the home

How much conflict is there at home?

Expects a single option response (required)

- None [1]
- A little [2]
- Quite a lot [3]
- A lot of conflict [4]
- Decline to answer [91]

Section 12. Relationships and violence

12.1 Relationship Prompt
The next few questions are about your current relationship with your partner.

12.2 Frequency quarrels

In your current relationship how often would you say that you have quarrelled? Would you say never, rarely, sometimes or often?

- **Never** [1]
- **Rarely** [2]
- **Sometimes** [3]
- **Often** [4]

12.3 Talk about relationship to friend

Do you talk to a friend or relative about problems in your relationship?

- **Yes** [1]
- **No** [2]

12.4 Quality current relationship

Would you say your relationship is it excellent, alright, just ok, or not alright?

- **Excellent** [1]
- **Alright** [2]
- **Just ok** [3]
- **Not alright** [4]

12.5 Violence Prompt

Men often fight with their girlfriends and often these fights get physical. I am going to ask some questions about this because we want to learn more about what women experience in their lives. I want you to speak freely and remember that everything you say will be confidential.

12.6 Slap

In the past 12 months, did your current partner or any other boyfriend slap you or throw something at you which could hurt you? Did this happen many times, a few times, once or did it not happen?

- **Never** [1]
- **Once** [2]
- **Few** [3]
- **Many** [4]

12.7 Shove

In the past 12 months, did your current partner or any other boyfriend push or shove you? Did this happen many times, a few times, once or did it not happen?

- **Never** [1]
- **Once** [2]
- **Few** [3]
- **Many** [4]

12.8 Punch

- **Never** [1]
- **Once** [2]
- **Few** [3]
- **Many** [4]
In the past 12 months, did your current partner or any other boyfriend hit you with a fist or with something else which could hurt you? Did this happen many times, a few times, once or did it not happen?

Expects a single option response (optional)

- Never [1]
- Once [2]
- Few [3]
- Many [4]

12.9 Weapon

In the past 12 months, did your current partner or any other boyfriend threaten to use or actually use a gun, knife or other weapon against you? Did this happen many times, a few times, once or did it not happen?

Expects a single option response (optional)

- Never [1]
- Once [2]
- Few [3]
- Many [4]

12.10 No physical violence confirmation

Is it correct to confirm then that, in the last 12 months, you have not been physically harmed by your current partner or any other boyfriend?

Expects a single option response (required), Default: Yes

- Yes [1]
- No [2]

Branches

If response Equals "Yes [1]" then skip to Antenatal Health Prompt (13.1)

12.11 Willing to Tell Most Recent Date

Are you willing to tell us the most recent date on which you had an argument with your boyfriend that got physical?

Expects a single option response (required)

- Yes [1]
- No [2]

Branches

If response Not Equal "Yes [1]" then skip to Number violent episodes (12.13)

12.12 Most recent violence

When was the most recent time you had an argument with a boyfriend that got physical?

Expects a date response (optional)

12.13 Number violent episodes

In the past 12 months on how many occasions in did you have an argument with any boyfriend that got physical?

Expects a numeric response (required)

12.14 Violence from current partner in previous year

In the past 12 months did you have an argument with your current partner that got physical?

Expects a single option response (required)

- Yes [1]
- No [2]
Section 13. Baseline Knowledge – Antenatal Health

13.1 Antenatal Health Prompt

Now I am going to ask you some questions about antenatal health. While you may not know all the answers to the following questions, please answer each question to the best of your ability.

13.2 Ok to have little alcohol

Statement: It is ok for a pregnant woman to drink a little alcohol to relax.

Expects a single option response (required)

- Agree [1]
- Disagree [2]
- Don't know [3]
- Decline to answer [91]

13.3 Weight gain is healthy

Statement: The more weight a pregnant woman gains in pregnancy, the healthier the baby.

Expects a single option response (required)

- Agree [1]
- Disagree [2]
- Don't know [3]
- Decline to answer [91]

13.4 Vitamins Prompt

Thank you. Now we have a question about any vitamins or mineral supplements you might be taking.

13.5 V&M Supplementation

Are you taking any of the following during this pregnancy?

Expects multiple selected options (required)

- Multivitamin [1]
- Folic acid [2]
- Iron tonic / tablets [3]
- Calcium [4]
- None of these [5]

13.6 Milk and Dairy

How often in the last week did you eat milk and dairy (e.g. sour milk, yoghurt and cheese)

Expects a numeric response (required)

Constraints
Response must be Greater Than or Equal '0'

13.7 Fruit and vegetables

How often in the last week did you eat fruit and vegetables?

Expects a numeric response (required)

Constraints
Response must be Greater Than or Equal '0'
How often in the last week did you eat meats (e.g. chicken, beef, pork)?

Expect a numeric response (required)

Constraints
Response must be Greater Than or Equal '0'

How often in the last week did you eat fish?

Expect a numeric response (required)

Constraints
Response must be Greater Than or Equal '0'

How often in the last week did you eat eggs?

Expect a numeric response (required)

Constraints
Response must be Greater Than or Equal '0'

How often in the last week did you eat margarine and oil?

Expect a numeric response (required)

Constraints
Response must be Greater Than or Equal '0'

How often in the last week did you eat sugar and chocolates?

Expect a numeric response (required)

Constraints
Response must be Greater Than or Equal '0'

How often in the last week did you drink fizzy cold drinks?

Expect a numeric response (required)

Constraints
Response must be Greater Than or Equal '0'

How often in the last week did you eat breads, samp and porridge?

Expect a numeric response (required)

Constraints
Response must be Greater Than or Equal '0'

How often in the last week did you eat beans and lentils?

Expect a numeric response (required)
Section 14. Baseline Knowledge – Delivery Health

14.1 Delivery Prompt

Now I am going to ask you some questions about when your baby is going to be born.

14.2 Know where will deliver

Do you know which health facility you will deliver at?

- Yes [1]
- No [2]
- Decline to answer [91]

Branches

If response Equals 'No [2]' then skip to Post birth follow-up for mother (14.7)

Prerequisites

Skip when Know where will deliver (14.2) Not Equal 'Yes [1]'

14.3 Delivery Facility

Please select the delivery facility

- Michael Mapongwana Day Hospital [1]
- Site B Hospital [2]
- Tygerberg Hospital [3]
- Mowbray Maternity Hospital [4]
- Home (outside hospital) [5]
- Eastern Cape [6]
- Bishop Lavis [7]
- Other [95]

14.4 Travel means during day

Have you made plans to get to the hospital if you start giving birth during the day?

- Yes [1]
- No [2]
- Decline to answer [91]

14.5 Travel means during night

Have you made plans to get to the hospital if you start giving birth at night?

- Yes [1]
- No [2]
- Decline to Answer [91]

14.6 Delivery companion

Have you asked anybody to go with you to the hospital when you give birth?

- Yes [1]
- No [2]
- Don't Know [99]
- Decline to answer [91]
Section 15. Maternal Knowledge of Vertical Transmission

Prerequisites
Skip when HIV test result (7.5) Equals ‘HIV Positive [1]’

15.1 Skip Section - Interviewer Instruction Only

This is for the interviewer, please DO NOT read it out: Some questions are going to be skipped because they are only for mothers who answered that they were HIV positive.

Expects a single option response (required), Default: Continue

   - Continue [1]

Branches
If response Equals 'Continue [1]' then skip to Baby Feeding Prompt (16.1)
If response Not Equal 'Continue [1]' then skip to Baby Feeding Prompt (16.1)

15.2 Medicine Prompt

Now I have some questions about medicines for you and your baby. While you may not know all the answers to the following questions, please answer each question to the best of your ability.

15.3 Maternal Knowledge Statements Prompt

I am now going to read some statements to you. Please tell me if you agree.

15.4 HIV+ mother » HIV+ baby

Statement: HIV positive women only have HIV positive babies.

Expects a single option response (required)

   - Yes / true [1]
   - No / false [2]
   - Don't know [99]
   - Decline to answer [91]

15.5 Mothers can act to protect child

Statement: HIV positive women can do a lot to influence whether their babies are HIV positive or HIV negative.

Expects a single option response (optional)

   - Yes / true [1]
   - No / false [2]
   - Don't know [99]
   - Decline to answer [91]
Statement: Mixed feeding before 6 months does not increase the chance of my baby getting HIV

Expects a single option response (optional)

- Yes / true [1]
- No / false [2]
- Don't know [99]
- Decline to answer [91]

15.7 Healthy behaviours to protect baby

[Interviewer: For the this question, ask the mother to tell you what they are, then tick all that apply] What are the things that you can do to make sure your baby is born HIV negative?

Expects multiple selected options (required)

- Nothing [1]
- Use only one feeding method [2]
- Breastfeeding only [3]
- Bottle feeding only [4]
- Caesarean birth [5]
- Give cotrimoxazole for 18 months [6]
- Care for nipples if I breastfeed [7]
- Get HIV tested at 6 weeks of age [8]
- Get NVP for newborn at time of birth [9]
- Other [95]
- Don't know [99]
- Decline to answer [91]

Section 16. Feeding Strategies and Prevention of Infections

16.1 Baby Feeding Prompt

Thank you. We are almost at the end of the interview now. I have a few more questions about baby feeding.

16.2 Feeding plan first 6 months

How do you plan to feed your baby for the first 6 months?

Expects a single option response (required)

- Only breastfeeding [1]
- Only formula feeding [2]
- Breastfeed plus formula (and other foods such as pap, water and glucose = mixed feeding) [3]
- Decline to answer [91]

Branches
If response Equals 'Only breastfeeding [1]' then skip to Routine Prompt (17.1)

16.3 Formula feed resources

Given that you plan to formula feed (or mix feed), do you have access to any of the following:

Expects multiple selected options (required)

- Money or other means to obtain formula if the clinic runs out [1]
- Running water in your house [2]
- Electricity to boil water [3]
- None of these [4]
- Decline to answer [91]
Section 17. Routines

17.1 Routine Prompt

Now I would like to ask you some general questions about your activities over the last few days.

17.2 Wake-up time yesterday

What time did you get up yesterday morning?

Expects a time response (required)

17.3 Wake up 2 days ago

What time did you get up two days ago?

Expects a time response (required)

17.4 Wake up 3 days ago

What time did you get up three days ago?

Expects a time response (required)

17.5 Bed time yesterday

What time did you go to bed yesterday evening?

Expects a time response (required)

17.6 Bed time 2 days ago

What time did you go to bed two days ago?

Expects a time response (required)

17.7 Bed time 3 days ago

What time did you go to bed three days ago?

Expects a time response (required)

17.8 Main meal yesterday

What time did you cook the main meal yesterday?

Expects a time response (required)

17.9 Main meal 2 days ago

What time did you cook the main meal two days ago?

Expects a time response (required)

17.10 Main meal 3 days ago

What time did you cook the main meal three days ago?

Expects a time response (required)

17.11 Meal together yesterday

How many times did your family eat a meal together yesterday?
17.12 Meal together 2 days ago

How many times did your family eat a meal together two days ago?

Expects a numeric response (required)

17.13 Meal together 3 days ago

How many times did your family eat a meal together three days ago?

Expects a numeric response (required)

17.14 Household chores yesterday

When did you start your household chores yesterday?

Expects a time response (required)

17.15 Household chores 2 days ago

When did you start your household chores two days ago?

Expects a time response (required)

17.16 Household chores 3 days ago

When did you start your household chores three days ago?

Expects a time response (required)

17.17 Conflict at meal times

How much conflict has there been at meal times in the past three days?

Expects a single option response (required)

- None [1]
- A little [2]
- Quite a lot [3]
- A lot of conflict [4]
- Decline to answer [91]

Section 18. Baseline Stated Future Plans

18.1 Future Plans Prompt

This is the last section of the interview. I am now going to ask you some questions about your future plans.

18.2 Return to work

Do you plan to return to work or school after the baby is born?

Expects a single option response (required)

- Yes / true [1]
- No / false [2]
- Don't know [3]
- Not applicable (unemployed) [4]
- Decline to answer [91]
18.3 Time return work

At what age (of the baby) do you plan to return to work?

Requires a single option response (required)

- less than 1 month [1]
- 1 month [2]
- 6 weeks [3]
- 3 months [4]
- 6 months [5]
- 9 months [6]
- One year [7]
- Other [99]
- Don't know [95]
- Decline to answer [91]

18.4 Caregiver in mothers absence

Who will be the primary caregiver for the baby when you are away?

Requires multiple selected options (required)

- Own Family [1]
- In Laws [2]
- Paid care [3]
- Friends [4]
- Neighbour [5]
- Don't know [99]
- Decline to answer [91]

Section 19. End of Survey

19.1 Voucher given

Was the participant given R80 food voucher?

Requires a single option response (required)

- Yes [1]
- No [2]

19.2 End

You have reached the end of the survey. You can go back and review previous responses or select Next to complete the section.
Baseline Part 1 (Xhosa)

Section 1. Interview Identification

1.1 Interviewer code

Nceda ubhale ikhawudwe yomphathi wodlwano-ndlebe.
Expects a numeric response (required)

1.2 Neighbourhood code

Nceda ubhale ikhawudwe y lengqi yi khabe.
Expects a single line text response (required)

1.3 Date of Interview

Nceda uqinisekise ngomhla wolwolwano-ndlebe.
Expects a date response (required)

1.4 Time of Interview

Nceda uqinisekise ngexesha lolwolwano-ndlebe.
Expects a time response (required)

1.5 Participant ID

Nceda ubhale ikhawudwe yomthathi-nxaxheba, leyo imchongayo njengowhalukileyo nofana yedwa.
Expects a valid GS1 identifier (required)

Section 2. Informed Consent

2.1 Informed consent granted

Ifo yemvumo engengqiqué ichaziwe yaza yamkeleka?
Expects a single option response (required)

- Ewe [1]
- Hayi [2]

Branches
If response Equals 'Ewe [1]' then skip to GQ Prompt (3.1)
If response Equals 'Hayi [2]' then skip to Home visits (2.2)

2.2 Home visits

Ukuba ingqiqei yakho isendaweni ekusebenza kuyo uMama ongumCebisi, ungathanda ukuphindla utyelelwwe kwikhaya lakho nangona ukhethe ukuba ungayithathi inxaxheba kudlwano-ndlebe olumalunga nophando?
Expects a single option response (required)

- Ewe [1]
- Hayi [2]

Branches
If response Equals 'Hayi [2]' then skip to End (13.2)
If response Equals 'Ewe [1]' then skip to Expected Birth Date No ICF (13.1)
Section 3. Participant Demographics

3.1 GG Prompt
Siyabulela ngokuthatha kwakho inxaxheba kololwano-ndlebe. Ndiza kuqalisa ngokukubuza imibuzo eqhelekeleayo ngesiqu sakho.

3.2 Identity Document
Unayo incwadana esisazisi?
Expect a single option response (required)
- Ewe [1]
- Hayi [2]
- Ndiyala ukuphendula [91]

3.3 Mother’s age
Umdala kanganani (ngokweminyaka epheleleyo yakho)?
Expect a numeric response (required)

3.4 Mother’s date of birth
Wazalwa ngowuphi umhla, inyang aonyaka?
Expect a date response (required)

3.5 Mother’s home language
Uthetha oluphi ulwini lweenkobe?
Expect a single option response (required)
- isiNgesi [1]
- isiZala [2]
- isiXhosa [3]
- Enye [95]
- Ndiyala ukuphendula [91]

3.6 Participant education
Leliphile olona nqanaba lemfundo liphezulu oligqibileyo?
Expect a single option response (required)
- Andifundanga [0]
- Greyidi 1 [1]
- Greyidi 2 [2]
- Greyidi 3 [3]
- Greyidi 4 [4]
- Greyidi 5 [5]
- Greyidi 6 [6]
- Greyidi 7 [7]
- Greyidi 8 [8]
- Greyidi 9 [9]
- Greyidi 10 [10]
- Greyidi 11 [11]
- Greyidi 12 / iMatriki [12]
- ISatifikethi emva kweMatriki / iDiploma [13]
- Umfundo enomsila [14]
- Ndiyala ukuphendula [91]
3.7 Marital status

Akukatshati okanye utshatle (nokuba kungayiphile na indlela)?

- **Anditshatanga** [1]
- **Nditshatle** [2]
- **Anditshatanga, ndihlala neqabane** [3]
- **Ndiyala ukuphendula** [91]

3.8 Favourite Colour

Ngowuphile owona mbala uwuthandayo?

Exppects a single line text response (required)

---

Section 4. Household Overview

4.1 Household Overview Prompt

Enkosi. Ngoku ndithanda ukukubuza imibuzo embalwa ngabantu abahlala naye.

4.2 Participant lives with others

Uhlala nabanye abantu endlwini okuyo (abantu abalala apho ngaphezulu kweentsuku ezi-2 kwiveki nganye)?

Exppects a single option response (required)

- **Ewe** [1]
- **Hayi** [2]
- **Ndiyala ukuphendula** [91]

4.3 HH Member Count


Exppects a numeric response (required)

**Constraints**

- Response must be Greater Than or Equal '1'
- Response must be Less Than or Equal '15'

4.4 Household Member Prompt

Icandelo elilandelayo liza kuthatha inkcukacha ezimalungu namalungu akule ndlu.

---

Repeat this section for value of **HH Member Count (4.3)**

Section 5. Household People Count

5.1 HH Member Name

Ngubani igama lalo mntu?

Exppects a single line text response (required)

5.2 HH Member Age

Buyintoni ubu_ (4455) _kubudala bukhe?

Exppects a numeric response (required)
Section 6. Demographic Information about Housing

6.1 Housing Prompt

Kweli candela lilandelayo imibuzo imalunga nendawo ohlala kuy o.

6.2 Housing description

Indlu yakowenu iloluphi uhlobo?
Expecta single option response (required)
- Sisakhiso sezitena esizeni esisodwa [1]
- Yindlwana egsuxnyekiweyo esemva kwendlu enkulule esizeni [2]
- Lityotombi elisemva kwendlu enkulule esizeni [3]
- Yihosteli, apho abaqeshwa behlala beyintlanganisela [5]
- Ndiyala ukuphendula [91]

6.3 Water source

Amanzi enivaselayo niwafumana kowuphi umthombo?
Expecta single option response (required)
- Amanzi akhoyo endlwini [1]
- Amanzi akhoyo apha esizeni [2]
- Amanzi aphume kumpomi / kwitanki esetyenziswa nguwenke-wonke [3]
- Amanzi omlambo [4]
- Ndiyala ukuphendula. [91]

6.4 Household toilet

Nisebenzisa oluphi uhlobo lwezindlu zangasese?
Expecta single option response (required)
- Esizeni kukho indlu yangase esungxulwayo [1]
- Indlu yangaseeseyango saapho kusetyenziswa inkonkxa egutyulwayo ngobusuku ukuze ibe likhamte [2]
- Indlu yangaseeseesawonke-wonke [3]
- Indlu yangaseeseesawonke-ewonke [4]
- Ayikho [5]
- Enye [95]
- Ndiyala ukuphendula [91]

6.5 Electricity

Ninawo umbane kule ndlu yenu?
Expecta single option response (required)
- Ewe [1]
- Hayi [2]
- Ndiyala ukuphendula [91]

6.6 Cooking fuel

Zeziphi izibasoezisebenzisela ukupheka?
Expecta single option response (required)
6.7 Household items

**Indlu okuyo inay o na nyiphi na kwezi zinto ndiza kukuFundela zona?**

*Expects multiple selected options (required)*
- Sisitovu (samalahle, sombane, yiprayimasi esebenzengeparafini, sesegesi) [1]
- Yiselqowuni / ngnunomyayo [2]
- Yibhayisekilile [3]
- Ngumunathatholo / yireyido [4]
- Sisibandisi / sisikhwenkezi [5]
- Yithelelishini / ngumabonwakude [6]
- Yimo esebenzyayo engenazingsi [7]
- Yifowuni (ese-ofisinisw) / esikhaya, iseziTantjeni endaweni yayo [8]
- Yikhompyutha [9]
- Ngumnavhazwe / yi-intern (ekwikhompyutha) [10]
- Ngumnavhazwe / yi-intern (ekwiselfowuni) [11]
- Ndiyala ukuphendula. [91]
- Asiyiyo nanye kwezi [12]

---

**Section 7. Income and Employment**

**7.1 Income Prompt**

*Ngokudlithanda ukuKubuzwa imibuzo embalwa ngomsebenzi wakho nemali oyizuzayo.*

**7.2 Participant employed**

*Uqeshiwe?*

*Expects a single option response (required)*
- Ukusebenza okanye ukwenza into ngamaxesha athile xa kufuneka [1]
- Ukusebenza isiSihina [2]
- Umntu ongsungxiyo / ubizelwa ubhlobo oluthile lomsebenzi [3]
- Hayi [4]
- Ukuziqhesha uzenzele imali [5]
- Ndiyala ukuPhendula [91]

---

**7.3 Household income sources**

*Endlwini yakho ifumaneka njani imali?*

*Expects multiple selected options (required)*
- Umuzo ofumaneka qho, mhlwumbe ngenyanga [1]
- Imali engafumaneki ngalo lonke ixesha, iza ngamaxesha athile [2]
- Umsebenzi ozenzela ngokwakho ungqeshwa mntu [3]
- Igalelo / ama.lizo avela kwabanye abantu [4]
- Umhlala-phantsi [5]
- Indodla efumaneka ngenxa yobudala bontu [6]
- Igranti / isibonelela sokukahazeka [7]
- Igranti yenkxaso yabantwana [8]
7.4 Household monthly income

Endlwini yakho yimalini efumanekayo ngenevanga ngokomndili?

Requires a single option response (required)

- Into engekhoyo kude kufikwe kuma R499
- 1-R500 kude kufikwe kwi-R1000
- 1-R1001 kuyaya kwi-R2000
- 1-R2001 kuyaya kwi-R5000
- 1-R5001 kuyaya kwi-R8000
- 1-R8000 nangaphezu kwaleyo
- Andazi
- Ndiyala ukuphendula

7.5 Participant days of hunger

Kwiveki ephelileyo zingaphi iintsuku obulambile ngazo? (Ndithetha ngeentsuku oziqondileyo wena ukuba khang utye ngokwaneleyo).

Requires a numeric response (required)

Constraints

Response must be Less or Equal '7'

7.6 Household children hunger

Zingaphi iintsuku kwiveki ephelileyo apho bekukho abantwana abebelambile? (Ndithetha ngeentsuku apho wena uqondileyo ukuba abantwana bebefuna okunye ukutya).

Requires a numeric response (required)

Constraints

Response must be Less or Equal '7'

---

Section 8. This Pregnancy

8.1 Pregnancy Prompt

Ngoku ndinemibuzo embalwa nemifutshane ngosana osaza kulefumana.

8.2 Baby due date

Usana lwakho uya kulezala ngowuphi umhla?

Requires a date response (required)

8.3 Weeks pregnant

Zingaphi iiveki zokuhulela kwakho?

Requires a numeric response (required)

Constraints

Response must be Less Than or Equal '48'
Section 9. General Health - Participant

9.1 General Health Prompt

Enkosi. Imibuzo elandelayo embalwa imalunga nempilo yakho ngokuqhelekileyo, ngokunxulumene nezigulo ezifana neSifo seSwekile, ngokuKhubazeka nangesiyo sePhepha.

9.2 Participant Height

Nceda ubhale ubude bomthathi-nxaxheba (ngokweemitha):

Expects a decimal response (required)

Constraints
Response must be Less Than or Equal '3'
Response must be Greater Than or Equal '0.5'

9.3 Participant Weight

Nceda ubhale ubunzima bomthathi-nxaxheba (ngokweekilogram):

Expects a decimal response (required)

Constraints
Response must be Greater Than or Equal '30'
Response must be Less Than or Equal '250'

9.4 Chronic illness

Ubukhe waxilongwa wafunyaniswa unesinye sezi zifio zilandelayo zingapheliyo?

Expects multiple selected options (required)

- Isifo seSwekile [1]
- Isifo sokunyukelwa ligazi [2]
- ukuKhubazeka [3]
- Umbefu [4]
- Asikho [5]
- Esihle [8]
- Ndiyala ukuphendula [91]

9.5 Ever Tested TB

Wakha waxilongwa kukhangelwa isifo sePhepha?

Expects a single option response (required)

- Ewe [1]
- Hayi [2]
- Ndiyala ukuphendula [91]

9.6 Previous TB result

Wakha waxilongwa wafunyaniswa unaso isiFo sePhepha?

Expects a single option response (required)

- Ewe [1]
- Hayi [2]
9.7 Previous TB test result

Ngeli xesha ukhulelwayo, umsebenzi yakho yemibonge

Expects a single option response (required)

- Ewe [1]
- Hayi [2]
- Ndiyala ukuphendula [91]

Branches

If response Not Equal 'Ewe [1]' then skip to TB test this pregnancy (9.8)

9.8 TB test this pregnancy

Ngeli xesha ukhulelwayo sowu kwiwenzilongo ephelileyo apho sePhepha?

Expects a single option response (required)

- Ewe [1]
- Hayi [2]
- Ndiyala ukuphendula [91]

Branches

If response Not Equal 'Ewe [1]' then skip to HH member TB test (9.11)

9.9 Current TB test result

Ngeli xesha ukhulelwayo, umsebenzi yakho yemibonge

Expects a single option response (required)

- Ewe [1]
- Hayi [2]
- Ndiyala ukuphendula [91]

Branches

If response Not Equal 'Ewe [1]' then skip to HH member TB test (9.11)

9.10 Current treatment TB

Ngoku uyalufumana unyango lwesifo sePhepha?

Expects a single option response (required)

- Ewe [1]
- Hayi [2]
- Ndiyala ukuphendula [91]

9.11 HH member TB test

Ngeli xesha ukhulelwayo ukhona umntu ONGOMNYE kowenu okhe waya kuxilongwa wafunyanwa enesifo sePhepha?

Expects a single option response (required)

- Ewe [1]
- Hayi [2]
- Andazi. [99]
- Ndiyala ukuphendula [91]

Branches

If response Not Equal 'Ewe [1]' then skip to Mental Health Prompt (10.1)

9.12 HH member current treatment

Abo bantu ngoku bayalufumana unyango lwesifo sePhepha?

Expects a single option response (required)

- Ewe [1]
- Hayi [2]
- Andazi. [99]
- Ndiyala ukuphendula [91]
Section 10. Mental Health

10.1 Mental Health Prompt

Ngoku ndinemibuzo ekufuneka ndikubuze yona ngovakalelo lwakho bheveki epheleleyo. Nceca undinike impendulo esondele kakhulu kwindlela ozive ngayo EZINTSUKWINI EZISI-ʠ EZIGOQITHILEYO, andilufuni uvakalelo lwakho lwamnhlanje.

10.2 Laugh

Ndikwazile ukuhleka, ndakubona nokumangalisayo ezintweni.

- Expects a single option response (required)
  - Kangangako bendikwenza ngaphambili (0)
  - Hayi kangako, okwangoku (1)
  - Ngokuqinisekileyo ayikho kangako okwangoku (2)
  - Akunjalo (3)

10.3 Enjoyment

Ndike ndajonga phambili ndisonwayiswa zizinto.

- Expects a single option response (required)
  - Kangangoko bendinokwenza (0)
  - Kungaphantsi kunoko bendisenza (1)
  - Ngokuqinisekileyo kungaphantsi kunoko bendisenza (2)
  - Akwenzeke kwaphela (3)

10.4 Self Blame

Ndizigxilele ngokungekho mfuneko xa izinto bezingahambi kakuhle.

- Expects a single option response (required)
  - Ewe, kumaxesha amaninzi (3)
  - Ewe, ngamanye amaxesha (2)
  - Akusoloko kusenzeqa qho (1)
  - Hayi, zange kwenzeke (0)

10.5 Anxious/worry

Bendineshala okanye ndikhathazekile kungekho sizathu.

- Expects a single option response (required)
  - Hayi, akunjalo (0)
  - Zange kwenzeke (1)
  - Ewe, ngamanye amaxesha (2)
  - Ewe, kwenzeke qho (3)

10.6 Panicky

Ndizive ndibuhlungu okanye ndisoyika kungekho sizathu.

- Expects a single option response (required)
  - Ewe, kwenzeka kakhulu (3)
  - Ewe, ngamanye amaxesha (2)
  - Hayi, akwenzeksi ngamandla (1)
  - Hayi, akunjalo (0)

10.7 Things piled up

Imeko ibindongamele.

- Expects a single option response (required)
  - Ewe, kumaxesha amaninzi bendingakwazi kumelana naloo nto (3)
  - Ewe, ngamanye amaxesha bendingakwazi ukumelana naloo nto njengesiqhelo (2)
  - Hayi, kumaxesha amaninzi bendimelana kakuhle naloo nto (1)
10.8 Difficulty sleeping

**Bendingonwabanga kunzima nokuba ndilale.**

*Expects a single option response (required)*

- Ewe, kumaxesha amaninzi [3]
- Ewe, ngamanye amaxesha [2]
- Bekusenzeka qho [1]
- Hayi, akunjalo [0]

10.9 Sad/miserable

**Bendilsizini okanye bendixakanisekile.**

*Expects a single option response (required)*

- Ewe, kumaxesha amaninzi [3]
- Ewe, ngamanye amaxesha [2]
- Bekusenzeka qho [1]
- Hayi, akunjalo [0]

10.10 Crying

**Bendingonwabanga ndada ndamana ndilila.**

*Expects a single option response (required)*

- Ewe, kumaxesha amaninzi [3]
- Ewe, bekusoloko kusenzeka [2]
- Bekusenzeka kushela ngamaxesha athile [1]
- Hayi, zange kwenzeke [0]

10.11 Self harm

**Ikhe yandifikela ingcina yokuba mandizenzakalise.**

*Expects a single option response (required)*

- Ewe, bekusenzeka qho [3]
- Ngamanye amaxesha [2]
- Zange kwenzeke [1]
- Zange [0]

10.12 General Health Questionnaire (GHQ) Prompt


10.13 GHQ Concentrate

**Ukwazile ukuba nenyameko kuyo yonke into oynzayo?**

*Expects a single option response (required)*

- Kubhetele kunesiqhelo [3]
- Kunje ngesiqhelo [2]
- Kungaphantsi kwendlela eqhelekiyo [1]
- Kungaphantsi kakulu kunesiqhelo [0]

10.14 GHQ Lost sleep

**Kutshanje ukhe waziva ungenakulala ngenxa yokuhathazeka?**

*Expects a single option response (required)*

- Kubhetele kunesiqhelo [3]
- Akungaphezuwa kwesiqhelo [2]
10.15 GHQ Useful part

Kutshanje ukhe waziva ungumntu odlala indima eluncedo ezintweni?
Expect a single option response (required)
- Kungaphenzulu kunesiqhelo [3]
- Kuyafana nesiqhelo [2]
- Uncedo lungaphantsi kolwesiqhelo [1]
- Luncenci kakhulu uncedo [0]

10.16 GHQ Decisions

Kutshanje ukhe waziva unakhoro ukwenza iziqibo ngezinto?
Expect a single option response (required)
- Bendithe chatha kunesiqhelo [3]
- Bekufana nesiqhelo [2]
- Bekunganeno kwesiqhelo [1]
- Bekungafani tu, kungaphantsi kwesiqhelo [0]

10.17 GHQ Under strain

Kutshanje ukhe waziva usoloko uphantsi koxinzelelo?
Expect a single option response (required)
- Bekungenjalo tu kwaphela [3]
- Akungaphenzulu kwesiqhelo [2]
- Kungaphenzulu kunesiqhelo [1]
- Bekuthe chatha kunesiqhelo [0]

10.18 GHQ Unable overcome difficulties

Kutshanje ukhe waziva ungenakho ukuboyisa ubunzima okubo?
Expect a single option response (required)
- Bekungenjalo tu kwaphela [3]
- Akungaphezulu kwesiqhelo [2]
- Kungaphenzulu kunesiqhelo [1]
- Bekuthe charha kunesiqhelo [0]

10.19 GHQ Enjoy activities

Kutshanje ukhe waziva wonwabile kwimisebenzi yakho yemihla ngemihla?
Expect a single option response (required)
- Imisebenzi indonwabise ngaphezu kwesiqhelo [3]
- Ukonwaba kuyafana nesiqhelo [2]
- Kungaphantsi kunesiqhelo [1]
- Andisonwabanga njengeko bendijnalo [0]

10.20 GHQ Face problems

Kutshanje ukhe waziva ukuhlangabezana neengxaki zakho?
Expect a single option response (required)
- Ngaphezu kunesiqhelo [3]
- Njeesiqhelo [2]
- Akufani nesiqhelo [1]
- Andisameleni kakhule neengxaki [0]

10.21 GHQ Unhappy/depressed

Kutshanje ubukhe waziva ungowambahanga, udakumible?
Section 11. Social Support

11.1 Social Support Prompt

Elandelayo yimibuzo emalunga nabahlolo kunye nezalamane zakho ezisoloko zikuxhasa.

11.2 Close friends and relatives

Bangaphi abahlolo abasondelelo kunye nezalamane onazo? Ndithetha ngabantu ekulula wena ukuba uthethe nabo ngezinto ezisengqondweni kuwe.

11.3 Frequency Contact

Kule nyanga iphelilelo, phantse abe mangaphi amaxeshu uqhagamshelana nabahlolo kunye nezalamane zakho (kuqukwa utyelelo, ukutsalelwa umxheba, ukuthunyelwa imiyalezo emifuqshane kwiselfowuni kunye neendibano-zolonwabo)?

11.4 Participation in groups or organisations

Ngowuphi (ukuba ukhona) kule mibutho ilandelayo, othatha kuwo inxaxheba?

10.22 GHQ Losing confidence

Kutshanje ubukhe akwabinakho ukuzithemba?

10.23 GHQ Worthless person

Kutshanje ubukhe wazithatha njengomntu ongenaxabiso?

10.24 GHQ Reasonably happy

Kutshanje ubukhe waziva wonwabile xa ububona izinto ebezisandula ukwenzeka?
11.5 Recreation time

Kwinyanga ephelileyo, kukangaphi usenza izinto zokukonwabiso okanye zokukuphumza ezifana nokubukela umabonwakude, ukuya ecaweni, ukuya kulingisa imwele zakh, ukuya emculweni nokudanisa?

Expects a single option response (required)

- Zange
- Kanye/kabini ngenyanga
- Kanye okanye kabini ngeveki
- Kaninzi evekini
- Yonke imihla
- Ndinya ukuphendula
- Andazi

11.6 Practical support

Mangaphi amaxeshwa kwiveki ephelileyo, apho bekukho umuntu okunika inkhaso ngokukwenzela izinto? (Umzekelo: unikwa imali yokukhwela izithuthi, uncediswa emsebenzini wendlu, ugcinelewa umntwana)

Expects a numeric response (required)

11.7 Current partner

Khona ngoku unalo izqabane?

Expects a single option response (required)

- Ewe
- Hayi
- Ndinya ukuphendula

Branches

If response Not Equal 'Ewe' then skip to Trust, talk to Mother (11.11)

11.8 Trust and share with partner

Umyeni wakho / izqabane lakho ungathetha, ungathetha nalo ukuze nabelane ngovakalelo?

Expects a single option response (required)

- Zange
- Ngamanye amaxeshwa
- Qho
- Ndinya ukuphendula

11.9 Turn to partner in difficulty

Umyeni wakho okanye izqabane lakho ungayama kulo ucele noncedo ngamaxesha obunzima?

Expects a single option response (required)

- Zange
- Ngamanye amaxeshwa
- Qho
- Ndinya ukuphendula

11.10 Partner practical help

Lakhona uncedo akunika lona lweemfuno ezimandla?
### 11.11 Trust, talk to Mother

Umama wakho ungamthemba, ungathetha naye ngokungafihlisayo, ungabelana naye ngezimvo zakho?

**Expects a single option response (required)**
- Zange [1]
- Ngamanye amaxeshisa [2]
- Qho [3]
- Ndiyala ukuphendula [91]

**Branches**

If response Equals 'Umama wabhubha. [4]' then skip to Trust, talk to father (11.14)

### 11.12 Turn to mother in difficulty

Ngamaxesha obunzima ungaya ujike ucele uncedo kumama wakho?

**Expects a single option response (required)**
- Zange [1]
- Ngamanye amaxeshisa [2]
- Qho [3]
- Umama wabhubha. [4]
- Ndiyala ukuphendula [91]

### 11.13 Mother practical help

Lukhona uncedo olumandla olufumanayo kumama wakho?

**Expects a single option response (required)**
- Zange [1]
- Ngamanye amaxeshisa [2]
- Qho [3]
- Umama wabhubha. [4]
- Ndiyala ukuphendula [91]

### 11.14 Trust, talk to father

Utata wakho ungamthemba, ungathetha naye ngokukhululekileyo wabelane naye ngeengcamango zakho?

**Expects a single option response (required)**
- Zange [1]
- Ngamanye amaxeshisa [2]
- Qho [3]
- Utata wabhubha. [4]
- Ndiyala ukuphendula [91]

**Branches**

If response Equals 'Utata wabhubha. [4]' then skip to Father Prompt (12.1)

### 11.15 Turn to father in difficulty

Ngamaxesha obunzima ungakwazi ukwayama ujike ucele uncedo kutata wakho?

**Expects a single option response (required)**
- Zange [1]
- Ngamanye amaxeshisa [2]
- Qho [3]
- Utata wabhubha. [4]
11.16 Father practical help

Uyalufumana uncedo lomsebenzi okanye lwento oyifunayo kutata wakho?

Expects a single option response (required)

- Zange [1]
- Ngamanye amaxesha [2]
- Qho [3]
- Utata wababha [4]
- Ndiyala ukuphendula [91]

Section 12. Father of the Child

12.1 Father Prompt

Enkosi. Ngoku ndithanda ukukubuza imibuzo ngoyise walo mntwana.

12.2 Fathers knowledge of pregnancy

Uyise walo mntwana ukhe wamxelela ngokukhulelwana kwakho?

Expects a single option response (required)

- Ewe [1]
- Hayi [2]
- Ndiyala ukuphendula [91]

12.3 Fathers acknowledgement of baby

Utata lo uzwa kumazisa (njengowakhe) lo mntwana ebantwini bakwabo?

Expects a single option response (required)

- Ewe [1]
- Hayi [2]
- Andazi [99]
- Ndiyala ukuphendula [91]

12.4 Fathers financial support

Uyise wolu sana uyakuxhasa na ngezimali?

Expects a single option response (required)

- Ewe [1]
- Hayi [2]
- Ndiyala ukuphendula [91]

12.5 Father staying with you

Uyise wolu sana uhlala nawe?

Expects a single option response (required)

- Ewe [1]
- Hayi [2]
- Ndiyala ukuphendula [91]

12.6 Father opinions on feeding

Uyise wolu sana uneembomo anazo ngendlela yokondliwa kosana?

Expects a single option response (required)

- Ewe [1]
- Hayi [2]
- Andazi [99]
12.7 Father feeding suggestion

Phofu lo mfo uthanda ukulondla njani olu sana?

Expects a single option response (required)

- Ukuncancisa usana [1]
- Ukondla ngeformula [2]
- Ubisi lwebele nokunye ukutya [3]
- Andazi [99]
- Ndiyala ukuphendula [91]

Branches

If response Not Equal 'Ewe [1]' then skip to End Part 1 (13.3)

If response Equals 'Ukuncancisa usana [1]' then skip to End Part 1 (13.3)

Section 13. End of Survey

13.1 Expected Birth Date No ICF

Ngowuphi owona mhla ulindele ukulubeleka ngawo usana lwakho?

Expects a date response (required)

13.2 End

Ufikielele esiphelweni solu phando. Ungabuyela emva uhlolisise indlela obuphendule ngayo okanye ungazikhethela OLULANDELAYO ukuze uqibezele icandelo.

Prerequisites

Skip when Informed consent granted (2.1) Not Equal 'Ewe [1]'

13.3 End Part 1

Ufikielele ekugqibeleni kwisifundo sokuqala. Buyela umva ujonge impendulo okanye khetha elandelayo ukugqibezela esisahluko. Xa uthe wasigqiba esesahluko nceda uye kwicandela lesibini le Baseline
Section 1. Interview Identification

1.1 Interviewer code

Nceda ubhale ikwowudi yomPhathi wodlwano-ndlebe.

Expects a numeric response (required)

1.2 Neighbourhood code

Nceda ubhale ikwowudi yengqiqi yakhoh.

Expects a single line text response (required)

1.3 Date of Interview

Nceda uqiniseke ngomhla wolu dliwano-ndlebe.

Expects a date response (required)

1.4 Time of Interview

Nceda uqiniseke ngexeshla lolu dliwano-ndlebe.

Expects a time response (required)

1.5 Participant ID

Nceda ubhale ikwowudi yomthathi-nxaxheba, leyo imchongayo njengowahlukileyo nofana yedwa.

Expects a valid GS1 identifier (required)

Section 2. Relationship Status

2.1 Current Partner BS2

Khona ngoku unalo iqabane?

Expects a single option response (required)

≠ Ewe [1]
≠ Hayi [2]
≠ Ndiyala ukuphendula [91]

Section 3. Use of Tobacco & Other Substances

3.1 Smoking Prompt

Imibuzo emitsha imalunga nokutshaya.

3.2 Use of Tobacco

Uyalisebenza icuba?

Expects a single option response (required)

≠ Ewe [1]
3.3 Tobacco Frequency

Kwiinyanga ezi-3 ezidlulileyo, icuba ulisebenzise khangangeentsuku ezingaphi?

**Expect a numeric response (required)**

**Constraints**
- Response must be Greater Than or Equal '0'
- Response must be Less Than or Equal '92'

3.4 Use of Dagga

Uyawusebenzisa umya?

**Expect a single option response (required)**

- Ewe [1]
- Hayi [2]
- Ndiyala ukuphendula [91]

**Branches**
If response Not Equal 'Ewe [1]' then skip to **Use of Tik (3.6)**

3.5 Dagga Frequency

Umya uwusebenzise khangangeentsuku ezingaphi KWIINYANGA EZI-3 ezigqithileyo?

**Expect a numeric response (required)**

**Constraints**
- Response must be Greater Than or Equal '0'
- Response must be Less Than or Equal '92'

3.6 Use of Tik

Uyawisebenzisa iTik?

**Expect a single option response (required)**

- Ewe [1]
- Hayi [2]
- Ndiyala ukuphendula [91]

**Branches**
If response Not Equal 'Ewe [1]' then skip to **Type of traditional medicines used (4.1)**

3.7 Tik Frequency

ITik uyawisebenzisa khangangeentsuku ezingaphi KWIINYANGA EZI-3 ezigqithileyo?

**Expect a numeric response (required)**

**Constraints**
- Response must be Greater Than or Equal '0'
- Response must be Less Than or Equal '92'

4. Use of Traditional Medicines

4.1 Type of traditional medicines used

Nceda usixelele ngozi zinto zilandelayo, ukuba ikhona, oyisebenzisileyo ngeli xesha sowukhulelwe.

**Expect multiple selected options (optional)**

- Ukucima ngeyeza [1]
- Iivithamini eziqhelekileyo okanye izoncezelelo ezifumana kulwelo [2]
Section 5. Use of Alcohol

5.1 Alcohol Prompt

Ngoku ndingathanda ukukubuza eminye imibuzo embalwa ngokusela utsiwala. Ndiyazi ukuba ngamanye amaxesha le mbuzo ingakuxakanisa, kodwa khumbula ukuba impendulo zakho zakugcinwa ziyimihlelo yaye akakhlo onokwazi ukuba ezo ziimpendulo zakho. Igama lakho alizokuvela kuzo naziphi na iifom zophando yaye impendulo zakho asizokwabelana ngazo naye nabani na, ngaphandle kwabasebenzi abaphambiskolo. Le mbuzo ibalulekileyo siyibuzza kwabaninzi abantu abahhinqileyo, yaye siyabulela kuwe ngokuzama kanganjako ekubeni uyeiphendule uyanisekile.

5.2 Weeks pregnant when found out about pregnancy

Uziqonde sekuziiveki ezingaphi ukuba wena ukhulelwe?

Expect a numeric response (required)

5.3 Alcohol in pregnancy before knowledge of pregnancy

Utsiwala ubusebenzise rhoqo kangakanani enyangeni phambi kokuba uzifumanise ukhulelwe? [UMPHATHI WODLIWANO-NDLEBE UZA KUSEBENZISA IKOMITYANA EQHELEKILEYO NEBONA KALE INGUMLINGANISELE WESISELO ESINYE].

Expect a single option response (required)

- Zange [1]
- Kungaphansi kwexesha yakanye ngenyanga [2]
- Kanye ngenyanga [3]
- Kabini okanye kathathu ngenyanga [4]
- Kanye ngveke [5]
- Amaxesha ama-2 ngveke [6]
- Amaxesha ama-3 nalowo ama-4 ngveke [7]
- Phantse yonke imihla [8]
- Yonke imihla [9]
- Ndiyala ukuphendula [91]

Branches

If response Equals 'Zange [1]' then skip to Alcohol during pregnancy after learning of pregnancy. (5.7)

If response Equals 'Ndiyala ukuphendula [91]' then skip to Alcohol during pregnancy after learning of pregnancy. (5.7)

5.4 Alcohol per day on days when used alcohol before knowledge of pregnancy

Ngalaa nyanga ephambi kokuzibhaqa kwakho ukuba ukhulelwwe, xa ubala zonke iintlobo zotywala zidibene, zingaphi iziselo OBUDLA ngokuzisele ngeentsuku zokusela kwakho utsiwala?

Expect a single option response (required)

- 1 okanye 2 [1]
- 3 okanye 4 [2]
- 5 okanye 6 [3]
- 7, 8 okanye 9 [4]
- Ali-to nangaphheru koko [5]
- Ndiyala ukuphendula [91]

5.5 Frequency of four or more drinks per day before knowledge of pregnancy

Ngalaa nyanga ephambi kokuzibhaqa kwakho ukuba ukhulelwwe, kumalunga kaninzi kangakanani apho ubufumana iziselo EZIPHELE ngokuzisele NOKO ngosuku olunye?

Expect a single option response (required)
5.6 Frequency of three or more drinks per day before knowledge of pregnancy

Ngakaa nyanga ephambi kokuqizhaha kwakho ukuba ukhulelwwe, kuaninini kanganakani apho ubufumana iziselomzi ETITHATHU okanye NGAPHEZU KOKO ngosuku olunye?
Expects a single option response (optional)
- Zange [1]
- Kungaphantsi kweshe lakanye ngenyanga [2]
- Kanye ngenyanga [3]
- Kabini okanye kathathu ngenyanga [4]
- Kanye ngeveki [5]
- Amaxesha ama-2 ngeveki [6]
- Amaxesha ama-3 nyalwo ama-4 ngeveki [7]
- Phantse yonke imihla [8]
- Yonke imihla [9]
- Ndiyala ukuphendula [10]

5.7 Alcohol during pregnancy after learning of pregnancy.

Njengokuba sowusazi ukuba ukhulelwwe, kuaninini kanganakani usela NALUPHI NA uhlobo lotywala?
Expects a single option response (optional)
- Zange [1]
- Kungaphantsi kweshe lakanye ngenyanga [2]
- Kanye ngenyanga [3]
- Kabini okanye kathathu ngenyanga [4]
- Kanye ngeveki [5]
- Amaxesha ama-2 ngeveki [6]
- Amaxesha ama-3 nyalwo ama-4 ngeveki [7]
- Phantse yonke imihla [8]
- Yonke imihla [9]
- Ndiyala ukuphendula [10]

Branches
If response Equals 'Zange [1]' then skip to Previous Preganancies Prompt (6.1)
If response Equals 'Ndiyala ukuphendula [10]' then skip to Previous Preganancies Prompt (6.1)

5.8 Alcohol per day on days when used alcohol after knowledge of pregnancy

Njengokuba sowusazi ukuba ukhulelwwe, xa ubala zonke iindidi zotywala zidibene, zingaphi iziselomzi ODIA ngokuzifumana ngceentsuku zokuusela kwakho utywala?
Expects a single option response (required)
- 1 okanye 2 [1]
- 3 okanye 4 [2]
- 5 okanye 6 [3]
- 7, 8 okanye 9 [4]
- Ali-10 nangaphuze koko [5]
- Ndiyala ukuphendula [10]
**5.9 Frequency of four or more drinks per day after knowledge of pregnancy**

Njengokuba sowusazi ukuba ukhulelwe, kukaninzini kangakanani uufumana iziseliso EZINE okanye NGAPHEZU KOKO ngosuku?

Expects a single option response (optional)
- Zange [1]
- Kungaphantsi kwexesha lakanye ngenyang [2]
- Kaney ngenyang [3]
- Kabini okanye kathathu ngenyang [4]
- Kaney ngeveki [5]
- Amaxesha ama-2 ngeveki. [6]
- Amaxesha ama-3 nalawo ama-4 ngeveki [7]
- Phantse yonke imihla [8]
- Yonke imihla [9]
- Ndiyala ukuphendula [91]

**5.10 Frequency of three or more drinks per day after knowledge of pregnancy**

Njengokuba sowusazi ukuba ukhulelwe, kukaninzini kangakanani uufumana iziseliso EZITHATHU okanye EZINGAPHEZU KOKO ngosuku?

Expects a single option response (optional)
- Zange [1]
- Kungaphantsi kwexesha lakanye ngenyang [2]
- Kaney ngenyang [3]
- Kabini okanye kathathu ngenyang [4]
- Kaney ngeveki [5]
- Amaxesha ama-2 ngeveki. [6]
- Amaxesha ama-3 nalawo ama-4 ngeveki [7]
- Phantse yonke imihla [8]
- Yonke imihla [9]
- Ndiyala ukuphendula [91]

**5.11 Number of drinks to feel high**

Kufuneka uufumane iziseliso ezingaphi ukuze uzive unxillile?

Expects a numeric response (required)

**5.12 Friend/relatives complained about drinking**

Abahlolo nezalamane zakho ezisondelo yebebekhe bakukhalazela ngokuzele kwakho?

Expects a single option response (required)
- Ewe [1]
- Hayí [2]
- Ndiyala ukuphendula [91]

**5.13 Alcohol upon waking**

Ngamanye amaxesha ukhe usele kwakusasa xa usandula ukuvuka?

Expects a single option response (optional)
- Ewe [1]
- Hayí [2]
- Ndiyala ukuphendula [91]

**5.14 Memory loss with alcohol**

Umhlolo okanye omnye wabukowenu wakha wakuxelela na ngezinto ozithethileyo okanye ozenzileyo ngexesha obusela nobungenakho wena ukuzikhumbula?

Expects a single option response (optional)
- Ewe [1]
Section 6. Reproductive Health

6.1 Previous Pregnancies Prompt

Enkosi. Imibuzo embalwa elandelayo imalunga nexesha eligqithileyo owawukhulelwwe ngalo nangabantwana onokuba uhunabo.

6.2 Total number pregnancies

Ukhe wakhulelwwe kungaphantsi xa udibanisa neli ixesha ukhulelwwe ngalo?

Expects a numeric response (required)

Constraints
Response must be Greater Than or Equal '1'

Branches
If response Equals '1' then skip to Previous treat of STI (6.5)

6.3 Number live births

Uzele entsana ezingaphi eziphilileyo?

Expects a numeric response (required)

6.4 Previous LBW babies

Zingaphi (ukuba lwheela) kwezo ntsana wasizalayo, ezazinobunziwa besikali, (ezazalwa zinobunziwa obabungaphantsi kwvee-2500g)?

Expects a numeric response (required)

Constraints
Response must be Less Than or Equal 'Number live births (6.3)'
Response must be Greater Than or Equal '0'

6.5 Previous treat of STI

Wakwa walufumana unyangwoleziFO EZIFUMANNEKA NGOSULELO KWEZESONDO?

Expects a single option response (required)

6.6 Current Pregnancy Prompt

Ngoku ndineminye imibuzo ngolu sana uluthweleyo.

6.7 Attempt to terminate pregnancy

Ukhe wawama ukusikhupha esi sisu?

Expects a single option response (required)

6.10 Need to cut down drinking

Ngamanye amaxesha ukhe uzive ukuba umele ukusela kancinci?

Expects a single option response (optional)

<table>
<thead>
<tr>
<th>Ewe</th>
<th>Hayi</th>
<th>Ndiyala ukuphendula</th>
</tr>
</thead>
<tbody>
<tr>
<td>[1]</td>
<td>[2]</td>
<td>91</td>
</tr>
</tbody>
</table>

Andazi

Qhuba 4 iiveki

Ndiyala ukuphendula

IsiBhedlele saseTygerberg

Hayi

Ewe

Hayi

Ndiyala ukuphendula

Asiyiyo nanye kwezi

Nayiphi na ivithamini ka

Andazi

Kaninzi / amaxesha amaninzi

Ndiyala ukuphendula

Yonke imihla

Zange

Hayi

Ewe

Ewe

Ewe

Andazi

Kungaphantsi kwenyanga enye

Ndiyala ukuphendula

4

Ndiyala ukuphendula

I

Ewe

Kabini okanye kathathu ngenyanga

Phantse yonke imihla

Ndiyala ukuphendula

Amaxesha ama

Yonke imihla

Zange

Hayi

Ewe

Andazi

Kungaphantsi kwenyanga enye

Ndiyala ukuphendula

4
6.8 Baby planned

Olu sana bubulucwongisele? (Qaphela: ukucw recapdwa kuthetha ukuzifunela ngokwakho okanye wena neqabane lakho benifunda umntwana).

Expects a single option response (optional)

- Ewe [1]
- Hayi [2]
- Ndiyala ukuphendula [91]

6.9 Treatment of STI during this pregnancy

Ngeli xesha ukuhuleweyo ukhe waluwumuma unyango lweZIFO Ezingena Ngosulelo Kungenca Wesondo?

Expects a single option response (optional)

- Ewe [1]
- Hayi [2]
- Ndiyala ukuphendula [91]

---

Section 7. Reproductive Health – HIV & STI’s

7.1 HIV Prompt

Ngoku ndithanda ukukubuza imibuzo ngentsholongwane i-HIV.

7.2 Tested for HIV ever

Wakha waxilongelwa intsholongwane i-HIV?

Expects a single option response (required)

- Ewe [1]
- Hayi [2]
- Ndiyala ukuphendula [91]

Branches

If response Not Equal ‘Ewe [1]’ then skip to Previous Partners Prompt (8.1)

7.3 Date last tested

Wagqibela nini ukuxilongelwa intsholongwane i-HIV?

Expects a date response (required)

7.4 HIV test prompt

Umbuzo olandelayo umalungu neziphumo zokuxilongelwa i-HIV. Ndiyazi ukuba lo mbuzo uyaxakanisa. Nceda uqiniseke ukuba umdolwulo yakho iya kuhlala iyimfihlelo, ayiseze ihlanganiswe negama lakho okanye neenkukacha zakho nangayiphila ni indlela. Akakhlo mntu uyakuze ayazi umdolwulo yalo mbuzo, nangona kunjalo, le projekhthi iya kuncedakala kakhulu xa wena unokwabelana nathi ngezi nkukacha.

7.5 HIV test result

Zibe yintoni iziphumo zengxilongo yakho?

Expects a single option response (required)

- HIV Positive [1]
- HIV Negative [2]
- Ndiyala ukuphendula [91]

---

Section 8. Partnerships – Previous Sexual behaviour
8.1 Previous Partners Prompt

Imibuzo embalwa elandelayo imalunga namaqabane akho owawusabelana nawo ngesondo kwixesha eladlalayo. Kwakhona, qiniseka ukuba ezikukhaca zakuhlala ziyimfihlelo.

8.2 Lifetime sexual partners

Ebobini bakho bangaphi abantu abahlukeneyo owakha wabelana nabo ngesondo? Xa ungasakhumbili ngelo nani, ncda uqashisele kakhle.

- Expects a numeric response (required)

Constraints
Response must be Greater Than or Equal '0'

8.3 Sexual partners in previous year

Kunyaka ophelileyo bangaphi abantu owakha wabelana nabo ngesondo?

- Expects a numeric response (required)

Constraints
Response must be Less Than or Equal 'Lifetime sexual partners (8.2)'
Response must be Greater Than or Equal '0'

8.4 Concurrent sexual partners past year

Kwakhwa kwakho isexha kunyaka ophelileyo apho wawusabelana ngesondo namaqabane amabini okanye angaphezu kwelo nani kwangelo xesha linye? (Qaphela mPhathi wodliliano-ndlebe: Oku kuthetha ukuba neqabane elingaphezu kwesinye ngaxesha-nye, ingelilo iqela odirana nalo ngesondo).

- Expects a single option response (required)
  - Ewe [1]
  - Hayi [2]
  - Ndiyala ukuphendula [9]

8.5 Knowledge of partners HIV status past year

Kumaqabane okhe wadibana nawo ngesondo kunyaka ophelileyo, mangaphi kuwo onolwazi ngemeko yawo ye-HIV?

- Expects a numeric response (required)

Constraints
Response must be Less Than or Equal 'Sexual partners in previous year (8.3)'
Response must be Greater Than or Equal '0'

Branches
If response Equals '0' then skip to Any partners engaged in HIV status discussion past year (8.7)

8.6 Number partners HIV+ past year

Mangaphi ekuthiwa a-HIV+ kuloo maqabane akho esando onyaka ophelileyo?

- Expects a numeric response (required)

Constraints
Response must be Less Than or Equal 'Sexual partners in previous year (8.3)'
Response must be Greater Than or Equal '0'

8.7 Any partners engaged in HIV status discussion past year

Kuloo maqabane akho esando #ERROR: Missing question reference##, mangaphi okhe wathetha nawo ngemeko yeHIV?

- Expects a numeric response (required)

Constraints
Response must be Less Than or Equal 'Sexual partners in previous year (8.3)'
Response must be Greater Than or Equal '0'

8.8 Knowledge of sexual partners other sexual relationships last year

...
Section 9. Partnerships – Current Sexual Behaviour

9.1 Current Partners Prompt

Kweli candela lilandelayo ndiza kukubuzi imibuzo ngeqabane okanye ngamaqabane odibene nawo ngesondo kutshanje. Kutshanje kuthetha nabani na okhe wadibana naye ngesondo kwiniyanga ezintathu eziqqithileyo.

9.2 Sexual partners last 3 months

Bangaphi abantu odibene nabo ngesondo ezinyangeni ezintathu eziqqithileyo?

9.3 Concurrent sexual partners last 3 months

Kwakha kwakho ixesha, ezinyangeni ezi-3 eziqqithileyo apho wawunamqabane esondo amabini okanye ngaphezu kvelo nani nxesha elinye? (Qaphela mPhathi wodi.mdilwano-nilbe: Ngaphezu kweqabane elinye nxeshe enhanye, akuthethwa ngeqela odibana nalo ngesondo).

Section 10. Partnerships - Current Sexual Behaviour (Part 2)

10.1 Partner HIV Status

Ngokokwazi kwakho, eli qabane linayo intsholongwane kaGawulayo eyi-HIV?

10.2 Discussed Own Status with Partner

Ingaba wena neqabane laikhobo benikhwe nathetha ngesimo sakho seNtsholongwane kaGawulayo?

10.3 Asked Partner to Test

Ulibungozile eli qabane ukuwa maliyokuxilongwa kakhangelwe intsholongwane i-HIV?
10.4 Partner had Other Partners

Ucinga ukuba eli qabane belinabo abanye ababhimqileyo ebabisabelana nababo ngesondono?

Expect a single option response (required)

- Ewe [1]
- Hayi [2]
- Andazi [99]

Translate to Xhosa: Decline to answer [91]

10.5 Partner Condom Use

Kumaxeshwa ogibele ngawo ali-10 okudibana kwakho ngesondo neli qabane, kuloo maxesha ali-10 uyisebenzise amaxesha angaphi iikhondom?

Expect a single option response (required)

- 0 [0]
- 1 [1]
- 2 [2]
- 3 [3]
- 4 [4]
- 5 [5]
- 6 [6]
- 7 [7]
- 8 [8]
- 9 [9]
- 10 [10]

Ndiyala ukuphendula [91]

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Section 11. Disclosure & Protection

Prerequisites
Skip when HIV test result (7.5) Not Equal 'HIV Positive [1']

11.1 Support Prompt

Enkosi. Kwimibuzo embalwana elandelayo ndiza kuthetha ngokunika ingxelo nangenkxaso, malungu nemeko yakho ye-HIV.

Prerequisites
Skip when HIV test result (7.5) Not Equal 'HIV Positive [1']

11.2 Able to disclose

Ukuba unqafuna ukuthetha ngemeko yakho ye-HIV, ubusenokuyenza loo nto?

Expect a single option response (required)

- Ewe [1]
- Hayi [2]
- Andiqinisekanga [99]

Ndiyala ukuphendula [95]

Prerequisites
Skip when HIV test result (7.5) Not Equal 'HIV Positive [1']
Skip when Current Partner BS2 (2.1) Not Equal 'Ewe [1']

11.3 Disclosed to Partner

Iqabane lakho sowukhe walecela ngemeko yakho ye-HIV?

Expect a single option response (required)

- Ewe [1]
- Hayi [2]
- Andinalo iqabane [3]
11.4 Disclosed to Family

Mangaphi amalungu osapho osele uwavelele ngemeko yakho ye-HIV?

Expects a numeric response (required)

Constraints
Response must be Greater Than or Equal '0'

11.5 Disclosed to Others

Ngaphandle kwabakowenu, bangaphi abantu bangaphandle obaxeleleyo ngemeko yakho ye-HIV?

Expects a numeric response (required)

Constraints
Response must be Greater Than or Equal '0'

11.6 Inform sister of status at delivery

Uziva uzhethemile ukuba ungaxelela umangikazi onguSister weklinikhi yakho ngemeko yakho ye-HIV xa usiya kubeleka usana?

Expects a single option response (required)
- Ewe [1]
- Hayi [2]
- Andiqinisekanga [99]
- Ndiyala ukuphendula [91]

11.7 Prevention of further infection

Njengoko sowuyazi imeko yakho, uzimisele ukuzikhusele njani ukuze ungabe uphinde usulelwe nge-HIV?

Expects multiple options (required)
- Thembeka [1]
- Sebenza iikhombon [2]
- Zila / yeka [3]
- Yiya kwingsilungo ye-HIV [4]
- Akukhonto [5]
- Enye into [95]
- Ndiyala ukuphendula [91]

11.8 Comfortable talking to partner

Kwezi meko zilandelayo yeiyphi, (ukuba ikhona) oziva ukuhulekile ukuthetha ngayo neqabane lakho?

Expects multiple options (required)
- Malunga nokukhulela [1]
- Malunga nentsholongwane i-HIV [2]
- Malunga nokuvela uncedo xa ulufuna [3]
- Malunga nokuthetha ngokungafihlisayo xa izinto zingalunganga [4]
- Malunga nokuyikelwa imeko yakho ye-HIV [5]
- Akukho nanye kwezi mpandulo zingentla [6]
- OKO AKUSEBENZI, andinalo iqubane [7]


11.9 Comfortable talking to clinic sister or nurse

Kwezi meko zilandelayo yeyiphi, (ukuha ikhona) oziva ukululekile ukuthetha ngayo nomongikazi okanye nosister weklinikhi yakho?

Expects multiple selected options (required)
- Malunga nokukhulelwana [1]
- Malunga nentshologwane i-HIV [2]
- Malunga nokucela uncedo xa ulunfana [3]
- Malunga nokuthetha ngokungaphihlisayo xa izinto zingalunganga [4]
- Malunga nokuyikela imeko yakho ye-HIV [5]
- Akukho nanye kwezi mpendulo zingentla [6]
- Ndiyala ukuphendula [91]

11.10 Comfortable talking to female relative/friend

Kwezi meko zilandelayo yeyiphi, (ukuha ikhona) oziva ukululekile ukuthetha ngayo nomama wakho/ nodadeweno osisizalwana okanye nomhlobokazi wakho?

Expects multiple selected options (required)
- Malunga nokukhulelwana [1]
- Malunga nentshologwane i-HIV [2]
- Malunga nokucela uncedo xa ulunfana [3]
- Malunga nokuthetha ngokungaphihlisayo xa izinto zingalunganga [4]
- Malunga nokuyikela imeko yakho ye-HIV [5]
- Akukho nanye kwezi mpendulo zingentla [6]
- Ndiyala ukuphendula [91]

11.11 Conflict due to status

Phakathi kwakho neqabane lakho, nixaebene kangakani emva kokuba uxilongwe wafunyaniswa ukuba une-HIV?

Expects a single option response (required)
- Ayikho [1]
- Kancinei [2]
- Kaninzi kakhulu. [3]
- Ini ati nkubeka [4]
- Ndiyala ukuphendula [91]

11.12 Conflict in the home

Ingakani ingxabano phakathi kwakho nabakowenu?

Expects a single option response (required)
- Ayikho [1]
- Kancinei [2]
- Kaninzi kakhulu. [3]
- Ini ati nkubeka [4]
- Ndiyala ukuphendula [91]

Section 12. Relationships and violence
12.1 Relationship Prompt

Imibuzo embalwa elandelayo imalunga nobudlelwane osenabo neqabane lakho.

12.2 Frequency quarrels

Kobu budlelwane usenabo, kukaninzi kanganakani unokutsho ukuba senikhe naxabana? Ungathi zange nixabane, kunqabile ukuxabana kwenu, ngamanye amaxesha niyaxabana okanye nixabana qho?

Expects a single option response (required)

- Zange [1]
- Kunqabile oko. [2]
- Ngamanye amaxesha [3]
- Yenzeka qho [4]

12.3 Talk about relationship to friend

Uyathetha nomhlolo wako okanye nesalamane sakho ngesengxaki zobudlelwane bakho?

Expects a single option response (required)

- Ewe [1]
- Hayi [2]

12.4 Quality current relationship

Ungatho ukuba ubudlelwane bakho buqaqambile, bulungile, buhle nje, okanye bonakele?

Expects a single option response (required)

- Ngokuqaqambileyo [1]
- Kakuhe [2]
- Kulungile [3]
- Akulunganga [4]

12.5 Violence Prompt

Amadoda alwa qho nezithandwa zawo eziiziintombi, le milo iba kukuthethwa emzimbeni kumaxesha amanini. Ndlizana kubuza imibuzo ngale nto ngoba sifuna ulwazi olulunuye ngamava abantu ababhinqileyo ebomini babo. Ndiduna ucthetha ngokukhulekileyo, yaye ukhumbule ukuba yonke into oyithethayo izakuba yimfihlelo.

12.6 Slap

Kwiinyanga ezili-12 ezigqithileyo, iqabane onalo ngoku okanye nasiphi na isithandwa sikubethile na ngempama okanye sikubethile ngento enokukwenzakalisa? Le nto yenzeka amaxesha amanini, amaxesha ambalwa, yenzeka kanye okanye khange yenzeke?

Expects a single option response (required)

- Zange [1]
- Kanye [2]
- Amakesha ambalwa [3]
- Kaninzi / amakesha amanini [4]

12.7 Shove

Kwiinyanga ezili-12 ezigqithileyo, iqabane onalo ngoku okanye nayiphili na indoda ikhe yakutychala na okanye yakusunduza? Le nto yenzeka amaxesha amanini, amaxesha ambalwa, yenzeka kanye okanye khange yenzeke?

Expects a single option response (required)

- Zange [1]
- Kanye [2]
12.8 Punch

Kwiinyanga ezilli-12 ezigqithileyo, iqabane onalo ngoku okanye nayiphi na indoda, ikhe yakubetha ngenqindi okanye ngenye into enokukwenzakalis? Le nto yenzeke amaxheshesha amaninzi, amaxheshesha amalawa, yenzeke kanye okanye khange yenzeke?

Requires a single option response (optional)

- Zange [1]
- Kanye [2]
- Amaxheshesha amalawa [3]
- Kaninzi / amaxheshesha amaninzi [4]

12.9 Weapon

Kwiinyanga ezilli-12 ezigqithileyo, iqabane onalo ngoku okanye nayiphi na indoda, ibikhe yakoyikisa na ngokuthi izi kusebenzisa umpho, imela okanye isinxhobo esinokukwenzakalis? Le nto yenzeke amaxheshesha amaninzi, amaxheshesha amalawa, yenzeke kanye okanye khange yenzeke?

Requires a single option response (optional)

- Zange [1]
- Kanye [2]
- Amaxheshesha amalawa [3]
- Kaninzi / amaxheshesha amaninzi [4]

Prerequisites
Skip when Slap (12.6) Not Equal Zange [1]
Skip when Shave (12.7) Not Equal Zange [1]
Skip when Punch (12.8) Not Equal Zange [1]
Skip when Weapon (12.9) Not Equal Zange [1]

12.10 No physical violence confirmation

Xa kunjalo kulungile na ukudidilile ukuba, kwiinyanga ezilli-12 ezigqithileyo, khange wenzakaliswe ngokwesizimbeni liqabane onalo ngoku okanye siso nasi phi na isithandwa?

Requires a single option response (required), Default: Ewe

- Ewe [1]
- Hayi [2]

Branches
If response Equals 'Ewe [1]' then skip to Antenatal Health Prompt (13.1)

12.11 Willing to Tell Most Recent Date

Ungakwzi ukusixela ngemini yokugqibela apho uthe waxabana neqabane lakho naphela nisilwa?

Requires a single option response (required)

- Ewe [1]
- Hayi [2]

Branches
If response Not Equal 'Ewe [1]' then skip to Number of violent episodes (12.13)

Prerequisites
Skip when No physical violence confirmation (12.10) Equals 'Ewe [1]'

12.12 Most recent violence

Ibileliphi elona xesha lakutshane apho ubukhe waphikisana nesithandwa sakho naza nabethana?

Requires a date response (optional)

12.13 Number of violent episodes

Kwiinyanga ezilli-12 ezigqithileyo, bezingaphi izihi indlela wena waphikisana neli qabane onalo ngoku nada nabethana?

Requires a numeric response (required)
Kwiinyanga ezintathu ezidlulileyo uqalise nini ukwenza umsebenzi wendlu?

**Expected a single option response (required)**

- Ewe [1]
- Hayi [2]
- Akusebenzi oko (ngoka andinalo iqabane) [3]
- Ndiyala ukuphendula [91]

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**Section 13. Baseline Knowledge – Antenatal Health**

**13.1 Antenatal Health Prompt**

Ngoku ndiza kukubuza imibuzo yakho phambi kokuba ufumane usana. Nangona usenokungabinazo iimpendulo zemibuzo yonke, needa uphendule umbuzo ngamnye ngendlela eyanelisayo.

**13.2 Ok to have little alcohol**

**INxelo: Kulungile ukuba umama okhulelwayo makasele utywala ukuze aphumle.**

**Expected a single option response (required)**

- Ndiyavuma [1]
- Andivumi [2]
- Andazi [3]
- Ndiyala ukuphendula [91]

**13.3 Weight gain is healthy**

**INxelo: Okukhona busongezeleleka ubunzima bomama okhulelwayo, kokuhona lusempilweni usana.**

**Expected a single option response (required)**

- Ndiyavuma [1]
- Andivumi [2]
- Andazi [3]
- Ndiyala ukuphendula [91]

**13.4 Vitamins Prompt**

Enkosi. Ngoku sibuzisa ngazo naziphi na iiivithamini okanye izimbiwa onokuba uyazitya.

**13.5 V&M Supplementation**

Xa ukhulelwayo uyazitya na naziphi na kwezi zinto zilandelayo?

**Expected multiple selected options (required)**

- i-multivitamini [1]
- Nyziphi na ivithamini ka-8 complex efumaneka emifumweni [2]
- Iqalisi / ayoni thonikh [3]
- Ikhalsiyam / yenza inxalenyi yanathambo namazinyo [4]
- Asiyiyo nanye kwezi [5]

**13.6 Milk and Dairy**

Kwivekilephelileyo, kukaniinzini khangakanani usitya ubisi nezinye izityo ezenziwe ngalo? (umzekelo: amasi, iyoghurt netshizi).

**Expected a numeric response (required)**

**Constraints**

*Response must be Greater Than or Equal '0'*

**13.7 Fruit and vegetables**
Kwiveki ephelileyo, kukaninzi kanganakanani usitya izihambisane?
Expects a numeric response (required)
Constraints
Response must be Greater Than or Equal '0'

13.8 Meats
Kwiveki ephelileyo, kukaninzi kanganakanani usitya iziyama? (umzekelo: eyenkuku, eyenkomo, eyehagu)
Expects a numeric response (required)
Constraints
Response must be Greater Than or Equal '0'

13.9 Fish
Kwiveki ephelileyo, kukaninzi kanganakanani usitya intlanzi?
Expects a numeric response (required)
Constraints
Response must be Greater Than or Equal '0'

13.10 Eggs
Kwiveki ephelileyo, kukaninzi kanganakanani usitya amaqanda?
Expects a numeric response (required)
Constraints
Response must be Greater Than or Equal '0'

13.11 Margarine and oil
Kwiveki ephelileyo, kukaninzi kanganakanani usitya imajini ne-oyille?
Expects a numeric response (required)
Constraints
Response must be Greater Than or Equal '0'

13.12 Sugar and chocolates
Kwiveki ephelileyo, kukaninzi kanganakanani usitya iswekile neetshokolethi?
Expects a numeric response (required)
Constraints
Response must be Greater Than or Equal '0'

13.13 Fizzy cold drinks
Kwiveki ephelileyo, kukaninzi kanganakanani usela iziselongo ezihambisane nezihlwahlwazayo?
Expects a numeric response (required)
Constraints
Response must be Greater Than or Equal '0'

13.14 Breads, samp and porridge
Kwiveki ephelileyo, kukaninzi kanganakanani usitya isonka, umngqusho ongenazimbo they neluswimi esiphekiweyo?
Expects a numeric response (required)
Constraints
Response must be Greater Than or Equal '0'
Section 14. Baseline Knowledge – Delivery Health

14.1 Delivery Prompt

Ngoku ndiza kukubuza imibuzo ngexesha oluza kuzalwa ngalo usana lwakho.

14.2 Know where will deliver

Uyazazi ukuha uza kubekilela kweliphi iziko lempilo?

Expects a single option response (required)

- Ewe [1]
- Hayi [2]
- Ndiyala ukuphendula [91]

Branches

If response Equals 'Hayi [2]' then skip to Post birth follow-up for mother (14.7)

Prerequisites

Skip when Know where will deliver (14.2) Not Equal 'Ewe [1]'

14.3 Delivery Facility

Nceda uzikhethele indaw oza kubekilela kuyo.

Expects a single option response (required)

- I-Michael Mapongwana Day Hospital [1]
- i-Site B Hospital / isiBhedelele saseSite B [2]
- isiBhedelele saseTygerberg [3]
- IMowbray Maternity Hospital / isiBhedelele sokuBelekisa esiseMowbray [4]
- Ikhaya (ngaphandle kwegibedlele) [5]
- IMpuma-Koloni [6]
- IBishop Laxia [7]
- Ezinye [95]

14.4 Travel means during day

Uyenzile indlela yokuya esibhedelele xa uqalisayo ukulunywa ngexesha lasemini?

Expects a single option response (required)

- Ewe [1]
- Hayi [2]
- Ndiyala ukuphendula [91]

14.5 Travel means during night

Uyenzile indlela yokufikelela esibhedelele xa uqalisayo ukulunyelwa ukuzala ngokuhlwa?

Expects a single option response (required)

- Ewe [1]
- Hayi [2]
- Ndiyala ukuphendula [91]

14.6 Delivery companion

Ukhona umantu oncelileyo ukuze akukhapho xa usiya kubekela?
14.7 Post birth follow-up for mother

Emva kokuba ubelekele, leliphi ixesha kanye elilandelayo umama alindeleke ngalo ukuba aye eklinihki?

14.8 Abahlobo

Oku kwenzelwa umPhathi wophiliwo-ndlebe: Nceda UNGAFUNDELI UKUBA MAWUVAKALE EBANTWINI: Eminye imibuzo izi kutsitywa ngoba ifanele kubhela oomama abaphenduleyo ngelithi banayo intsholongwane i-HIV.

15. Maternal Knowledge of Vertical Transmission

Prerequisites

Skip when HIV test result (7.5) Equals 'HIV Positive [1]'

15.1 Skip Section- Interviewer Instruction Only

Oku kwenzelwa umPhathi wophiliwo-ndlebe: Nceda UNGAFUNDELI UKUBA MAWUVAKALE EBANTWINI: Eminye imibuzo izi kutsitywa ngoba ifanele kubhela oomama abaphenduleyo ngelithi banayo intsholongwane i-HIV.

Branches

If response Equals 'Qhuba [1]' then skip to Baby Feeding Prompt (16.1)
If response Not Equal 'Qhuba [1]' then skip to Baby Feeding Prompt (16.1)

15.2 Medicine Prompt

Ngoku kukho imibuzo emalunga namayezana afanele wena nosana lwakho. Nangona usenokungabinazo iiimpendulo zemibuzo yonke, necda uphendule umbuzo ngamnye ngendlela eyancelisayo.

15.3 Maternal Knowledge Statements Prompt

Ngoku ndiza kukufulundela iingxelo. Nceda undixelele ukuba uyandivumela.

15.4 HIV+ mother «HIV» baby

IINGxelo: Ukuba umama unayo i-HIV, ngokuqinisekileyo nosana lwakhe lwakubanayo i-HIV.

15.5 Mothers can act to protect child

IINGxelo: Oomama abane-HIV akukho mpembelelo ingako banokubanayo ekunzukeleni iintsana zabo ukuze zingabinayo i-HIV.
16.6 Mixed feeding

**INGxelo:** Ukutya okuxutyiweyo usana lungekabi ludala khangangeyanga ezi-6 akunyusi mathuba okuba usana malufunyanwe yintshongwane i-HIV.

Expecta single option response (optional)

- Ewe / yinyaniso [1]
- Hayi / babuxoki [2]
- Andazi. [99]
- Ndiyala ukuphendula [91]

16.7 Healthy behaviours to protect baby

**[UMPHATHI WODLIWANO-NDLEBE: KULO MBUZO CELA UMAMA AKUXELELE UKUBA ZINTONI NA, FAKA UPHAWU KUZO ZONKE EZICHAPHAZELEKAYO]** Zintoni ezin unokuzenza uqinisekisa ukuba usana lwakho lwakuzalwa lungenayo i-HIV?

Expecta multiple selected options (required)

- Akukhonto [1]
- Sebenzisa kuphela indlela enye yokondla [2]
- Kukuncancisa qha [3]
- Kukuncancisa ngebhotile qha [4]
- Uqhaqho xa umama abeleka usana [5]
- Kangangeyanga ezili-t8 usana lunike i-cotrimoxazole [6]
- Ukunonophela iingono xo ndincancisayo [7]
- Makuyiwe kwingxilongo ye-HIV xa usana luludala ngeveke ezi-6 [8]
- Usana xa luvalwayo malunikwe i-NVP [9]
- Enye inta [95]
- Andazi [99]
- Ndiyala ukuphendula [91]

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**Section 16. Feeding Strategies and Prevention of Infections**

16.1 Baby Feeding Prompt


16.2 Feeding plan first 6 months

Usana lwakho uziphisele ukulondla njani kwinyanga zokuqala ezi-6 luzelwe?

Expecta a single option response (required)

- Ngokuncancisa kuphela [1]
- Ngesondlo seformula kuphela [2]
- Ngokuncancisa nange-formula (nokunye ukutya okufana nendengana, amanzi neglucose- isindlo esixutyiweyo) [3]
- Ndiyala ukuphendula [91]

Branches

If response Equals 'Ngokuncancisa kuphela [1]' then skip to *Routine Prompt (17.1)*

16.3 Formula feed resources

Xa unikwe ukuba ulungiselele isondlo seformula, (okanye isondlo esixutyiweyo), uyafilelela kuyo nayiphi na kwezi zinto zilandelayo?

Expecta multiple selected options (required)

- Imali okanye ezinye iindlela zokuza i-formula xa ingafumanekiyo ekliniiki [1]
- Amanzi aphuma endiwini yakho [2]
Section 17. Routines

17.1 Routine Prompt
Ngokuhambisile umsebenzi kuya kwiintsuka ezimbini ezidulileyo.

17.2 Wake-up time yesterday
Kusasa izolo uvukeyo ngaliphi ikesha?
Expect a time response (required)

17.3 Wake up time 2 days ago
Kwiintsuka ezimbini ezidulileyo uvukeyo ngaliphi ikesha?
Expect a time response (required)

17.4 Wake up time 3 days ago
Kwiintsuka ezintathu ezidulileyo uvukeyo nini?
Expect a time response (required)

17.5 Bed time yesterday
Izolo ngokuhla ulele ngaliphi ikesha?
Expect a time response (required)

17.6 Bed time 2 days ago
Kwiintsuka ezimbini ezidulileyo ulele ngaliphi ikesha?
Expect a time response (required)

17.7 Bed time 3 days ago
Kwiintsuka ezintathu ezidulileyo ulele nini?
Expect a time response (required)

17.8 Main meal yesterday
Isidlo esiyintloko usipheke ngaliphi ikesha izolo?
Expect a time response (required)

17.9 Main meal 2 days ago
Isidlo esiyintloko usipheke ngaliphi ikesha kwintsuka ezimbini ezidulileyo?
Expect a time response (required)

17.10 Main meal 3 days ago

---

* Umbane wokubilisa amanzo [3]
* Asiyiyo nanye kwezi [4]
* Ndiyala ukuphendula [91]
Isidlo esiyintloko usipheleli esisha kwintsuku ezintathu ezidulileyo?

17.11 Meal together yesterday

Izolo abakwenu ehemangaphi amakhe amabhinqile asebenzini kwintsuku ezintathu ezidlulileyo?

17.12 Meal together 2 days ago

Kwintsuku ezintathu ezidulileyo abakwenu ehemangaphi amakhathana kwintsuku ezintathu ezidlulileyo?

17.13 Meal together 3 days ago

Kwintsuku ezintathu ezidulileyo abakwenu ehemangaphi amakhathana kwintsuku ezintathu ezidlulileyo?

17.14 Household chores yesterday

Izolo uqalise nini ukuwenza umsebenzi wendlu?

17.15 Household chores 2 days ago

Kwintsuku ezintathu ezidulileyo uqalise nini ukuwenza umsebenzi wendlu?

17.16 Household chores 3 days ago

Kwintsuku ezintathu ezidulileyo uqalise nini ukuwenza umsebenzi wendlu?

17.17 Conflict at meal times

Ezintukwini ezintathu ezidulileyo ibingakanani ingxabano ngokusenda lokutya?

Section 18. Baseline Stated Future Plans

18.1 Future Plans Prompt

Ellicandelo lokugqibela lolu diliwano-nlebe. Ngoku ndiza kukubuza imibuzo ngezicwangeiso onazo zexesha elizayo.

18.2 Return to work

Uzimisele ukubuyela emsebenzini okanye esikolweni emva kokuba luezwe usana lwakho?
Clyral Support

Maternal Knowledge of Vertical Transmission

Baseline Knowledge Interview Identification past year

Section 18.

Section 10.

Baseline Part 2 (Xhosa)

18.2

17.4

14.4

14.1

8.7

7.2

6.6

6.3

5.1

Skip when

Skip when

Any partners engaged in HIV status discussion

Concurrent sexual partners past year

Previous LBW babies

Frequency of four or more drinks per day before knowledge of pregnancy

icandelo.

Expects a single option response (Xhosa)

Isidlo esiyintlo usipheke ngaliphi ixesha izolo?

Emva kokuba ubelelikile, leliphi ixesha kanye elilandelayo umama alindeleke ngalo ukuba aye eklinikhi?

Constraints

Expects a numeric response (Xhosa)

Constraints

Expects a single option response (Xhosa)

If response

Kobu budlelwane usenabo, kukaninzi kangakanani unokutsho ukuba senikhe naxabana? Ungathi zange nixabane, kunqabile ukuxabana kwenu, ngamanye

Khumbula ukuba iimpendulo zakho zakugcinwa ziyimfihlelo

Response must be

Constraints

Expects a numeric response (Xhosa)

Wakha waxilongelwa intsholongwane i

Constraints

Expects a single option response (Xhosa)

Ngamanye amaxesha ukhe usele kwakusasa xa usandula ukuvuka?

Constraints

Expects a single option response (Xhosa)

Kwezi meko zilandelayo yeyiphi, (ukuba ikhona) oziva ukhululekile ukuthetha ngayo nomongikazi okanye nosister weklinikhi yakho?

Constraints

Expects a single option response (Xhosa)

Kweli candela lilandelayo ndiza kukubuza imibuzo ngeqabane okanye ngamaqabane odibene nawo ngesondo kutshanje. Kutshanje kuthetha nabani na okhe

Constraints

Expects a single option response (Xhosa)

Mangaphi ekuthiwa a

Constraints

Expects a numeric response (Xhosa)

Wakha waxilongelwa intsholongwane i

Constraints

Expects a single option response (optional)

Ngamanye amaxesha ukhe usele kwakusasa xa usandula ukuvuka?

Constraints

Expects a single option response (optional)

Kwezi meko zilandelayo yeyiphi, (ukuba ikhona) oziva ukhululekile ukuthetha ngayo nomongikazi okanye nosister weklinikhi yakho?

Constraints

Expects a single option response (optional)

Kweli candela lilandelayo ndiza kukubuza imibuzo ngeqabane okanye ngamaqabane odibene nawo ngesondo kutshanje. Kutshanje kuthetha nabani na okhe

Constraints

Expects a single option response (optional)

Mangaphi ekuthiwa a

Constraints

Expects a numeric response (Xhosa)

Bed time yesterday

Travel means during night

Violence Prompt

Disclosed to Others

Disclosed to Partner

Discussed Own Status with Partner

Memory loss with alcohol

Frequency of three or more drinks per day after knowledge of pregnancy

Section 19. End of Survey

19.1 Voucher given

Umthathi-nxaxheba uyinikiwe na ivawutsha ye-R80 ukuze athenge ukutya?

Expects a single option response (required)

é Ewe [1]

é Hayi [2]

19.2 End

Ufikelele esihleweni solu phando. Ungabuyela emva uhlolisisile indlela obuphendule ngayo okanye ungazikhethela OLULANDELOYO ukuze uqibezele icandelo.
APPENDIX C
### Questions used from PMMS for this sub-study from baseline questionnaire

<table>
<thead>
<tr>
<th>Questions to be used from part 1 of baseline assessment (both English and Xhosa versions) for this sub-study</th>
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<td>9.8 and 9.9</td>
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</tbody>
</table>
Section 1. Participant Identifier

1.1 Participant ID

Please enter the participants unique identifier code:

Expects a numeric response (required)

1.2 Interviewer code

Please enter your interviewer code:

Expects a numeric response (required)

1.3 Neighbourhood code

Please enter the neighbourhood code:

Expects a numeric response (required)

1.4 Date of Interview

Please confirm the date of this interview:

Expects a date response (required)

1.5 Time of Interview

Please confirm the time of this interview:

Expects a time response (required)

1.6 Address

Please enter the participant's address:

Expects a single line text response (required)

Section 2. Informed Consent

2.1 Informed consent granted

Was the informed consent form explained and accepted?

Expects a single option response (required)

- Yes [1]
- No [2]

Branches

If response Equals "Yes [1]" then skip to Infant birth count (3.1)

2.2 Refusal reason

If mother refuses to participate note the reason for non-participation:

Expects a single option response (required)

- Fear of stigma [1]
- No reason given [2]
Section 3. Baby - Birth

3.1 Infant birth count

How many infants did you give birth to?

Expects a numeric response (required)

Section 4. Baby – Demographics

4.1 Demographics Prompt

Now I have a few questions about the baby and your delivery at the hospital or birth facility.

4.2 Delivery facility

At what hospital was the baby delivered?

Expects a single option response (required)

- Michael Mapongwana Day Hospital
- Site B Hospital
- Tygerberg Hospital
- Mowbray Maternity Hospital
- Home (outside hospital)
- Eastern Cape
- Bishop Lavis
- Other

4.3 Delivery Type

Type of delivery:

Expects a single option response (required)

- Vaginal
- Cesarian

4.4 Birth hospital duration

How many days did you spend in the hospital?

Expects a single option response (required)

- Less than 1 day
- 1 day
- More than one day

4.5 Baby spent more than 24 hrs hospital

Did your baby spend more than 24 hours in hospital?

Expects a single option response (required)

- Yes
- No
4.6 Baby hospital duration

How many days did your baby spend in the hospital?

*Requires a single option response (required)*

- Less than 3 days [1]
- More than 3 days, less than 2 weeks [2]
- More than 2 weeks [3]

4.7 Baby Birth Date

On what date was your baby born?

*Requires a date response (required)*

4.8 Baby Gender

Is your baby a boy or a girl?

*Requires a single option response (required)*

- Male [1]
- Female [2]

4.9 Baby Current Weight

Baby's current weight (kg):

*Requires a numeric response (required)*

**Constraints**

- Response must be Greater Than or Equal '0'
- Response must be Less Than or Equal '15'

4.10 Baby Current Length

Baby's current length (cm):

*Requires a decimal response (required)*

**Constraints**

- Response must be Greater Than or Equal '15'
- Response must be Less Than or Equal '100'

4.11 Baby Current Head Circumference

Enter babys current head circumference (cm):

*Requires a decimal response (required)*

**Constraints**

- Response must be Greater Than or Equal '10'
- Response must be Less Than or Equal '100'

4.12 Clinic Card Available

Is your babys clinic card available for me to have a look at?

*Requires a single option response (required)*

- Yes [1]
- No [2]

**Branches**

- If response equals 'No [2]' then skip to Feeding prompt (5.1)

4.13 Apgar Score (1min)

Apgar score (1 minute):

*Requires a numeric response (optional)*
4.14 Apgar score (5 min)

Apgar score (5 minutes):

Expects a numeric response (optional)

4.15 Birth Weight

Birth weight (kg):

Expects a decimal response (optional)

Constraints
Response must be Greater Than or Equal '0'
Response must be Less Than or Equal '10'

4.16 Birth Length

Birth length (crown-heel) (cm):

Expects a decimal response (optional)

Constraints
Response must be Greater Than or Equal '0'
Response must be Less Than or Equal '100'

4.17 Baby Birth Head Circumference

Enter babys head circumference at birth (cm):

Expects a decimal response (optional)

Constraints
Response must be Greater Than or Equal '0'
Response must be Less Than or Equal '100'

Section 5. Feeding

5.1 Feeding prompt

Thank you. Now I have a few questions about how you are feeding your baby.

5.2 Breast Milk Ever

Have you ever given your baby breast milk?

Expects a single option response (required)

- Yes [1]
- No [2]

Branches
If response Equals 'No [2]' then skip to Feeding items (5.8)

5.3 Breast after birth

Did you put your baby to the breast immediately after it was born?

Expects a single option response (required)

- Yes [1]
- No [2]

5.4 Fed colostrum

Did you feed your baby the first milk from your breast?
5.5 When baby start breast milk

When did you put the baby to the breast immediately after it was born?

Expects a single option response (required)
- Yes [1]
- After the first hour [1]
- After the first hour and up to 12 hours [2]
- After 12 hours and up to 24 hours [3]
- After 24 hours and up to 48 hours (2nd day) [4]
- After 48 hours and up to 72 hours (3rd day) [5]
- After 72 hours (after the 3rd day) [6]

5.6 Breast problem

Have you had any infection, or problem with your breasts since the child has been born?

Expects a single option response (required)
- Yes [1]
- No [2]

Branches
If response Equals 'No' then skip to Feeding items (5.8)

5.7 Type breast problem

What problems did you have?

Expects multiple selected options (required)
- Engorgement [1]
- Cracked nipples [2]
- Painful nipples [3]
- Bleeding nipples [4]
- Full, lumpy, painful breasts [5]
- Red, painful nipples with fever [6]
- Other [95]

5.8 Feeding items

Have you ever given your baby any of the following items?

Expects multiple selected options (required)
- Water [1]
- Water with sugar or glucose [2]
- Fruit Juice [3]
- Herbs [4]
- Tea without milk [5]
- Tea with milk [6]
- Rice water [7]
- Diluted cows milk [8]
- Non diluted cows milk [9]
- Infant formula [10]
- Other powdered milk [11]
- Goats milk [12]
- Cereals, porridge or bread [13]
- Fruits/ Vegetables [14]
- Meat [15]
- Fish [16]
- Eggs [17]
5.9 Other responsible feeding choice

Was anyone else responsible for making a decision on how to feed your baby?

- Yes [1]
- No [2]

5.10 Person responsible

Who was responsible?

- Partner / Husband [1]
- Mother in law [2]
- Mother [3]
- Nurse [4]
- Other [5]

Section 6. Child Care

6.1 Child Care Prompt

Now there are a few questions about child care issues and business things to do as a mother.

6.2 Child registration

Did you register the baby's birth?

- Yes [1]
- No [2]
- Don't Know [99]
- Decline to answer [91]

Branches

If response Not Equal "Yes [1]" then skip to Help when unavailable (6.4)

6.3 Birth Certificate

Does your baby have a birth certificate?

- Yes [1]
- No [2]
- Don’t Know [99]
- Decline to answer [91]
Section 7. Father of the child

7.1 Father of Child Prompt

Now I have one question about the father of your child.

7.2 Father acknowledged baby

Has the father of this baby acknowledged the baby to his family?

Expects a single option response (required)

- Yes [1]
- No [2]
- Don’t Know [99]
- Decline to answer [91]

Section 8. Mental Health (EPDS)

8.1 Thoughts and Feelings Prompt

Now I have some questions to ask about your feelings over the last week. Please state the answer which comes closest to how you have felt IN THE PAST 7 DAYS, not just how you feel today.

8.2 Laugh

I have been able to laugh and see the funny side of things.

Expects a single option response (required)

- As much as I always could [0]
- Not quite so much now [1]
- Definitely not so much now [2]
- Not at all [2]

8.3 Enjoyment

I have looked forward with enjoyment to things.

Expects a single option response (required)

- As much as I ever did [0]
- Rather less than I used to [1]
- Definitely less than I used to [2]
- Hardly at all [3]

8.4 Self Blame

I have blamed myself unnecessarily when things went wrong.

Expects a single option response (required)

- Yes, most of the time [2]
- Yes, some of the time [2]
- Not very often [1]
- No, never [0]
8.5 Anxious/worry

I have been anxious or worried for no good reason.

Expects a single option response (required)
- No, not at all [0]
- Hardly ever [1]
- Yes, sometimes [2]
- Yes, very often [3]

8.6 Panicky

I have felt scared or panicky for not very good reason.

Expects a single option response (required)
- Yes, quite a lot [3]
- Yes, sometimes [2]
- No, not much [1]
- No, not at all [0]

8.7 Things piled up

Things have been getting on top of me.

Expects a single option response (required)
- Yes, most of the time I haven’t been able to cope at all [3]
- Yes, sometimes I haven’t been coping as well as usual [2]
- No, most of the time I have coped quite well [1]
- No, I have been coping as well as ever [0]

8.8 Difficulty sleeping

I have been so unhappy that I have had difficulty sleeping

Expects a single option response (required)
- Yes, most of the time [3]
- Yes, sometimes [2]
- Not very often [1]
- No, not at all [0]

8.9 Sad/miserable

I have felt sad or miserable

Expects a single option response (required)
- Yes, most of the time [3]
- Yes, sometimes [2]
- Not very often [1]
- No, not at all [0]

8.10 Crying

I have been so unhappy that I have been crying.

Expects a single option response (required)
- Yes, most of the time [3]
- Yes, quite often [2]
- Only occasionally [1]
- No, never [0]

8.11 Self harm

The thought of harming myself has occurred to me.

Expects a single option response (required)
- Yes, quite often [3]
Section 9. Mental Health (GHQ)

9.1 GHQ Prompt

We would like to know how your health has been in general OVER THE PAST FEW WEEKS. Please answer ALL the questions simply by stating which answer most closely applies to you OVER THE PAST FEW WEEKS. Remember that we want to know about PRESENT AND RECENT (Interviewer prompt: over the past few weeks since the month and dates you want to discuss) complaints, not those you had in the past. It is important that you try to answer all the questions.

9.2 GHQ Concentrate

Have you been able to concentrate on whatever you're doing?

Expects a single option response (required)

- Better Than usual [3]
- Same as usual [2]
- Less than usual [1]
- Much less than usual [0]

9.3 GHQ Lost sleep

Have you recently lost much sleep over worry?

Expects a single option response (required)

- Not at all [3]
- No more than usual [2]
- Rather more than usual [1]
- Much more than usual [0]

9.4 GHQ Useful part

Have you recently felt that you are playing a useful part in things?

Expects a single option response (required)

- More so than usual [3]
- Same as usual [2]
- Less useful than usual [1]
- Much less useful [0]

9.5 GHQ Decisions

Have you recently felt capable of making decisions about things?

Expects a single option response (required)

- More so than usual [3]
- Same as usual [2]
- Less so than usual [1]
- Much less capable [0]

9.6 GHQ Under strain

Have you recently felt constantly under strain?

Expects a single option response (required)

- Not at all [3]
- No more than usual [2]
- Rather more than usual [1]
- Much more than usual [0]
Have you recently felt you couldn’t overcome your difficulties?

Expected a single option response (required)

- Not at all [3]
- No more than usual [2]
- Rather more than usual [1]
- Much more than usual [0]

Have you recently been able to enjoy your normal day-to-day activities?

Expected a single option response (required)

- More than usual [3]
- Same as usual [2]
- Less so than usual [1]
- Much less than usual [0]

Have you recently been able to face up to your problems?

Expected a single option response (required)

- More than usual [3]
- Same as usual [2]
- Less than usual [1]
- Much less able [0]

Have you recently been feeling unhappy and depressed?

Expected a single option response (required)

- Not at all [3]
- No more than usual [2]
- Rather more than usual [1]
- Much more than usual [0]

Have you recently been losing confidence in yourself?

Expected a single option response (required)

- Not at all [3]
- No more than usual [2]
- Rather more than usual [1]
- Much more than usual [0]

Have you recently been thinking of yourself as a worthless person?

Expected a single option response (required)

- Not at all [3]
- No more than usual [2]
- Rather more than usual [1]
- Much more than usual [0]

Have you recently been feeling reasonably happy, all things considered?

Expected a single option response (required)

- More than usual [3]
- About the same as usual [2]
Section 10. Enjoyable activities

10.1 Past month enjoyable activities

In the past month, how often did you do enjoyable or relaxing things just for yourself such as watching TV, going to church, having your hair done?

Expects a single option response (required)

- Never [1]
- Once or twice a week [2]
- Several times a week [3]
- Daily [4]

10.2 Favourite Colour

What is your favourite colour?

Expects a single line text response (required)

Section 11. General health

11.1 Self regarded health - mother

How do you regard your general health?

Expects a single option response (required)

- Very Good [1]
- Good [2]
- Fair [3]
- Poor [4]

11.2 Standard Diabetes - mother

Were you diagnosed with Diabetes before pregnancy?

Expects a single option response (required)

- Yes [1]
- No [2]
- Decline to answer [91]

Branches
If response Not Equal 'Yes [1]' then skip to Gestational diabetes - mother (11.5)

11.3 Standard Diabetes medication - mother

Do you receive medication for your Diabetes?

Expects a single option response (required)

- Yes [1]
- No [2]
- Decline to answer [91]

Branches
If response Equals 'No [2]' then skip to Gestational diabetes - mother (11.5)

11.4 Standard Diabetes TYPE medication - mother

Are you treated with tablets or injections for your Diabetes?

Expects a single option response (required)

- Tablets [1]
- Injections [2]
### 11.5 Gestational diabetes - mother

Were you diagnosed with Gestational Diabetes during pregnancy?

- Expect a single option response (required)
  - Yes [1]
  - No [2]
  - Decline to answer [91]

Branches
- If response Not Equal "Yes [1]" then skip to Standard hypertension - mother (11.7)

### 11.6 Gestational Diabetes medication - mother

Do you receive insulin for your Gestational Diabetes?

- Expect a single option response (required)
  - Yes [1]
  - No [2]
  - Decline to answer [91]

### 11.7 Standard hypertension - mother

Were you diagnosed with Hypertension before falling pregnant?

- Expect a single option response (required)
  - Yes [1]
  - No [2]
  - Decline to answer [91]

### 11.8 Gestational hypertension – mother

Were you diagnosed with Hypertension during pregnancy?

- Expect a single option response (required)
  - Yes [1]
  - No [2]
  - Decline to answer [91]

### 11.9 Hypertension medication - mother

Are you taking medication for your Hypertension at present?

- Expect a single option response (required)
  - Yes [1]
  - No [2]
  - Decline to answer [91]

### 11.10 Other medication

Are you taking medication for any other disease at present?

- Expect a single option response (required)
  - Yes [1]
  - No [2]
  - Decline to answer [91]

### 11.11 Post birth conditions - mother

Since the birth of your child, have you had any of the following?

- Expect multiple selected options (required)
  - Heavy vaginal bleeding [1]
  - Bad smelling discharge [2]
  - Temperature [3]
  - Persistent cough [4]
  - Breast infection [5]
  - Other [95]
11.12 Traditional medicine - mother

Please tell us which of the following, if any, you have used since the time of your last assessment.

Expects multiple selected options (required)

- Enemas [1]
- Traditional vitamins or supplements in liquid [2]
- Medicines for social health (e.g. love potions, bewitchment) [3]
- Medicines for pregnancy (e.g. pregnancy enemas, contraction stimulants) [4]
- Medicines for spiritual health (e.g. liquids for protecting baby) [5]
- Medicines for children (muti wenyoni, lennon 's medicines) [6]
- Decline to answer [91]
- None [7]

11.13 Infant health perception

Is your child feeding well?

Expects a single option response (required)

- Yes [1]
- No [2]
- Decline to answer [91]

11.14 Infant illness

Has your child been sick since birth?

Expects a single option response (required)

- Yes [1]
- No [2]
- Decline to answer [91]

Branches

If response Not Equal 'Yes [1]' then skip to Crying lots (11.17)

11.15 Type infant illness

In which way has your child been sick?

Expects multiple selected options (required)

- Diarrhoea [1]
- Vomiting [2]
- Temperature [3]
- Rash [4]
- Skin infection [5]
- Infection of umbilicus [6]
- Fits [7]
- Cough [8]
- Yellow jaundice [9]
- Stomach cramps [10]
- Other [95]

11.16 Seek health care – infant

Did you take your child to the clinic or doctor for this/these health problems?

Expects a single option response (required)

- Yes [1]
- No [2]

11.17 Crying lots

Do you feel your child is crying more than what you think is normal?
Section 12. TB

12.1 Participant TB

Since our last meeting have you tested positive for TB?

Expect a single option response (required)

- Yes [1]
- No [2]
- Decline to answer [91]

Branches

If response Not Equal 'Yes [1]' then skip to Participant HH TB (12.3)

12.2 Participant TB Treatment

Are you currently receiving treatment?

Expect a single option response (required)

- Yes [1]
- No [2]
- Decline to answer [91]

12.3 Participant HH TB

Since our last meeting has anybody ELSE (that we haven’t already spoken about) in your household had a diagnosis of TB?

Expect a single option response (required)

- Yes [1]
- No [2]
- Don’t Know [99]
- Decline to answer [91]

Branches

If response Not Equal 'Yes [1]' then skip to Tobacco use (13.1)

12.4 Participant HH TB Treatment

Are they currently receiving treatment for TB?

Expect a single option response (required)

- Yes [1]
- No [2]
- Don’t Know [99]
- Decline to answer [91]

Section 13. Substances

13.1 Tobacco use

Did you use any tobacco during pregnancy?

Expect a single option response (required)

- Yes [1]
- No [2]
- Decline to answer [91]

Branches

If response Not Equal 'Yes [1]' then skip to Tik (13.3)
Section 14. Alcohol

14.1 Alcohol Prompt

Thank you. Now I would like to ask you a few questions about alcohol. Please remember that all of your answers will be kept secret.
14.3 Participant Alcohol Drinking Volume - Pre-birth Month

Within the last month, before your baby was born, counting all types of alcohol combined, how many drinks did you USUALLY have on days when you drank alcohol?

Expects a single option response (required)

- 1 or 2 [0]
- 3 or 4 [1]
- 5 or 6 [2]
- 7, 8 or 9 [3]
- 10 or more [4]

14.4 Participant Alcohol 4+ Drinks Frequency - Pre-birth Month

Within the last month, before your baby was born, about how often did you drink FOUR or MORE drinks in a single day?

Expects a single option response (required)

- Never [0]
- Less than once a month [1]
- Once a month [2]
- 2 to 3 times a month [3]
- Once a week [4]
- 2 times a week [5]
- 3 to 4 times a week [6]
- Nearly every day [7]
- Every day [8]

14.5 Participant Alcohol 3+ Drinks Frequency - Pre-birth Month

Within the last month, before your baby was born, about how often did you drink THREE or MORE drinks in a single day?

Expects a single option response (required)

- Never [0]
- Less than once a month [1]
- Once a month [2]
- 2 to 3 times a month [3]
- Once a week [4]
- 2 times a week [5]
- 3 to 4 times a week [6]
- Nearly every day [7]
- Every day [8]

14.6 Participant Alcohol Drinking Frequency - Post Birth

Now that your baby is born, about how often do you drink ANY alcoholic beverage?

Expects a single option response (required)

- Never [0]
- Less than once a month [1]
- Once a month [2]
- 2 to 3 times a month [3]
- Once a week [4]
- 2 times a week [5]
- 3 to 4 times a week [6]
- Nearly every day [7]
- Every day [8]

Branches

If response Equals 'Never [0]' then skip to Sexual Partner Prompt (15.1)
Now that your baby is born, counting all types of alcohol combined, how many drinks do you USUALLY have on days when you drink alcohol?

- 1 or 2 [0]
- 3 or 4 [1]
- 5 or 6 [2]
- 7, 8 or 9 [3]
- 10 or more [4]

14.8 Participant Alcohol 4+ Drinks Frequency - Post Birth

Now that your baby is born, about how often do you drink FOUR or MORE drinks in a single day?

- Never [0]
- Less than once a month [1]
- Once a month [2]
- 2 to 3 times a month [3]
- Once a week [4]
- 2 times a week [5]
- 3 to 4 times a week [6]
- Nearly every day [7]
- Every day [8]

14.9 Participant Alcohol 3+ Drinks Frequency - Post Birth

Now that your baby is born, about how often do you drink THREE or MORE drinks in a single day?

- Never [0]
- Less than once a month [1]
- Once a month [2]
- 2 to 3 times a month [3]
- Once a week [4]
- 2 times a week [5]
- 3 to 4 times a week [6]
- Nearly every day [7]
- Every day [8]

14.10 Participant Number Drinks High

How many drinks does it take to make you feel high?

Expect a numeric response (required)

14.11 Participant External Alcohol Concern

Have close friends or relatives worried or complained about your drinking?

- Yes [1]
- No [2]

14.12 Participant Drink Morning

Do you sometimes take a drink in the morning when you first get up?

- Yes [1]
- No [2]

14.13 Participant Alcohol Memory Loss

Has a friend or family member ever told you about things you said or did while you were drinking that you could not remember?
Section 15. Sexual Partner

15.1 Sexual Partner Prompt

In the following questions I will be asking you about the last person you have had sex with.

15.2 Sexual Partner Been for HIV Test

Do you know if your sexual partner has been for a HIV test?

Expects a single option response (required)

- Yes [1]
- No [2]
- Don’t Know [99]
- Decline to answer [91]

Branches

If response Not Equal “Yes [1]” then skip to Asked Sexual Partner to Test (15.4)

15.3 Sexual Partner HIV Status

What is his HIV status?

Expects a single option response (required)

- Positive [1]
- Negative [2]
- Don’t Know [99]
- Decline to answer [91]

15.4 Asked Sexual Partner to Test

Have you asked him to go for a HIV test?

Expects a single option response (required)

- Yes [1]
- No [2]
- Decline to answer [91]

15.5 Could Ask Sexual Partner to Test

Could you ask him to go for a HIV test?

Expects a single option response (required)

- Yes [1]
- No [2]
- Decline to answer [91]

15.6 Sexual Partner Involved Other Women

Do you think your sexual partner is involved with any other women?

Expects a single option response (required)

- Yes [1]
Section 16. Antenatal Clinic Visits & HIV Testing

16.1 Clinic sessions

How many antenatal clinic visits did you attend where you saw a health care worker?

Expects a numeric response (required)

16.2 Tested HIV in Antenatal Care

In this pregnancy were you tested for HIV during antenatal care?

Expects a single option response (required)

16.3 HIV Positive

Are you HIV Positive (confirmatory and / or if status changed since baseline)?

Expects a single option response (required)

Section 17. HIV Medication

17.1 Disclosed at Hospital

Did you tell any of the health care staff at the hospital you were HIV positive?

Expects a single option response (required)
17.2 AZT Usage Prior to Labour

Please tell me about when you started, stopped, and how many times a day you took AZT prior to going into labour: (INTERVIEWER NOTE: Participants started AZT at any point from 28 weeks. She took one tablet twice a day for the entire period without skipping any days. SCORE AS COMPLETE. If she stopped taking the tablets before going into labour for any reason, SCORE AS INCOMPLETE. If she skipped any days between 28 weeks and labour or stopped and resumed treatment. SCORE AS INTERRUPTED.)

Expects a single option response (required)
- Complete [1]
- Incomplete [2]
- Interrupted [3]
- Declined to answer [91]

17.3 Medication to Prevent HIV Transmission

Did you take your medication to prevent HIV transmission during labour?

Expects a single option response (required)
- Yes [1]
- No [2]
- Unsure [99]
- Decline to answer [91]

Branches
If response Not Equal "Yes [1]" then skip to NVP Tablet at Onset of Labour (17.5)

17.4 AZT Usage During Labour

Please tell me about when you started, stopped, and at what time intervals you took AZT once you went into labour: (INTERVIEWER NOTE: Start AZT 3 hourly for the duration of labor - SCORE AS COMPLETE. If did not meet 3 hour frequency criteria SCORE AS INCOMPLETE. If missed less than 2 of the 3 hourly doses but did increase dose frequency then SCORE AS INTERRUPTED.)

Expects a single option response (required)
- Complete [1]
- Incomplete [2]
- Interrupted [3]
- Declined to answer [91]

17.5 NVP Tablet at Onset of Labour

Did you take one NVP tablet at the onset of labour?

Expects a single option response (required)
- Complete [1]
- Incomplete [2]
- Declined to answer [91]

17.6 NVP Syrup Within 24h

Was your baby given a dose of NVP syrup within 24 hours of birth? (INTERVIEWER NOTE: Baby got a stat dose of NVP within 24 hours after delivery SCORE AS COMPLETE. Did not get stat dose after delivery SCORE AS INCOMPLETE. Baby got a stat dose of NVP more than 24 hours after delivery SCORE AS DELAYED.)

Expects a single option response (required)
- Complete [1]
- Incomplete [2]
- Delayed [3]
- Declined to answer [91]

17.7 AZT Dispensed
Were you given AZT for your baby?

**Expects a single option response (required)**

- Yes [1]
- No [2]
- Decline to answer [91]

**Branches**

If response Not Equal "Yes [1]" then skip to Disclosure and Protection Prompt (18.1)

17.8 AZT Course Length

What was the length of the course you were prescribed?

**Expects a single option response (required)**

- 7 days [1]
- 28 days [2]
- Other [95]
- Don’t know [99]

17.9 Medicating as Prescribed

Have you been giving the baby its medication as prescribed?

**Expects a single option response (required)**

- Yes [1]
- No [2]
- Decline to answer [91]

---

**Section 18. Disclosure and Protection**

18.1 Disclosure and Protection Prompt

Thank you. This is the last section of the interview. I just have a few short questions now about HIV disclosure.

18.2 Able to disclose

If you wanted to disclose your HIV status would you be able to?

**Expects a single option response (required)**

- Yes [1]
- No [2]
- Unsure [99]
- Decline to answer [95]

18.3 Disclosed to Partner

Have you disclosed you HIV status to your partner?

**Expects a single option response (required)**

- Yes [1]
- No [2]
- Has no partner [3]
- Decline to answer [91]

18.4 Number family disclosed

How many family members have you disclosed to?

**Expects a numeric response (required)**

18.5 Number people outside family disclosed to

How many people outside your family have you disclosed to?

**Expects a numeric response (required)**
18.6 Worry church disclosure

Would you be worried about your church learning you were HIV positive?
Expect a single option response (required)
- Yes [1]
- No [2]
- Unsure [3]
- Not applicable – no church [4]
- Declined to answer [91]

18.7 Participant Comfortable Disclosing Partner

Please select which of the following (if any) you feel comfortable talking to your PARTNER about:
Expect multiple selected options (required)
- Pregnancy [1]
- HIV [2]
- Asking for help when you need it [3]
- Speaking up when things are wrong [4]
- Revealing your HIV status [5]
- Has no partner [6]
- None of the above [7]

18.8 Participant Comfortable Disclosing Clinic Nurse

Please select which of the following (if any) you feel comfortable talking to a NURSE / CLINIC STAFF MEMBER about:
Expect multiple selected options (required)
- Pregnancy [1]
- HIV [2]
- Asking for help when you need it [3]
- Speaking up when things are wrong [4]
- Revealing your HIV status [5]
- None of the above [6]

18.9 Participant Comfortable Disclosing Female Relative/Friend

Please select which of the following (if any) you feel comfortable talking to your MOTHER / SISTER / FEMALE RELATIVE / FEMALE FRIEND about:
Expect multiple selected options (required)
- Pregnancy [1]
- HIV [2]
- Asking for help when you need it [3]
- Speaking up when things are wrong [4]
- Revealing your HIV status [5]
- None of the above [6]

Section 19. End of Survey

19.1 Voucher given

Was the participant given R80 food voucher?
Expect a single option response (required)
- Yes [1]
- No [2]
Section 1. Participant Identifier

1.1 Participant ID

Nceda ubhale iikhwadi ekhethekileyo nemchongayyo umthathi-ixaXheba:

Expecta numeric response (required)

1.2 Interviewer code

Nceda ubhale iikhwadi yomphathi wodlwano-ndlebe:

Expecta numeric response (required)

1.3 Neighbourhood code

Nceda ubhale iikhwadi yommelwane:

Expecta numeric response (required)

1.4 Date of Interview

Nceda ugnisekise ngomhla wolwolwano-ndlebe:

Expecta date response (required)

1.5 Time of Interview

Nceda ugnisekise ngesexha lodlwano-ndlebe:

Expecta time response (required)

1.6 Address

Nceda ubhale idilesi yomthathi-ixaXheba:

Expecta single line text response (required)

Section 2. Informed Consent

2.1 Informed consent granted

Inikiwe inkezelo ngemvumo yengqiqo yaza yamkelwa?

Expecta single option response (required)

- Ewe [1]
- Hayi [2]

Branches

If response Equals "Ewe [1]" then skip to Infant birth count (3.1)

2.2 Refusal reason

Ukuba umama uyalu ukuthatha inXheba, bhala isizathu sokuwala kwakhe:

Expecta single option response (required)

- Kukoyika ibhala [1]
- Akukho sizathu sibekwwe [2]
Section 3. Baby - Birth

3.1 Infant birth count

Uzale abantwana abangaphi?

Expects a numeric response (required)

Repeat this section for value of Infant birth count (3.1)

Section 4. Baby – Demographics

4.1 Demographics Prompt

Ngoku ndinemibuzo embalwa ngosana nokulubeleka kwakho esibhedelele.

4.2 Delivery facility

Ubulubelekele kwesiphi isibhedelele?

Expects a single option response (required)

- I-Michael Mapongwana Day Hospital [1]
- Isibhedelele saseSite B [2]
- Isibhedelele saseTygerberg [3]
- Isibhedelele sokuBuleleka esiseMowbray [4]
- Ekhaya Home (ngaphandle kwesibhedelele) [5]
- Mpuma-Koloni [6]
- IBishop Lavis [7]
- Enye [99]

4.3 Delivery Type

Ulubelekele njani:

Expects a single option response (required)

- Ukusa ngasesizalweni [1]
- Okwenzeke nguqhaqho [2]

4.4 Birth hospital duration

Esibhedelele uhlahiswe intsku ezingaphi?

Expects a single option response (required)

- kungaphantsi kwimini enye [1]
- usuku olunye [2]
- Ngaphezulu kosuku olunye [3]

4.5 Baby spent more than 24 hrs hospital

Usana ikwakho luhlele esibhedelele iiyure ezingaphezulu kwezingama-24?

Expects a single option response (required)

- Ewe [1]
- Hayi [2]
4.6 Baby hospital duration

Zinga inyentsu usana lwakho lugcinwe esibhedele?

Expects a single option response (required)

- ngaphantsi kweentsuku ezi-3 [1]
- ngaphenzu kweentsuku ezi-3, ngaphantsi kweveki ezi-2 [2]
- ngaphenzu kweveki ezi-a [3]

4.7 Baby Birth Date

Lazwelwe ngowuphi umhla usana lwakho?

Expects a date response (required)

4.8 Baby Gender

Luyinkwenkwe okanye luyintombazana?

Expects a single option response (required)

- Yindoda [1]
- Libhinqa [2]

4.9 Baby Current Weight

Ngoku bungakanani ubunzima bosana ngokweekilogrem?:

Expects a numeric response (required)

Constraints
- Response must be Greater Than or Equal '0'
- Response must be Less Than or Equal '15'

4.10 Baby Current Length

Ngoku lude kangakanani usanangokweesentimitha?:

Expects a decimal response (required)

Constraints
- Response must be Greater Than or Equal '15'
- Response must be Less Than or Equal '100'

4.11 Baby Current Head Circumference

Singakanani isazinge sentloko yosana ngokweesentimitha?:

Expects a decimal response (required)

Constraints
- Response must be Greater Than or Equal '10'
- Response must be Less Than or Equal '100'

4.12 Clinic Card Available

Ikhadi laseklinikhi losana lwakho ndingalifumana ukuze ndilijongisise?

Expects a single option response (required)

- Ewe [1]
- Hayi [2]

Branches
- If response Equals 'Hayi' [2] then skip to Feeding prompt (5.1)

4.13 Apgar Score (1min)

Apgar score (1 umzuzu):

Expects a numeric response (optional)
4.14 **Apgar score (5 min)**

**Apgar score (mi-5 imizuzu):**

Expect a numeric response (optional)

4.15 **Birth Weight**

**Ubunzima ngexa luza-lwa usana ngokweekilogreem:**

Expect a decimal response (optional)

**Constraints**

- Response must be **Greater Than or Equal '0'**
- Response must be **Less Than or Equal '10'**

4.16 **Birth Length**

**Behulude kangakanani usana, (ukuqalela entloko kuyiwe ezinzwaneni)? (ngokweesentimitha):**

Expect a decimal response (optional)

**Constraints**

- Response must be **Greater Than or Equal '0'**
- Response must be **Less Than or Equal '100'**

4.17 **Baby Birth Head Circumference**

**Bhala ubungakanani besazinge sentloko yosana ngokweesentimitha:**

Expect a decimal response (optional)

**Constraints**

- Response must be **Greater Than or Equal '0'**
- Response must be **Less Than or Equal '100'**

---

**Section 5. Feeding**

5.1 **Feeding prompt**

Enkosi. Ngoku ndinemibuso embalwa ngendlela olondla ngayo usana lwakho.

5.2 **Breast Milk Ever**

**Wakha waluniya usana lwakho amasi ebele?**

Expect a single option response (required)

- Ewe [1]
- Hayi [2]

**Branches**

If response Equals 'Hayi [2]' then skip to **Feeding items (5.8)**

5.3 **Breast after birth**

**Usana walsuncenisa kanye usandula ukuluzala?**

Expect a single option response (required)

- Ewe [1]
- Hayi [2]

5.4 **Fed colostrum**

**Usana lwakho walondla ngobisi lokuqala lwamabele akho?**
5.5 When baby start breast milk

Waqalisa nini ukuluncancisa usana emva kokulubeleka?

Expects a single option response (required)

- Ewe [1]
- Hayi [2]

5.6 Breast problem

Wakha wanalu usulelo, okanye ingxaki esemabeleni oko luzelwe usana lwakho?

Expects a single option response (required)

- Ewe [1]
- Hayi [2]

Branches

If response Equals 'Hayi [2]' then skip to Feeding items (5.8)

5.7 Type breast problem

Zeziphi iingxaki obunazo?

Expects multiple selected options (required)

- Amabele abhonxile ligazi [1]
- Iingono ezicandekileyo [2]
- Iingono ezibuhlunlu [3]
- Iingono ezophayo [4]
- Amabele abhonxileyo, anezigoqa, abuhlunlu [5]
- Iingono ezibomvu, ezibuhlunlu ngenxa yeceesina [6]
- Okanye [95]

5.8 Feeding items

Usana lwakho wakha walunika nayiphi na kwezi zinto zilandelayo?

Expects multiple selected options (required)

- amanzi [1]
- amanzi aneswekile okanye i-glucose [2]
- incindi yeziqhamo [3]
- amayeza anokombiwa phantsi [4]
- iti engenalo ubisi [5]
- iti enobisi [6]
- inembe yerayisi [7]
- ubisi lwenkomo olungxengiweyo [8]
- ubisi lwenkomo olungaxengwanga [9]
- i-formula yeentsana [10]
- olunye ubisi lwentsana olungumgubo [11]
- ubisi lwebhokwe [12]
- isiiriylali, indengana okanye isonka [13]
- iziqhamo / imifuno [14]
- inyama [15]
- intlanzi [16]
- amaqanda [17]
5.9 Other responsible feeding choice

*Ebekhona umnto ongomye ebenoxanduva lokwenza izigibho ngendlela yokondliwa kosana twakho?*

*Expects a single option response (required)*

- Ewe [1]
- Hayi [2]

**Branches**

*If response Equals ‘Hayi [2]’ then skip to Child Care Prompt (6.1)*

5.10 Person responsible

*Ngubani obejongene naloo msebenzi?*

*Expects a single option response (required)*

- liqabane / ngumyeni [1]
- nguMamazala [2]
- nguMama [3]
- nguMongikazi [4]
- ngomnye [5]

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Section 6. Child Care

6.1 Child Care Prompt

*Ngoku ndinemibuzo embalwa ngemibandela yokunonophelwa kosana nokunye okujongene nawe njengomama.*

6.2 Child registration

*Ukubhalisile ukuzalwa kosana?*

*Expects a single option response (required)*

- Ewe [1]
- Hayi [2]
- Andazi [99]
- Ndiyala ukuphendula. [91]

**Branches**

*If response Not Equal ‘Ewe [1]’ then skip to Help when unavailable (6.4)*

6.3 Birth Certificate

*Usana twakho lunesatifikethi sokuzalwa?*

*Expects a single option response (required)*

- Ewe [1]
- Hayi [2]
- Andazi [99]
- Ndiyala ukuphendula. [91]
Section 7. Father of the child

7.1 Father of Child Prompt

Ndimonnye umbuzo ngiyise wosana lwakho.

7.2 Father acknowledged baby

Uyise wosana ulwazisile ebantwini bakwabo?

Expect s a single option response (required)

- Ewe [1]
- Hayi [2]
- Andazi [99]
- Ndiyala ukuphendula. [91]

Section 8. Mental Health (EPDS)

8.1 Thoughts and Feelings Prompt

Ngoku ndinemibuzo malunga novakalelo lwakho kwiveki ephelileyo. Nceda unike impendulo esondeleyo kwindlela ovakalelewe ngayo KWINTSUKU EZISI-7 EZIQITHILEYO, hayi indlela ovakalelewa ngayo namhlane.

8.2 Laugh

Ndikwazile ukuhleka nokubona izinto ezingaqhelekanga ezihleksayo.

Expect s a single option response (required)

- Kangangoko bendisoloko ndinakho [0]
- Hayi kangako ngoku [1]
- Ngokuqinisekileyo akukho kangako ngoku [2]
- Akunjalo [2]

8.3 Enjoyment

Bendijonge phambili ndinovuyo.

Expect s a single option response (required)

- Kangangoko bendinokwenza [0]
- Kungangaphantsi kunoko bendisenza [1]
- Ngokuqinisekileyo kunangaphantsi kunoko bendisenza [2]
- Ndaphantsi andakwenza oko [3]

8.4 Self Blame

Xa izinto bezihamba gwenxa ndifane ndazigeka kunekho mfuneko.

Expect s a single option response (required)

- Ewe, izesha eliniz [3]
- Ewe, ngelinye izesha [2]
- Bekungenzeki qho [1]
- Hayi, zange kwenzeke [0]
8.5 Anxious/worry

Bendixhalabile kunegkho mfuneko yaloo nto.

*Expects a single option response (required)*

- Hayi, akunjalo [0]
- Kwaphantse akwenzeka oko [1]
- Ewe, ngamanye amaxesha [2]
- Ewe, bekusenzeka qho [3]

8.6 Panicky

Bendiziva ndisoyika okanye ndiphaphazela kunegkho sizathu.

*Expects a single option response (required)*

- Ewe, bekusenzeka rhoqo [3]
- Ewe, ngamanye amaxesha [2]
- Hayi kangako noko [1]
- Hayi, zange kwenzeke [0]

8.7 Things piled up

Imeko ibindongamele.

*Expects a single option response (required)*

- Ewe, ixesha elininzi bendingakwazi kumelena nalo o nko [3]
- Ewe, ngamanye amaxesha bendingakwazi kumelana noko njengesiqhelu [2]
- Hayi, ixesha elininzi ndikwazile ukumelana nalo o nko [1]
- Hayi, ndikwazile ukumelana nalo o nko njengoko bekusoloko kunjalo [0]

8.8 Difficulty sleeping

Bendingonwabanga khangokuba bekunzima ukuba ndilale.

*Expects a single option response (required)*

- Ewe, ixesha elininzi [3]
- Ewe, ngamanye amaxesha [2]
- Bekungenziki qho [1]
- Hayi, akunjalo [0]

8.9 Sad/miserable

Ndizive ndilusizizi okanye ndixakanisekile.

*Expects a single option response (required)*

- Ewe, ixesha elininzi [3]
- Ewe, ngamanye amaxesha [2]
- Akusoloko kusenzeka rhoqo [1]
- Hayi, akunjalo tu [0]

8.10 Crying

Bendingonwabanga ndada ndalilila.

*Expects a single option response (required)*

- Ewe, ixesha elininzi [3]
- Ewe, bekusoloko kunjalo [2]
- Kuphela ngamaxesha athile [1]
- Hayi, zange kwenzeke [0]

8.11 Self harm

Ndikhe ndanengcina yokuzenzakalisa.

*Expects a single option response (required)*

- Ewe, bekusoloko kusenzeka [3]
Section 9. Mental Health (GHQ)

9.1 GHQ Prompt

Sithanda ukwazi ukuba impilo yakho ibinyinani KWIIVEKI EZIMBALWA EZIQITHILEYO. Nceda uyiphendula ngokulula YONKE imibuzo ngokuxela ukuba yeypipi impendulo esondele kakhulu kwimeko yakho KWIIVEKI EZIMBALWA EZIQITHILEYO. Khumbula ukuba sinqwenela ukwazi ngemeko YANGOKU neyexesho ELISANDULA UKUDLULA (ukhawuleziso lomphathi woldlwandlebe: kwiiveki ezimbalwa eziqithileyo ukususela enyangeni nemihla obufujna ngayo ingxoxo) ngezikhalazo, hayi ezo ubunazo kwixa eladlulayo. Kubalulekile ukuba yonke imibuzo mawuyiphendule.

9.2 GHQ Concentrate

Ingaba ubukhe wakwazi ukumina ingqalelo koko ukwenzayo?

Expect a single option response (required)

- Kubhetele kunesiqhelo [3]
- Kunje ngesiqhelo [2]
- Kungaphantsi kwendlela eqehekileyo [1]
- Kungaphantsi kakhulu kunesiqhelo [0]

9.3 GHQ Lost sleep

Kutshanje ubukhe womehlwa bubuthongo ngenxa yokukhathazeka?

Expect a single option response (required)

- Kubhetele kunesiqhelo [3]
- Akungaphezuwlwanga kwesiqhelo [2]
- Kungaphaya kwesiqhelo [1]
- Kungaphantsi kakhulu kunesiqhelo [0]

9.4 GHQ Useful part

Kutshanje uyithathile inxaxheba, waza waluncedo ezintweni?

Expect a single option response (required)

- Kungaphezuulwanga kunesiqhelo [3]
- Kuyafana nesiqhelo [2]
- Uncedo lungaphantsi kolwesiqhelo [1]
- Luncinci kakhulu uncedo [0]

9.5 GHQ Decisions

Kutshanje uzive unakho ukwenza iziqibo ngezinto?

Expect a single option response (required)

- Bendithe chatha kunesiqhelo [3]
- Bekufana nesiqhelo [2]
- Bekuganeno kwesiqhelo [1]
- Bekungafani tu, kungaphantsi kwesiqhelo [0]

9.6 GHQ Under strain

Kutshanje uzive usoloko uphantsi koxinzelelo?

Expect a single option response (required)

- Bekungenjalo tu kwaphela [3]
- Akungaphezuwlwanga kwesiqhelo [2]
- Kungaphezuwlwanga kunesiqhelo [1]
- Bekuthe chatha kunesiqhelo [0]
9.7 GHQ Unable overcome difficulties

Kutshanje uziwe ungenakuzyiswa iiingxaki zakho?
Expecta single option response (required)
- Bekungenjalo tu kwaphela [3]
- Akusangaphezulwanga kwesiqhelo [2]
- Kungaphezu kunesiqhelo [1]
- Bekuthe charha kunesiqhelo [0]

9.8 GHQ Enjoy activities

Kutshanje ukwazile na ukonwaba emisebenzini yakho yemihla ngemihla?
Expecta single option response (required)
- Imisebenzi indonwabise ngaphezu kwesiqhelo [3]
- Ukonwaba kuyafana nesiqhelo [2]
- Kungaphantsi kunesiqhelo [1]
- Andisonwabanga njengeko bendijnjalo [0]

9.9 GHQ Face problems

Kutshanje ukwazile na ukuhlangabezana neengxaki zakho?
Expecta single option response (required)
- Ngaphezu kunesiqhelo [3]
- Njegesiqhelo [2]
- Akufani nesiqhelo [1]
- Andisamelani kakhule neengxaki [0]

9.10 GHQ Unhappy/depressed

Kutshanje ubuziva ungonwabanga, uxhalabile?
Expecta single option response (required)
- Akusenjalo [3]
- Akusenjalo tu kwaphela [2]
- Andonwabanga njengoko bendijnjalo [1]
- Ndinxunguphele, akusenje ngakuphela [0]

9.11 GHQ Loosing confidence

Kutshanje ubukhe waphelse wakukuzithemba?
Expecta single option response (required)
- Akusenjalo [3]
- Akukho ukungazithembi okungaphezu kwesiqhelo [2]
- Andizithembanga ngakumbi [1]
- Andizithembanga tu kwaphela [0]

9.12 GHQ Worthless person

Kutshanje ubuzithatha njengongantweni?
Expecta single option response (required)
- Andizithathi njengongantweni [3]
- Andingongantweni ngokungaphezu kwesiqhelo [2]
- Ndisuke ndangungantweni kakhulu [1]
- Ndingungantweni ngokubalaseleyo [0]

9.13 GHQ Reasonably happy

Kutshanje ubuziva wonwabile, xa uqwalasele imeko?
Expecta single option response (required)
- Ndonwabe ngokungaphezu [3]
- Ndonwabe ngendlela eqhelekileyo [2]
Section 10. Enjoyable activities

10.1 Past month enjoyable activities

Kwinyanga eginghileyo, ubusoloko uzonwabisa okanye uphumla amaxesha amangaphi ngezinto ezifana nokubukela umabonwakude, ngokuya ecaweni okanye ngokuya kulungisa iimwele zakho?

- Expects a single option response (required)
  - Zange ndzionwabise [1]
  - Kange okanye kabini ngeveki [2]
  - Amaxesha maninzi evekini [3]
  - Yonke imihla [4]

10.2 Favourite Colour

Ngwuphi owona mbala uwuthandayo?
- Expects a single line text response (required)

Section 11. General health

11.1 Self regarded health - mother

Impilo yakhoo uyithatha njani ngokwemeko eginghileyo?
- Expects a single option response (required)
  - Intle kakhulu [1]
  - Intle [2]
  - Iyancomeka [3]
  - Ayiphucukanga, ayanelisi [4]

11.2 Standard Diabetes - mother

Wakha waxilongwa waza wafunyaniswa unosifiso seSwekile phambi kokuba ukhuluwwe?
- Expects a single option response (required)
  - Ewe [1]
  - Hayi [2]
  - Ndiyala ukuphendula. [91]

Branches
- If response Not Equal 'Ewe [1]' then skip to Gestational diabetes - mother (11.5)

11.3 Standard Diabetes medication - mother

Uyalufumana unyangwosimo wesiSwekile?
- Expects a single option response (required)
  - Ewe [1]
  - Hayi [2]
  - Ndiyala ukuphendula. [91]

Branches
- If response Equals 'Hayi [2]' then skip to Gestational diabetes - mother (11.5)

11.4 Standard Diabetes TYPE medication - mother

Uyangwane ngempilisi okanye ngesitofu kwisiso onaso seSwekile?
- Expects a single option response (required)
  - Iipili [1]
11.5 Gestational diabetes - mother
Ngexesha ubusakhulelwwe waxilongwa kwafunyaniswa ukuba unesifo seSwekile?

Expect a single option response (required)

- Ewe [1]
- Hayi [2]
- Ndiyala ukuphendula. [91]

Branches
If response Not Equal 'Ewe [1]' then skip to Standard hypertension - mother (11.7)

11.6 Gestational Diabetes medication - mother

Ngexesha ubusakhulelwwe wayifumana incindi yedlala elithile elilawula iswekile egazini.

Expect a single option response (required)

- Ewe [1]
- Hayi [2]
- Ndiyala ukuphendula. [91]

11.7 Standard hypertension - mother

Wakha waxilongwa wafunyaniswa unenxalababo yokunyukelwa ligazi phambi kokuba ukhulelwe?

Expect a single option response (required)

- Ewe [1]
- Hayi [2]
- Ndiyala ukuphendula. [91]

11.8 Gestational hypertension – mother

Wakha waxilongwa wafunyaniswa unesifo sokunyukelwe ligazi usakhulelwwe?

Expect a single option response (required)

- Ewe [1]
- Hayi [2]
- Ndiyala ukuphendula. [91]

11.9 Hypertension medication - mother

Ngeli ixesha uyalufumana unyangw ovesifo sokunyukelwe ligazi?

Expect a single option response (required)

- Ewe [1]
- Hayi [2]
- Ndiyala ukuphendula. [91]

11.10 Other medication

Ngoku lakhona unyangw oolufulumayo lwaso nasiphi na isifo?

Expect a single option response (required)

- Ewe [1]
- Hayi [2]
- Ndiyala ukuphendula. [91]

11.11 Post birth conditions - mother

Oko lwazalayo usana lwakho , ukhe wanayo na enye kwezi zinto zilandelayo?

Expect multiple selected options (required)

- Ukopha kakhu lu gaphantsi,(ebu mbini /ebufazini) [1]
- Iyamba elibi eli velu ngaphantsi, (ebu mbini/ebufazini) [2]
- Ukuba nefiva/nesina [3]
- Ukukhohlele okungungqqa kubuye lela [4]
- Usulelo emabeleni [5]
11.12 Traditional medicine - mother

**Nceda usixekele ukuba yeyiphile kwezi zilandelayo, ukuba iko, okhe wayisebenzisa oko kwakusishandlo sokugqibela sokuqikelelw na kwakho.**

Expects multiple selected options (required)
- **Umuzekelo** [1]
- **Ihlangalungu** [2]
- **Izimi** [3]
- **Izimo newe** [4]
- **Izimo newe kungaphantsi kwesihlandlo esinye enyangeni** [5]
- **Izimo newe kungaphantsi kwesiqhelo** [6]
- **Izimo newe kwakhe amaxesha ama amabhuleni** [7]

11.13 Infant health perception

**Usana lwakho latya kakahle?**

Expects a single option response (required)
- **Ewe** [1]
- **Hayi** [2]
- **Ndiyala ukuphendula.** [91]

11.14 Infant illness

**Belukhe lwagula usana lwakho oko lwazalwayo?**

Expects a single option response (required)
- **Ewe** [1]
- **Hayi** [2]
- **Ndiyala ukuphendula.** [91]

**Branches**

*If response Not Equal 'Ewe' [1] then skip to Crying lots (11.17)*

11.15 Type infant illness

**Usana lwakho beluguliswa yintoni?**

Expects multiple selected options (required)
- **Usana beluhube** [1]
- **Beluhupha** [2]
- **Belunyukelwe bubushushu** [3]
- **Belunyukelwe kungaphantsi kwesihlandlo esinye enyangeni** [4]
- **Belunyukelwe kwakhe amaxesha ama amabhuleni** [5]
- **Belunyukelwe kungaphantsi kwesiqhelo** [6]
- **Belunyukelwe kwakhe amaxesha ama amabhuleni kwakhe amabhuleni engalawulekiyo** [7]
- **Belakoholela** [8]
- **Belunyesi efishangela ukuba amehlo nesikhamba mawabe mthabi / belunyekwindisi** [9]
- **Belunyesi** [10]
- **Belunyesi ingulo** [95]

11.16 Seek health care – infant

**Usana lwakho ubukhe walsuwa eklinikhi okanye kugqirha ngenxa yale ngxaki okanye ngenxa yezinye iingxaki zempilo?**

Expects a single option response (required)
- **Ewe** [1]
- **Hayi** [2]

11.17 Crying lots
Section 12. TB

12.1 Participant TB

Okosigqibele ukubonana, ubukhe waxilongwa wafunyaniswa unesifo sePhepha?

Expects a single option response (required)

- Ewe [1]
- Hayi [2]
- Ndiyala ukuphendula. [91]

Branches

If response Not Equal 'Ewe [1]' then skip to Participant HH TB (12.3)

12.2 Participant TB Treatment

Lukhona unyang oolphumanyayo ngoku?

Expects a single option response (required)

- Ewe [1]
- Hayi [2]
- Ndiyala ukuphendula. [91]

12.3 Participant HH TB

Okosigqibele ukubonana, uhlonipa umntu ONGOMNYE (esingekathethi ngaye) kwabakwenu oxiloingiyo wafunyaniswa enesifo sePhepha?

Expects a single option response (required)

- Ewe [1]
- Hayi [2]
- Andazi [99]
- Ndiyala ukuphendula. [91]

Branches

If response Not Equal 'Ewe [1]' then skip to Tobacco use (13.1)

12.4 Participant HH TB Treatment

Lukhona unyang olesifo sePhepha abalufumanayo ngoku?

Expects a single option response (required)

- Ewe [1]
- Hayi [2]
- Andazi [99]
- Ndiyala ukuphendula. [91]

Section 13. Substances

13.1 Tobacco use

Ngokuya ubukhulewa ubukhe wallishaya icuba?

Expects a single option response (required)

- Ewe [1]
- Hayi [2]
- Ndiyala ukuphendula. [91]

Branches

If response Not Equal 'Ewe [1]' then skip to Tik (13.3)
13.2 Tobacco frequency

Kwiinyanga ezi-3 eziggithileyo, ubutshaya ngoentsuku ezingaphi?

Expects a numeric response (required)

13.3 Tik

Ngokuya ubukhulelwwe ubukhe wayisebenzisa i-tik?

Expects a single option response (required)

- Ewe [1]
- Hayi [2]
- Ndiyala ukuphendula. [91]

Branches

If response Not Equal 'Ewe [1]" then skip to Dagga (13.5)

13.4 Tik frequency

Kwiinyanga ezi-3 eziggithileyo, i-tik uyisebenzise iintsuku ezingaphi?

Expects a numeric response (required)

13.5 Dagga

Ngokuya ubukhulelwwe ubuyisebenzisa intsanga?

Expects a single option response (required)

- Ewe [1]
- Hayi [2]
- Ndiyala ukuphendula. [91]

Branches

If response Not Equal 'Ewe [1]" then skip to Alcohol Prompt (14.1)

13.6 Dagga frequency

Kwiinyanga ezi-3 eziggithileyo, intsangu uyisebenzise iintsuku ezingaphi?

Expects a numeric response (required)

Section 14. Alcohol

14.1 Alcohol Prompt


14.2 Participant Alcohol Drinking Frequency - Pre-birth Month

Phakathi kwinyanga ephethileyo, phambi kokuba luwalwe usana lwakho, kumalunga namaxesha amangaphi usela NALUPHI NA udidi lotywala? (Umphathi wodiwisanondlebe: Sebenzisa iglasi/ikomityi epheleksileyo ubuzise.

Expects a single option response (required)

- Zange ndisele [0]
- Kungaphantsi kwenishlando esinye enyangeni [1]
- Kanye ngenyanga [2]
- Izhlandlo ezi-2 ukuya kwezi-3 ngenyanga [3]
- Kanye ngeveki [4]
- Amaxesha ama-2 ngeveki [5]
- Amaxesha ama-3 ukuya kwama-4 times a week [6]
- Phantse yonke imihla [7]
14.3 Participant Alcohol Drinking Volume - Pre-birth Month

Phakathi kwinyanga ephelileyo, phambi kokuba luzalwe usana lwakho, xa udibanisa zonke iiindidi zotywa zidityanisiwe, zingaphi iiiglasi ODLA ngokuzisela ngentsuku zokusela kwakho utywala?
Expect a single option response (required)
- Ikhesha eli-1 okanye ama-2 [0]
- Amaxesha ama-3 okanye ama-4 [1]
- Amaxesha ama-5 okanye ama-6 [2]
- Amaxesha asi-7, asi-8 okanye asi-9 [3]
- Amaxesha ali-10 okanye ngaphezu koko [4]

14.4 Participant Alcohol 4+ Drinks Frequency - Pre-birth Month

Phakathi kwinyanga ephelileyo, phambi kokuba luzalwe usana lwakho, kumalunga nakangaphi usoloko usela iiiglasi EZINE okanye EZINGAPHEZU KOKO ngosuku?
Expect a single option response (required)
- Zange ndisele [0]
- Kungaphansi kweshilandlo esinye enyangeni [1]
- Kanye ngenyanga [2]
- Izhilandlo ezi-2 ukuya kwezi-3 ngenyanga [3]
- Kanye ngeveki [4]
- Amaxesha ama-2 ngeveki [5]
- Amaxesha ama-3 ukuya kwama-4 ngeveki [6]
- Phantse yonke imihla [7]
- Yonke imihla [8]

14.5 Participant Alcohol 3+ Drinks Frequency - Pre-birth Month

Phakathi kwinyanga ephelileyo, phambi kokuba luzalwe usana lwakho, kumalunga nakangaphi usoloko usela iiiglasi EZINTA THU okanye EZINGAPHEZU KOKO ngosuku?
Expect a single option response (required)
- Zange ndisele [0]
- Kungaphansi kweshilandlo esinye enyangeni [1]
- Kanye ngenyanga [2]
- Izhilandlo ezi-2 ukuya kwezi-3 ngenyanga [3]
- Kanye ngeveki [4]
- Amaxesha ama-2 ngeveki [5]
- Amaxesha ama-3 ukuya kwama-4 ngeveki [6]
- Phantse yonke imihla [7]
- Yonke imihla [8]

14.6 Participant Alcohol Drinking Frequency - Post Birth

Njengoko seluzelwe usana lwakho, kumalunga nakangaphi usoloko ubusela NABUPHI NA utywala?
Expect a single option response (required)
- Zange ndisele [0]
- Kungaphansi kweshilandlo esinye enyangeni [1]
- Kanye ngenyanga [2]
- Izhilandlo ezi-2 ukuya kwezi-3 ngenyanga [3]
- Kanye ngeveki [4]
- Amaxesha ama-2 ngeveki [5]
- Amaxesha ama-3 ukuya kwama-4 ngeveki [6]
- Phantse yonke imihla [7]
- Yonke imihla [8]
14.7 Participant Alcohol Any Drink Number - Post Birth

Njengoko seluzelwe usana lwakho, xa kubalwa zonke iindidi zotywala budibanyanise, zingaphi iiqglsi ODLA ngokuzisela ngeentsoku zokusela kwakho utywala?

*Expect a single option response (required)*

- Ixesha eli-1 okanye ama-2 [0]
- Amaxesha ama-3 okanye ama-4 [1]
- Amaxesha ama-5 okanye ama-6 [2]
- Amaxesha ama-7, ama-8 okanye ama-9 [3]
- Amaxesha ali-10 okanye angaphesu koko [4]

14.8 Participant Alcohol 4+ Drinks Frequency - Post Birth

Njengoko seluzelwe usana lwakho, kumalunga nakangaphi usela iiqglsi EZINE okanye EZINGAPHEZU KOKO ngosuka?

*Expect a single option response (required)*

- Zange ndisele [0]
- Kungaphantsi kwezihlando esinye enyangeni [1]
- Kanye ngenyangana [2]
- Izihlandlo zi-2 ukuya kwezi-3 ngenyangana [3]
- Kanye ngeveki [4]
- Amaxesha ama-2 ngeveki [5]
- Amaxesha ama-3 ukuya kwama-4 ngeveki [6]
- Phantse yonke imihla [7]
- Yonke imihla [8]

14.9 Participant Alcohol 3+ Drinks Frequency - Post Birth

Njengoko seluzelwe usana lwakho, kumalunga nakangaphi usela iiqglsi EZINTATHU okanye EZINGAPHEZU KOKO ngosuka?

*Expect a single option response (required)*

- Zange ndisele [0]
- Kungaphantsi kwezihlando esinye enyangeni [1]
- Kanye ngenyangana [2]
- Amaxesha ma-2 ukuya kwama-3 ngenyangana [3]
- Kanye ngeveki [4]
- Amaxesha ama-2 ngeveki [5]
- Amaxesha ama-3 ukuya kwama-4 ngeveki [6]
- Phantse yonke imihla [7]
- Yonke imihla [8]

14.10 Participant Number Drinks High

Zingaphi iiqglsi ezifunekayo ukuze uzive usemqheleni?

*Expect a numeric response (required)*

14.11 Participant External Alcohol Concern

Bebekhe bakukhulazela na abahlolo okanye izalamane ezisondele kuwe ngokusela kwakho utywala?

*Expect a single option response (required)*

- Ewe [1]
- Hayi [2]

14.12 Participant Drink Morning

Ngamanye amaxesha akusasa ukhe uthathe ithamo xa uqalayo ukuvuka?

*Expect a single option response (required)*
14.13 Participant Alcohol Memory Loss

Umhlolo okanye umuntu wakowenu wakhu wakuxelela na ngezinto ozithethileyo okanye ozenzileyo ongasenakho ukuzikhumbula?

Expects a single option response (required)
- Ewe [1]
- Hayi [2]

14.14 Participant Alcohol Cut Down

Ngamanye amaxesha ukhe uzive unqwenela ukuthoba isantya ekuseleni?

Expects a single option response (required)
- Ewe [1]
- Hayi [2]

Section 15. Sexual Partner

15.1 Sexual Partner Prompt

Kule miyuzo ilandelayo ndiza kukubuza ngomuntu wokugqibela owawudibene naye ngesondo.

15.2 Sexual Partner Been for HIV Test

Unolwazi na ngokuba iqabane lakho odihana nalo ngesondo bekhe laya kuxilongwa na kukhangelwa ukuba linayo i-HIV?

Expects a single option response (required)
- Ewe [1]
- Hayi [2]
- Andazi [99]
- Ndiyala ukuphendula. [91]

Branches
If response Not Equal 'Ewe [1]' then skip to Asked Sexual Partner to Test (15.4)

15.3 Sexual Partner HIV Status

Ithini imeko yakhe nge-HIV?

Expects a single option response (required)
- Unayo i-HIV [1]
- Akanyo i-HIV [2]
- Andazi [99]
- Ndiyala ukuphendula. [91]

15.4 Asked Sexual Partner to Test

Ukhe walicela eli qabane ukuba liyokuxilongwa kukhangelwe ukuba linayo na i-HIV?

Expects a single option response (required)
- Ewe [1]
- Hayi [2]
- Ndiyala ukuphendula. [91]

15.5 Could Ask Sexual Partner to Test

Ungalicela ukuba liyokuxilongwa kukhangelwe i-HIV?

Expects a single option response (required)
- Ewe [1]
- Hayi [2]
- Ndiyala ukuphendula. [91]
15.6 Sexual Partner Involved Other Women

Ucinga ukuba iqabane lapho lesondo linamanye amabhinqa elithandana nazo?
Expects a single option response (required)
- Ewe [1]
- Hayi [2]
- Ndiyala ukuphendula. [91]

15.7 Sexual Partner Has TB

Iqabane odihana nalo ngesondo linesifo sePhepha
Expects a single option response (required)
- Ewe [1]
- Hayi [2]
- Andazi [99]
- Ndiyala ukuphendula. [91]

Branches
If response Not Equal 'Ewe [1]' then skip to Clinic sessions (16.1)

15.8 Sexual Partner Receiving TB Treatment

Liyalufumana unyanglo lweniso sePhepha?
Expects a single option response (required)
- Ewe [1]
- Hayi [2]
- Andazi [99]
- Ndiyala ukuphendula. [91]

Section 16. Antenatal Clinic Visits & HIV Testing

16.1 Clinic sessions

Phambi kokuba ubeleke ubutshele kwilikhini ezingaphi apho uhlonene khona nonompilo?
Expects a numeric response (required)

16.2 Tested HIV in Antenatal Care

Njengokuba ukhululwwe ubukhe waya kuxilongwa eklinikhi kuxhangelwa i-HIV phambi kokubaleka?
Expects a single option response (required)
- Ewe [1]
- Hayi [2]
- Andiqinisekanga [99]
- Ndiyala ukuphendula. [91]

16.3 HIV Positive

Ingabo unayo intsholongwane i-HIV (ngokuqinisekileyo yaye / okanye imeko seyitshintshile oko kwasekuqeleni)?
Expects a single option response (required)
- Ewe [1]
- Hayi [2]
- Andiqinisekanga [99]
- Ndiyala ukuphendula. [91]

Branches
If response Not Equal 'Ewe [1]' then skip to Voucher given (18.1)
Section 17. HIV Medication

17.1 Disclosed at Hospital
Ubukhe wamxelela nawuphi na koonompilo besibhdelele ukuba une-HIV?

Expects a single option response (required)
- Ewe [1]
- Hayi [2]
- Andiqinisekanga [99]
- Ndiyala ukuphendula. [91]

17.2 AZT Usage Prior to Labour
Nceda undixelele ngxesha owaqalayo, owayekayo, nokuba ngosoku i-AZT uyithatha amaxesha amangaphi phambikokakubeko: (INQAKU KUMPATHI WODLILWANONDBLEBE: Abathathinaxhheba baqalisa nga-AZT nangaliphi na ishesa ukuqa lela kwiliveki ezingama-28. Umthathi-nxaxhheba wathatha ipilibi yanye kabini ngemini ngelo xesha lonke kungekho ntsuku azisibayo. ISIKORA NJENGOKO SIPHELELE. Xa umthathi-nxaxhheba eheyekile ukuzisebenzisa ipilibi phambikokukubeko abeleke ngexa yaso nasiphi na isizathu, ISIKORA SAKUBA ASIPHELELANGE. Xa ebeneentsuku azisibileyo phakathi kweveeki ezingama-28 nokubelela kwakhe okanye ayekele aze aluqalice unyangango, ISIKORA SIPHAZAMISEKILE.)

Expects a single option response (required)
- Ngokuphelelelo. [1]
- Ixesha elingaphelela [2]
- Bekukho ukuphazamiseka [3]
- Ndiyala ukuphendula. [91]

17.3 Medication to Prevent HIV Transmission
Amanyeza akho uwasebenzisile okuthintela ukunwenwa kwe-HIV ngxesha lokubeleka?

Expects a single option response (required)
- Ewe [1]
- Hayi [2]
- Andiqinisekanga [99]
- Ndiyala ukuphendula. [91]

Branches
If response Not Equal 'Ewe [1]' then skip to NVP Tablet at Onset of Labour (17.5)

17.4 AZT Usage During Labour
Nceda undixelele ngxesha owaqalayo, owayekayo, nokuba bekuxesha liphile lhekhefu ubuthathe ii-AZT xa ubusiya kubelela: (INQAKU KUMPATHI WODLILWANONDBLEBE: Qulisina nga-AZT qho emva kweeyvere ezi-3 kanye ngelixhesa ukuzakala - ISIKORA NJENGOKO SIPHELELE. Xa engaluthathanga unyangango ngaphantsi kwavee ezi-2 zelo xesha lamathamo athathwa qho emva kweeyvere ezi-3, kodwa amathamo ebesoloko ephwoze, ISIKORA NGOKU SIPHAZAMISEKILE.)

Expects a single option response (required)
- Ngokuphelelelo. [1]
- Ixesha elingaphelela [2]
- Bekukho ukuphazamiseka [3]
- Ndiyala ukuphendula. [91]

17.5 NVP Tablet at Onset of Labour
Ubukhe wasela ipilibi enye eyi-NVP xa ubuqalisa ukulunywa?

Expects a single option response (required)
- Ngokuphelelelo. [1]
- Ixesha elingaphelela [2]
- Ndiyala ukuphendula. [91]

17.6 NVP Syrup Within 24h
Usana lwakho lusezewo ithamo le-NVP eyinyobhoba-nyobhoba ngxesha leeyvere ezingama-24 ekuzalweni kwaloi? (INQAKU KUMPATHI WODLILWANONDBLEBE: Usana lumufeme ithamo le-NVP ngxesha leeyvere ezingama-24 kanye emva kokubukuxesha, ISIKORA SIPHELELE. Usana alufumenganga thamo emva kokubukuxesha, ISIKORA ASIPHELELANGE. Usana lumufene ithamo le-NVP ixesha elingaphelelu kwweeyvere ezingama-24 emva kokubukuxesha, ISIKORA SINJENGOKO BESIBAMBELEKILE.)

Expects a single option response (required)
17.7 AZT Dispensed

Ubuyinkwe i-AZT kusenzelwa usama lwakho?

*Requires a single option response*

- Ewe [1]
- Hayi [2]
- Ndiyala ukuphendula. [91]

**Branches**

*If response Not Equal "Ewe [1]" then skip to Disclosure and Protection Prompt (18.1)*

17.8 AZT Course Length

Bebungakanani ubude bexesha obulunikwe?

*Requires a single option response*

- Zi iintsuku [1]
- Zingama e28 iintsuku [2]
- Elinye ixesha [95]
- Andazi [99]

17.9 Medicating as Prescribed

Usana lwakho ubulunika amayeza ngendlela obuxelelwhe ngayo?

*Requires a single option response*

- Ewe [1]
- Hayi [2]
- Ndiyala ukuphendula. [91]

Section 18. Disclosure and Protection

18.1 Disclosure and Protection Prompt

Enkosi. Eli licandelo lokugqibela lolu dliwanondlebe. Ndinemibuzo enje embalwa ngoku malunga nenkcazel o endinokuyiphumana nge-HIV.

18.2 Able to disclose

Xa ubufuna ukunikazelo ngemeko yakho emalunga ne-HIV, ubunokuwazi ukuvenza loo nto?

*Requires a single option response*

- Ewe [1]
- Hayi [2]
- Andiqinisekanga [99]
- Ndiyala ukuphendula. [95]

18.3 Disclosed to Partner

Iqabane lakho ulixelele ngemeko yakho emalunga ne-HIV?

*Requires a single option response*

- Ewe [1]
- Hayi [2]
- Andinalo iqabane [3]
- Ndiyala ukuphendula. [91]

18.4 Number family disclosed
18.5 **Number people outside family disclosed to**

Bangaphi abantu abangengabo abakowenu ubaxeleleyo ngemeko yakho ye-HIV?

Expect a numeric response (required)

<table>
<thead>
<tr>
<th>Number people outside family disclosed to</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

18.6 **Worry church disclosure**

Ungakhatheza na xa ibandla okhonza nalo linokwazi ngemeko yakho ye-HIV?

Expect a single option response (required)

- Ewe [1]
- Hayi [2]
- Andiqinisekanga [3]
- Akwenzeki – akukho cawa [4]
- Ndiyala ukuphendula. [91]

18.7 **Participant Comfortable Disclosing Partner**

Nceda ukhethe ukuba kwezi zilandelayo, yeyiphi, (ukuba ikhona), oziza ukuhulekile ukuthetha ngayo NEQABANE lakho:

Expect multiple selected options (required)

- Ukukhulelwa [1]
- Intsholomwane i-HIV [2]
- Ukucela uncedo xa ulufuna [3]
- Ukuthetha phandle xa izinto zihamba ngobugwenxa [4]
- Ukuthetha ungafulisi ngemeko yakho yokuba ne-HIV [5]
- Akanamlingani [6]
- Akukho nanye kwezi zingentla [7]

18.8 **Participant Comfortable Disclosing Clinic Nurse**

Nceda ukhethe ukuba ngowuphi (ukuba ukhona), oziza ukuhulekile ukuba ungathetha naye: UMONGIKAZI okanye ABANTU ABASEBENZAYO EKLINIKHILE malunga:

Expect multiple selected options (required)

- Ukukhulelwa [1]
- Intsholomwane i-HIV [2]
- Ukucela uncedo xa ulufuna [3]
- Ukuthetha phandle xa izinto zihamba ngobugwenxa [4]
- Ukuthetha ungafulisi ngemeko yakho yokuba ne-HIV [5]
- Akukho nanye kwezi zingentla [6]

18.9 **Participant Comfortable Disclosing Female Relative/Friend**

Nceda ukhethe ukuba ngowuphi (ukuba ukhona), oziza ukuhulekile ukuba ungathetha naye: ngowakho UMA/ USISI/ ISIZALWANA SAKHO ESILIBHINQA/ UMHLOBOKAZI WAKHO malunga:

Expect multiple selected options (required)

- Ukukhulelwa [1]
- Intsholomwane i-HIV [2]
- Ukucela uncedo xa ulufuna [3]
- Ukuthetha phandle xa izinto zihamba ngobugwenxa [4]
- Ukuthetha ungafulisi ngemeko yakho yokuba ne-HIV [5]
- Akukho nanye kwezi zingentla [6]
Section 19. End of Survey

19.1 Voucher given

Umthathi-nxaxheba ebeypinikiwe ivawutsha yokunya eyi-Ršo?

Expects a single option response (required)

- Ewe [1]
- Hayi [2]

19.2 End

Ngoku sowulfuncile uphando. Ungabuyela apho ubukho, uhlole iindlela obukade Uphendula ngayo okanye ukhethe OKULANDELA YO ukuze uliqaqibele eli candelo.
APPENDIX F
Questions used from PMMS for this sub-study from birth questionnaire

Birth assessment (English and Xhosa)

Questions to be used for this sub-study

3.1
4.3
4.4
4.5
4.6
4.7
4.8
4.15
4.16
4.17
11.5
11.6
11.8
11.9
11.11
16.1
APPENDIX G
Informed Consent Form (English Version)

Home Visit Interventions in South African Townships: Prevention of HIV, Alcohol, & Child Malnutrition

WHAT THIS IS ABOUT
You are being invited to take part in a research project. Please take some time to read the information presented here, which will explain the details of this project. Please ask the data collector any questions about any part of this project that you do not fully understand. Your participation in this study is entirely voluntary. This means you are free to decline to participate, or to withdraw from the study at any point. This will not affect you negatively in any way whatsoever.

This study has been approved by the Committee for Human Research at Stellenbosch University. It will be run following the rules of the Declaration of Helsinki, South African Guidelines for Good Clinical Practice and the Medical Research Council (MRC) Ethical Guidelines for Research.

WHO ARE WE AND WHY ARE WE HERE?
We are from Philani Nutrition Centres and Stellenbosch University. We work with the Centre for Community Health at the University of California, Los Angeles. We will be doing a study here over the next few years. We will collect information about expecting and new mothers and their babies, from the time a mother is pregnant until her baby is 18 months old. The reason we are doing the study is because we want to develop an effective intervention program to support the health of pregnant mothers and their babies in this community.

The National Institute on Alcohol Abuse and Alcoholism in the United States is paying for the study.

Dr. Mary Jane Rotheram-Borus from the University of California, Los Angeles (UCLA) is the Principal Investigator for this study. Prof. Mark Tomlinson (Stellenbosch University), Dr. Ingrid le Roux (Philani) and Dr. Mary O’Connor (UCLA) are Co-Investigators of this study.

WHY WE WOULD LIKE YOU TO PARTICIPATE
You are being invited to be part of this research because:

• You are a pregnant mother in this neighborhood
• You are 18 years of age or older

WHAT IS INVOLVED?
If you volunteer to participate in this study, we would like you to do the following things:
Interviews

Today we would like to interview you about many different aspects of your life, including information about your family, your health, sexual behaviors, thoughts about HIV issues, your daily routines, alcohol, and drug use, as well as general knowledge about child care and infant feeding. Some questions may be personal or sensitive, but they are all entirely voluntary. Here are some sample questions you may be asked: “Do you drink alcohol?”, “How many children do you have?” and “How many sex partners have you had in the last year?” We will never ask your name during the interview. Your answers will never be linked to your name or personal details. We think that the interview will last about 90 minutes.

If you still agree to be part of our study, you will also be asked questions 3 more times, when your baby is 6 days old, 6 months old, and 18 months old. At these interviews, the questions will be similar to those I will ask you today, and your baby will also be weighed and measured.

We will go to 26 different neighborhoods in Harare, Mfuleni, Ndlovini and Makaza, where will ask other mothers like you to be involved in all our interviews as well. We will be asking approximately 1800 expecting mothers to participate in total.

Intervention

There will be two neighbourhood groups of expecting mothers in this study. In some neighborhoods the mothers in our study will continue to receive the normal medical care you can get at the government clinics. Other neighbourhoods will also receive home visits from Philani Nutrition Centres. We will flip a coin to decide which group your neighborhood is in. If your house is in one of the neighbourhoods where there are Philani home visits being offered, you will be asked to let a trained Mentor Mother visit you several times during your pregnancy, and several times after your baby is born. The Mentor Mother’s job is support you throughout your pregnancy, and she will talk with you about a range of different things, including things like your antenatal care, eating and drinking and taking the right medicines and vitamins when you are pregnant, feeding your baby, coping with or preventing HIV and TB, and taking care of your baby’s health and happiness. On some visits, the Mentor Mother will bring someone else from the research team with them. The person they bring will be trained about home-visit topics and will be part of the research team.

Whether you have the home visits or not, you may still be asked to answer questions when your baby is one week old, and six and eighteen months old.

Medical Record Review
We will look at your medical records and your baby’s Road to Health Card. We will collect information from these records. This information includes:

- TB Record
- ART Results
- CD4 Counts
- Tobacco use
- Alcohol use
- Substance use
- Infant feeding option
- STI results
- Urine results (glucose)
- Blood tests (blood group, haemoglobin, ferritin)

After your baby’s birth, we will collect this information:

- Birth weight
- Length
- Head circumference
- APGAR
- Immunizations record
- If baby is a twin
- If there was / is a TB contact in the home
- If any brothers and sisters of the baby are underweight
- If baby is bottle-fed at all
- Vitamin A supplementation
- Diagnosis and treatment of illnesses

We will never link this information to you or your baby.

**LOCATOR FORM**

We need to be able to keep in touch with you while you are in the study. To help do this, we have a form we hope you will fill out. The form asks you to tell us the names and phone numbers of people who might know how to get in touch with you. We will only call those people if we cannot find you first. We will never say that you are in this study, or tell them anything about you. The information you give us on this form will be kept separate from any other information you give us.
PARTICIPATION AND WITHDRAWAL

We would really like you to be in our study, but being in this study is entirely voluntary. You will NOT be penalized in ANY way if you decide you don’t want to participate, or you want to stop your participation at any time.

Drs. Tomlinson and le Roux will answer questions about the study if you have any.

♦ Dr. Tomlinson’s number is 021 808 3446.
♦ Dr. le Roux’s number is 021 387-5124.
♦ If you still have questions or complaints which you feel were not answered properly by the above research members, you can call the Committee for Human Research. The telephone number is 021-938 9207.
♦ Dr. Rotheram-Borus’ number is +310-794-8280. Her fax is +310-794-8297. Reverse-charges calls about the study will be accepted. Her address is:

UCLA Centre for Community Health
10920 Wilshire Blvd., Suite 350
Los Angeles, California, 90024, USA.

WHAT WILL HAPPEN TO THE INFORMATION COLLECTED?

The information we collect will help us decide how to improve the support and health of expecting and new mothers in South Africa. We hope this information will be used to improve services and support.

POTENTIAL RISKS AND DISCOMFORTS

Some of the questions we will ask may make you feel uneasy or upset. You do not need to answer any questions that you do not want to. If you become upset, we can also give you a list of people who are available to talk with you if and when you need it.

POTENTIAL BENEFITS TO SUBJECTS AND/OR TO SOCIETY

You may not personally get any benefit from this study, though getting the home visits may help you directly if you are in a neighborhood where a Mentor Mother is working.

PAYMENT FOR PARTICIPATION

You will not be paid to be in this study. You will be given a food voucher to the value of R80 if you decide to answer the questions today. You will receive a food voucher to the value of R80 if you decide to answer questions in the future.

PHOTOGRAPHS

We would like to take a picture of you before the first interview in order to help us identify you when you arrive for future interviews after your baby is born. If you agree, we will keep the photograph on a computer which is
locked so no one except research staff will be able to access it. The photograph will not be linked to any of your personal information from any of the interviews.

AUDIO TAPING
Today’s questions will be audio taped. We tape the questions to check that they are being asked correctly. Only research staff members will listen to the tapes. Your identity will not be revealed. The tapes will be locked up during the study. They will be destroyed after their use in this research project.

If you participate in future interviews, they also will be audio taped.

CONFIDENTIALITY
The information collected in this study cannot be identified with you. It is confidential.

We will only use the information you give us for research. It will be stored on computers at a central location. It will be password protected. It will be kept in locked cupboards with limited access. Only the research staff can see the information you give us. The people who are paying for this research, the study monitors, auditors or Research Executive Committee (REC) members may need to inspect all study records at some point but nobody will be able to identify you personally. The results of the study might become public, but your information will remain confidential.

If you have any questions, you are welcome to contact the Ethics Committee at Stellenbosch University Office if you have questions. The address is:

Private Bag X1
Matieland 7602
021-938-9075.
CONSENT TO PARTICIPATE

I agree to participate in this research study. It will help develop a program to support expecting and new mothers and their children.

I will answer your questions. The questions are about my background, thoughts, feelings, situation, hardships, knowledge, and health. Research staff may conduct a review of my medical records.

If Mentor Mothers are assigned to my neighborhood, I will participate in their home visits.

I understand I am participating on an entirely voluntary bases, and that I can stop my participation at any point.

All of my questions about this research study and my participation in it have been answered.

I understand that this research may not benefit me personally.

I have received the telephone number of a person to contact if I need to speak about issues which may arise in during the questions.

I understand that this consent form will not be linked to my responses. My answers will remain confidential.

.................................................................................................................................................. 

Signature of Participant                           Name of participant

.................................................................................................................................................. 

Date

SIGNATURE OF INVESTIGATOR OR DESIGNEE

In my judgment the subject is voluntarily and knowingly giving informed consent and possesses the legal capacity to give informed consent to participate in this research study.

..................................................................................................................................................

Name of Investigator or Designee
Signature of Investigator or Designee          Date
IFom yeMvumo engeNgqiqo (Consent form, Xhosa Version)

ULamlo lokuTyelela amaKhaya kwiiLokishi zoMzantsi-Afrika: UThintelo lwentsholongwane i-HIV, loTywala nokungoNdleki kwabaNtwana

OKU KUMALUNGA NANTONI?


Esi sifundo samkelwe yiKomiti yoPhando ngezoLuntu kwiDyunivesithi yaseStellenbosch. Siza kuqhutywa ngokulandela imiqathango yesiBhengezo seHelsinki, iziKhokelo zoMzantsi-Afrika zemiSebenzi emiHle yeeKlinikhi neyeQumrhu eliPhanda ngezoNyango, (MRC), nangeziKhokelo zokuziPhatha kwimicimbi yoPhando.

SINGOBANI THINA, KUTHENI LE NTO SILAPHA?


I-National Institute on Alcohol Abuse and Alcoholism, oko kukuthi, iZiko likaZwelonske elijongene nokuSetyenziswa Gwenxa koTywala, nokweNzakaliswa kweNtlalontle ngoTywala, elise-United States, lilo elisihlawulelayo esi sifundo.
UGqirha Mary Jane Rotheram-Borus weDyunivesithi yaseCalifornia, eLos Angeles (UCLA) nguye umPhandi oyiNtloko kwesi sifundo. UNjingalwazi Mark Tomlinson (weDyunivesithi yaseStellenbosch), uGqirha Ingrid le Roux (wePhilani) noGqirha Mary O’Connor (UCLA) nabo bakwangabaPhandi kwesi sifundo.

ISIZATHU SOKUFUNA KWETHU UKUBA WENA UTHATHE INXAXHEBA

Uyamenywa ukuba ube yinxalenye yolu phando ngenxa yokuba:
- Kule ngingqi ungumama okhulelwayo.
- Iminyaka yobudala bakho ili-18 okanye umdala ngaphezu koko.

KOKUPHI OKUFUNEKAYO?

Ukuba ulivolonti elithatha inxaxheba kwesi sifundo, singathanda ukuba wenze ezi zinto zilandelayo:
Udliwanondlebe


Ulamlo

Kwesi sifundo kuza kufakwa amaqela angoomama abakhulelwayo abavela kwandido ezimbini. Kwindawo enye oomama abasesifundweni sethu baza kuqhuba ngokufumana ukunonophelwa kwicala lonyango ngale ndlela bekuzwa kwenziwa ngayo nakwiklinikhi zikarhulumente. Abantu abavela kumaZiko eSondlo sakwaPhilani baza kutyelela abanye abakwezinye iyindawo kumakhaya abo. Xa sifuna ukwenza iziqqibo zokuba indawo yakho izakuba phi na, siza kuncedisa nqomile. Ukuba iqela lakho lelinye lahalo aza kutyelela kumakhaya abo yiPhilani, uza kucela ukuba wena uvumele uMama oQeqeshiweyo nokwangumcebisi ukuba makasoloko ekutyelela amaxesa amaninzi ngeli xesha usakhulelwoyo, aphinde asoloko ekutyelela xa seluzelwe usana lwakho. Umsebenzi womcebisi ngowokuba makakuxhase ngeli xesha lonke usakhulelwoyo, uza kuthetha nawe ngezinto ezizinzi ezahlukeneyo, oko
kuquka indlela akunonophelo ngayo phambi kokufumana kwakho usana, ukutyfa, ukusela, ukusebenzisa amayeza akufaneleyo kunye neevithamini ngoku usakhulelwayo, ukondliwa kosana lwakho, ukukwazi ukumelana okanye ukuyithintela intsholongwane i-HIV kunye nesiFo sePhepha, ukunonophelwa kwempilo yosana lwakho nokulonwabisa. Ngamanye amapesha otyelelo umcebisi uza kufika nomnye umntu ozakube ehamba neqela eliphandayo. Lo mntu kuziwe naye liqela uza kuqeqeshelwa imixholo emalungla nokutyelela amakhaya yaye uzakube eyinxalenye yeli qela liphandayo.

Nokuba kuyatyelelwa na kwikhaya lakho okanye akutyelelwa, usenokucelwa ukuba uphendule imibuzo xa usana lwakho seluneveki enye luzelwe, xa luludala kangezane yena eliphandayo kanye ezilishumi elinesibhozo.

**UHLolo lweRekhodi yoNyango**

Siza kujonga kwirekhodzi zonyango lwakho nakwiKhadi loSana lwakho elimalungu neNdlela ebheka eMpilweni. Siza kuqokelela iinkcukacha kwezo rekhodi. Ezi nkukacha zibandakanya:

- IRekhodi yeTB
- Iziphumo ze-ART
- lCd4 Counts
- Ukuseteyenziswa kwecuba
- Ukuseteyenziswa koTywała
- Ukuseteyenziswa kweziyobisi
- Ezinye iindlela zokondliwa kosana
- Iziphumo zokuXilongelwa izifo onokuzifumana ngomgca weSondo
- Iziphumo zomchamo (i-glucose)
- Ingxilongo yeGazi (udidi lwegazi, isibomvisigazi /ihimoglobin, ne-ferritin)

Emva kokuba luzelwe usana lwakho, siza kuziqokelela ezi nkukacha:

- Ubunzima bosana ekuzañweni kwalo
- Ubude balo
- Ubungakanani besazinge sentloko yosana
- I-APGAR
- Irekhodi yokugonywa
• Olu sana luliwele na.
• Ingaba kweli khaya wakha wakhona umntu one-TB okanye osenayo nangoku?
• Oodade okanye oobhuti bolu sana ubunzima babo bungaphantsi na kobu bolu sana?
• Ingaba usana olu luyayincanca na ibhotile?
• Usana lunaso isongezelelo esinguVitamin A?
• Ingxilongo yezifo onyango lwazo

Ezi nkukachaka soze sizidibanise nawe okanye nosana lwakho.

IFOM EZA KUSINCEDA UKUZE SIKUFUMANE

UKUTHATHA INXAXHEBA NOKURHOXA
Ngokwenene singathanda ukuba ubekhona kwesi sifundo sethu, kodwa ukubandakanyeka kwakho kusokwenza ngokuzithandelayo kwakho. Soze wohlwaywe NANGALUPHI NA UHLOBO xa uziqondayo ukuba akufuni kuthatha nxaxheba, okanye xa ufuna ukurhoxa ungabi saqhuba ngokuthatha inxaxheba.

Aba Gqirha: uTomlinson no-le Roux baza kuphendula imibuzo emalungu nesi sifundo xa uthanda ukubuzisa kubo.
♦ UGqirha Tomlinson nantsi inombolo yakhe: 021 808 3446.
♦ UGqirha le Roux nantsi inombolo yakhe: 021 387-5124.
♦ Ukuba usenayo eminye imibuzo okanye unezikhala ngemibuzo engaphendulwanga kakuhle ngala malungu angentla aphandayo, ungatsalela umnxeba wamiKomiti ePhanda ngezoLuntu. Nantsi inombolo yemfono-mfono: 021-938 9207.
♦ UGqirha Rotheram-Borus nantsi inombolo yakhe: +310-794-8280.

Nantsi eyefeksi yakhe: +310-794-8297. Xa ufuna ibengabo abahlawulela ukubafowunela kwakho, loo nto ivumelekile. Nantsi idilesi yakhe:
UCLA Centre for Community Health
10920 Wilshire Blvd., Suite 350
Los Angeles, California, 90024, USA.

**KUZA KWENZEKA NTONI NGEENKCUKACHA EZIQOKELELWEYO?**

Linkcukacha eziqokelelweyo ziza kusinceda senze izigqibo ngendlela yokuphucula inkxaso nempilo yabaqalayo ukuba ngoomama nabakhulelweyo boMzantsi-Afrika. Sinethemba lokuba ezi nkukachachiziqa kusinceda senze izigqibo ngendlela yokuphucula inkxaso.

**IMINGCIPHEKO ESENOKUVELA NOKUNGONWABI**

Eminye yemibuzo esiza kuyibiza ingakwenza ungonwabi okanye uxakaniseke. Akukho mfuneko yokuba uphendule nangomama nabakhulelweyo, xa ufhikelwa kukuXakaniseka, singakunika uluhlu lwabantu abafumanekayo nangathethayo nave, xa ufuna ngolo hlobo okanye naxesha liphi na xa ufuna.

**ABAYIPHENDULEYO IMIBUZO KUNYE NABAHLALI BAFUMANAMA NTONI APHA?**

Wena usenokungalufumani uncedo kwesi sifundo, noxa kunjalo usenokungalufumani uncedo kwesi sifundo. Akukho mfuneko yokuba ufhikelwa nangomama nabakhulelweyo, xa ufhikelwa kukuXakaniseka, singakunika uluhlu lwabantu abafumanekayo nangathethayo nave, xa ufuna ngolo hlobo okanye naxesha liphi na xa ufuna.

**INTLAWULO YOKUTHATHA INXAXHEBA**


**IFOTO**

Singathanda ukukufota phambi kodliwano-ndlebe lokuqala ukuze sincedakale ngokukwazi size sikuchonge xa ufika ngexesha lodliwano-ndlebe lwexesha elizayo emva okuzalwa kosana lwakho. Ukuba uyavuma le foto yakho sakuyigcina kwikhompyutha etshixiweyo ukuze kungabikhoko mntu ufikelelayo kwinkcukachache ngaphandle kwabo bantu baphandayo. Ifoto yakho ayisayi kudityani swa neenkukachachiziqa kusinceda senze izigqibo ngendlela yokuphucula inkxaso.

Kwenzeka Ntone ngokwazi sizathu ezilaphela ukuqalela kuleka nangomama nabakhulelweyo boMzantsi-Afrika.
UKUSHICILELWA KWAMAZWI UKUZE AVAKALE


Ukuba uyithathile inxaxheba kudliwano-ndlebe lwexesha elizayo, nangelo xesha amazwi aza kushicilelwa.

IMFIHLELO

linkcukacha eziqokelelwayo kwesi sifundo azinakudityaniswa inamathetha. Konke oku kuyimfihlelo.


Ukuba kukho imibuzo onayo wamkelelelele ukuba uqhagamshelane neKomiti yemiKhwa esesikweni ye-Ofisi ekwiDyunivesithi yaseStellenbosch. Nantsi idilesi:

Private Bag X1
Matieland 7602
021-938-9075.
IMVUMO YOKUTHATHA INXAXHEBA

Ndiyavuma ukuthatha inxaxheba kwesi sifundo sophando. Oko kuza kunceda ekuqulunqeni inkubo yokuxhasa amakhosikazi akhulelwyo, oomama abaqalayo ukuhulelw, nabantwana balo.

Ndakuyiphendula imibuzo yenu. Imibuzo leyo imalunga nemvelaphi yam, ngeengcinga, ngovakalelo, ngemeko, ngobunzima, ngolwazi nangempilo. Abasebenzayo ngophando bangazihlola iiirekhodi zonyango lwam.

Xa kukho ooMama abangabaCebisi abathunyelwyo ukuba basebenze kwgingqi yam, ndakuthatha inxaxheba xa betyelela amakhaya.

Ndiyaqonda ukuba ndithatha inxaxheba ngokuthanda kwam, yaye ndingayeka ukuthatha inxaxheba nanini na.

Iphendulwe yonke imibuzo yam emalunga nesi sifundo sophando nokuthatha kwam inxaxheba kuso.

Ndiyaiqonda into yokuba ndisenokungancedakali mna ubuqu kolu phando.

Ndiyifumene inombolo yemfono-mfono yomntu xa ndifuna ukuthetha ngemibandela enokuvela ngexesha lemibuzo.

Ndiyaiqonda into yokuba le fom yemvumo ayisayi kudityaniswa nendlela endiphendule ngayo. limpanelo zam zakuhlala ziyimfihlelo.

.................................................. ..................................................

Ukusayina komthathi-nxaxheba: Igama lomthathi-nxaxheba:

.................................................................

Umhla:
UKUSAYINA KOMPHANDI OKANYE KOMYILI:

Kwezam iimbono lo mbandela wenzeka ngokuthanda komntu ozaziyo ukuba uyinikezele ngengqiqo
imvumo, ukwanawo namandla asemthethweni okunikezela ngemvumo eqiqa ukuze ayithathe
inxaxheba kwesi sifundo sophando.

.................................................. ........................
Igama lomPhandi okanye lomYili:

.................................................. ........................
Ukusayina komPhandi okanye komYili:       Umhla:
APPENDIX I
01 December 2009

Prof M Tomlinson
Department of Psychology
Main Campus
Univ of Stellenbosch
7500

Dear Prof Tomlinson

"Home visits interventions in south African townships: Prevention of HIV, Fetal Alcohol Syndrome and malnutrition"

ETHICS REFERENCE NO: N08/08/218

RE: APPROVAL

It is a pleasure to inform you that the Chairman of the Health Research Ethics Committee has approved the sub-study to N08/08/218 on 30 November 2009, including the ethical aspects involved, for a period of one year from this date.

This project is therefore now registered and you can proceed with the work. Please quote the above-mentioned project number in ALL future correspondence.

Please note a template of the progress report is obtainable on www.sun.ac.za/rds/ and should be submitted to the Committee before the year has expired. The Committee will then consider the continuation of the project for a further year (if necessary). Annually a number of projects may be selected randomly and subjected to an external audit.

Translations of the consent document in the languages applicable to the study participants should be submitted.

Federal Wide Assurance Number: 00001372
Institutional Review Board (IRB) Number: IRB0005239

The Health Research Ethics Committee complies with the SA National Health Act No.61 2003 as it pertains to health research and the United States Code of Federal Regulations Title 45 Part 46. This committee abides by the ethical norms and principles for research, established by the Declaration of Helsinki, the South African Medical Research Council Guidelines as well as the Guidelines for Ethical Research: Principles Structures and Processes 2004 (Department of Health).