Child Physical Growth and Care Practices in Kenya

Evidence from Demographic and Health Surveys

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Scientific environment

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Dedication

To the memory of Juliet Nasike (1933-2011) and Melab Nanyama (1931-2010). Researching on child health has compounded my appreciation for the love and care you provided at my tender age. It was a privilege and honour to have shared your exemplary lives.

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Abstract

Background

The aims of this dissertation were to describe trends in child undernutrition in Kenya manifest as poor physical growth, along with trends in feeding care practices, and to examine socio-demographic correlates of child feeding practices. The dissertation also examined the reliability of socio-demographic variables in predicting initiation of breastfeeding within an hour of birth.

Globally, millions of children under the age of five die of conditions associated with undernutrition. The effects of undernutrition do not end at child mortality but have pervasive effects on surviving victims. Undernutrition alters normal brain development, reduces energy levels and limits the rate of motor development in children. The aforementioned biological impairments have been linked to over 200 million children in the developing world not achieving their development potential and perpetuating intergenerational poverty.

Feeding is, of course, a key child care practice. The pattern of infant and young child feeding that provides most benefit is being put to the breast within an hour of birth, exclusive breastfeeding for six months, continued breastfeeding along with complementary foods up to two years of age or beyond, and avoidance of any bottle-feeding. The data show that many children across the world, and particularly in Kenya, are not fed optimally. Consequently, it was estimated in 2011 that globally, about 804,000 children die annually due to sub-optimal breastfeeding and a further 44 million disability-adjusted life years are lost. It is perplexing that the world is still grappling with such loss of life and yet the benefits of optimal breastfeeding to the health and development of the child are enormous. The benefits range from physical, motor, cognitive and psychosocial development of the child to a boosted natural immunity against infection and thus scaling down undernutrition. Breastfeeding also has health benefits for the mother and cumulative benefits to the child in its later years, as it is protective against obesity, diabetes and hypertension.

Despite knowledge of the pervasive effects of undernutrition and the potential effect of optimal infant and young child feeding practices, little is known about their trends, especially within countries in the global south. Research on trends in child growth and care practices has been hindered by the challenges of changing criteria for classifying child undernutrition and optimal care practices. There has also been an emphasis in the literature on international comparisons of countries' situations with little attention to within-country trend analyses. There is need for detailed analyses of child growth and care practices over time. In addition, little is known about the reliability of socio-demographic variables in predicting (in statistical terms) child health care outcomes such as initiation of breastfeeding within an hour of birth. Researchers and policy-makers need reliable statistical models that describe the relationship of possible risk and protective factors to child feeding endpoints such as early initiation of breastfeeding. The development of reliable models in which the early initiation of child breastfeeding is in focus is imperative, because this feeding behaviour has such profound consequences for mother and child health.

Methods

The study used data from the Kenya Demographic and Health Surveys (KDHS) collected in 1993, 1998, 2003 and 2008-09. Analyses in Papers I, II and III were conducted using IBM SPSS version 19. Due to the multi-stage sampling design used by KDHS, the design effect parameters 'sampling weight', 'sample domain' and 'sample cluster' were incorporated in all analyses using SPSS' Complex Samples Module. Logistic regression was used in data analysis in all the three papers.

Child undernutrition was estimated by classifying children as stunted or not (height for age and sex), wasted or not (weight for age and sex) and underweight or not (weight for age and sex) using the most recent recommended WHO growth standards of 2006. To assess child feeding practices, children of ages 0-23 months were considered to have been:

- breastfed early if they were put to breast within one hour after birth,

- exclusively breastfed if they were fed on nothing else other than breast milk in the last 24 hours prior to the KDHS interview,
- complementary fed and breastfed if they were given breast milk as well as any solid, semi-solid or soft foods in the last 24 hours, and
- bottle-fed if a bottle was used for at least part of their feeding in the 24 hours prior to the KDHS interview.

Results

Results in paper I showed that the national trends in the prevalence of child underweight declined, while the trends in wasting and stunting were stagnant. Analyses disaggregated by demographic and socio-economic sub-groups revealed some departures from the overall trends. Wasting trends declined more among girls than among boys, and the opposite was true for stunting, with boys posting a greater decline in the prevalence of stunting compared to girls.

In paper II, trends in exclusive breastfeeding showed significant improvement in most of socio-demographic sub-groups. Conversely, the trends in early initiation of breastfeeding, complementary feeding and breastfeeding, and bottle-feeding were stagnant or slightly worsening in most socio-demographic sub-groups. Multivariate analysis using the 2008-09 data showed that accounting for other variables, the province where the mother resided was the most significant predictor of early initiation of breastfeeding, exclusive breastfeeding and bottle-feeding.

The main finding in Paper III was that the socio-demographic variables that were significantly related to early initiation of breastfeeding in the multivariate analysis using 1998 data were weakly related in analyses using the 2003 and 2008-09 data. Only mode of birth and province of residence reliably predicted early initiation of breastfeeding across the three surveys.

Discussion

Results of paper I and II showed stagnating trends in child growth and feeding practices in Kenya but also important departures in the sub-group analyses. The sex

differences in child growth were consistent with previous studies from sub-Saharan Africa where growth patterns showed slightly lower prevalence in wasting, stunting and underweight for girls as compared to boys. The evidence on reasons for the gender difference is conflicting. The contribution of this dissertation is to suggest that differences in the early feeding of Kenyan boys and girls are insignificant as a factor in child growth differences, but this requires detailed exploration in further research.

Another important finding on trends in paper I and II relates to differences by age in child growth and feeding practices. There was a consistently low prevalence and stable trend in wasting and stunting among youngest children aged 0-5 months from 1993 to 2009 and an increasing trend in exclusively breastfed children at the same age. In the older age groups however, trends were not generally improving. It is possible that some aspect of quality of feeding after age 5 months plays a role in this pattern, and further research is desirable on this aspect of child care in Kenya.

Consistent in the three papers, trends in child growth and care practices differed by province of residence, highlighting the importance of province as a contextual/distal factor in analyses of child growth and feeding practices trends. An analysis in paper III of the reliability of the association between socio-economic and demographic variables and child feeding confirmed that province of residence was a reliable predictor of timing of initiation of breastfeeding over time, but this was not true for other socio-economic and demographic variables. This calls for detailed research at the intra-province level, to illuminate the aspects of provincial living that impact child growth and care. This is a central conclusion of this dissertation: if we can better understand how ‘place’ affects child growth and care, we might be able to fine tune health promotion interventions to make them more sensitive to features of various places – with place referring to province-of-residence, but perhaps also levels of locality much nearer the household.

Abbreviations

MDG:	Millennium Development Goals
UN:	United Nations
DHS:	Demographic and Health Survey
KDHS:	Kenya Demographic and Health Survey
UNICEF:	United Nations Children's Fund
WHO:	World Health Organization
SD:	Standard Deviation
KNBS:	Kenya National Bureau of Statistics
WI:	Wealth Index
SPSS:	Statistical Package for Social Sciences
OR:	Odds Ratio
CI:	95 per cent Confidence Intervals
HIV:	Human Immunodeficiency Virus
KIPPRA:	Kenya Institute for Public Policy Research and Analysis
CBS:	Central Bureau of Statistics (Kenya)

List of publications

Paper I: Matanda, D. J., Mittelmark, M. B., & Kigaru, D. M. (2014). Child undernutrition in Kenya: trend analyses from 1993 to 2008-09. *BMC Pediatrics*, 14(1), 5.

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Paper III: Matanda, D. J., Mittelmark, M. B., Urke, H. B., & Amugsi, D. A. (2014). Reliability of demographic and socioeconomic variables in predicting early initiation of breastfeeding: a replication analysis using the Kenya Demographic and Health Survey data. *BMJ Open*, 4(6), e005194.

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1. INTRODUCTION

This dissertation focuses on child health in Kenya. The health of children is of immense relevance in charting the future of human development. In the beginning of the 21st millennium, 189 countries signed the millennium declaration with the aim of creating an environment conducive for development and the elimination of poverty. The declaration gave birth to the Millennium Development Goals (MDG) with quantified targets to be met by the year 2015 (UN, 2000). The first five MDG (eradicate extreme poverty and hunger, achieve universal primary education, promote gender equality and empower women, reduce child mortality, and improve maternal health) are of great relevance to children's nutritional status, health and development (Bhutta et al., 2010; Gaskin, Nielsen, Willie, & Durant, 2014; Grantham-McGregor et al., 2007; Lozano et al., 2011; Sahn & Stifel, 2003). Of special relevance to this dissertation is MDG1 that seeks to halve the proportion suffering from hunger, indicated by the prevalence of underweight children. Also important is the associated recommendation for improving infant and young child feeding practices -- the initiation of breastfeeding within one hour of birth, exclusive breastfeeding for six months, and continued breastfeeding up to two years and beyond accompanied by appropriate complementary feeding (Bhandari et al., 2003; Bhutta et al., 2008; Huffman, Zehner, & Victora, 2001; Jones, Steketee, Black, Bhutta, & Morris, 2003; Lutter et al., 2011).

Global estimates of progress towards achieving MDG1 show improvement, yet we are far from achievement (Lutter et al., 2011; Stevens et al., 2012). In developing countries as a whole, the prevalence of low weight-for-age (underweight) and low height-for-age (stunting) has decreased from 30 per cent to 19 per cent and 47 per cent to 30 per cent, respectively. However, developing countries have less than a five per cent chance of meeting the MDG 2015 target of underweight prevalence of no more than two per cent. Sub-Saharan Africa, and Kenya in particular, have virtually no chance of achieving the MDG target on child underweight (Stevens et al., 2012).

Sub-optimal child feeding practices in developing countries have contributed to the poor progress in achieving the MDG (Lutter et al., 2011). There is therefore renewed effort to increase investment in nutrition as a key way to advance welfare, with countries urged to scale up nutrition programmes for women of child-bearing age and for children during the critical 1000 first days of life (Bhutta et al., 2013; Lassi, Das, Zahid, Imdad, & Bhutta, 2013). In this connection, one of the critical investments is in high quality health and demographic surveillance programmes, to provide policy-makers with valid and reliable information on maternal and child health and nutrition status and trends. Surveillance data are crucial as the foundation for effective public health action and evidence-based decision-making (Lee & Thacker, 2011; McNabb et al., 2002). Surveillance entails systematic collection, analysis and interpretation of data and timely dissemination to relevant audiences (Lee & Thacker, 2011). The Demographic and Health Surveys (DHS) programme was started in 1984 to produce maternal and child health surveillance data to support policy development, programme planning, monitoring and evaluation (Fabic, Choi, & Bird, 2012). DHS data are collected in over 230 countries, with many countries (including Kenya) repeatedly surveyed over decades with highly similar methodology.

The results of the DHS are published in detailed reports giving cross-tabulated results for virtually all the variables that are included in each survey. However, there is also a need for detailed analyses that go beyond the published DHS cross-tabulations, especially to analyse trends in health and to undertake multivariate analyses to transform simple tabular data into analytical forms useful to public health officials, policy makers and researchers (Fabic et al., 2012). To help meet the need, this dissertation makes use of the Kenya Demographic and Health Survey (KDHS) data and presents analyses intended as a platform for better public health planning and decision-making to improve Kenyan children's care and health.

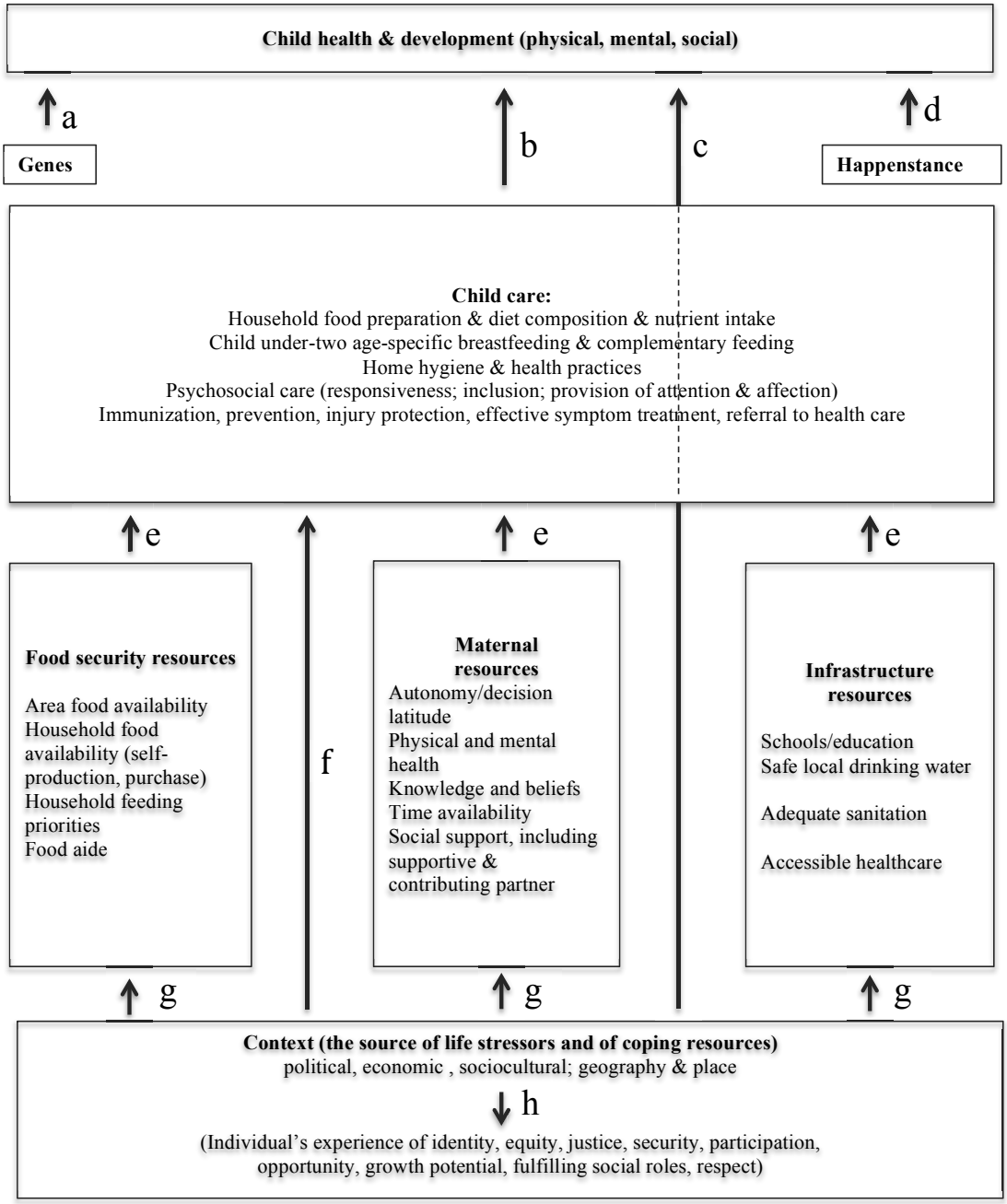
The importance of child care is sombrely captured by the words of the former UN Secretary General Kofi Annan:

> *"much of the next millennium can be seen in how we care for our children today. Tomorrow's world may be influenced by science and technology; but more than anything else, it is already taking shape in the bodies and minds of our children"* (UNICEF, 1998).

The phrase 'care for our children' deserves special attention. Child care has many facets, not least of which is medical care, important to prevent and treat diseases, disabilities and injuries. Yet child care is obviously much more than medical care. This is shown in Figure 1, an adapted model of child care with special focus on the pathways to health that emphasise resources for health and the many aspects of child care that are part and parcel of home and community life (Engle, Menon, & Haddad, 1997; Smith & Haddad, 2000; UNICEF, 1990).

This view of child care is in concert with the ideas of health promotion as espoused by the Ottawa Charter's definition of health as a resource for everyday life (Mittelmark, 2005; WHO, 1986). In contrast to the risk factor approach to disease, the resource approach to health identifies protective and health promoting factors that support health and wellbeing. This view of child care recognizes people as more than just consumers of healthcare services. They are also co-producers of their own health, with the capacity to contribute to their own health promotion and the health of those under their care (Morgan & Ziglio, 2007).

Figure 1: Model of child care. [a]



[a] Adapted by the Research Unit for Social Determinants of Health in Very Poor Ruralities (MB Mittelmark Director), University of Bergen Research Group *Multicultural Venues in Health, Gender and Social Justice* (http://www.uib.no/rg/mcvenues), from UNICEF, 1990; Engle, Menon and Haddad, 1999; Smith and Haddad, 2000.

1.1 Background

1.1.1 Child undernutrition

Child undernutrition is the state when the body lacks adequate energy, protein and micronutrients for body maintenance, growth and development (Latham, 1997). A chronic shortage of appropriate types and quantities of food, and/or with disease, may cause children to experience long-term faltering in physical growth. They grow in height more slowly than expected in children of the same sex and age, a classical indicator of undernutrition termed 'stunting' (WHO, 2006). A short-term deficit in physical growth due to acute food shortage and/or infection/illness is an indicator of undernutrition referred to as 'wasting'. Wasted children gain weight more slowly than expected in children of the same sex and height (WHO, 2006). A third indicator of undernutrition is 'underweight', which is a composite indicator of stunting and wasting and thus an overall indicator of the extent of child undernutrition. Underweight children gain weight more slowly than expected of children of the same sex and age (WHO, 2006). According to the 2006 World Health Organization (WHO) classification standards for child undernutrition, children with a Z-score below − 2 Standard Deviations (SD) of the median for weight-for-height/length, height/length-for-age, and weight-for-age are classified as wasted, stunted and underweight, respectively. Children with a Z-score below − 3 SD of the median are classified as severely undernourished, while those with a Z-score between − 2 SD and − 3 SD are classified as being moderately undernourished. Those with a Z-score between − 1 SD and − 2 SD are classified as mildly undernourished.

Global estimates of undernutrition in 2011 showed that 165 million (26 per cent) children under-five were stunted, 52 million (8 per cent) were wasted and 101 million (16 per cent) were underweight. The global burden of undernutrition is not evenly distributed, with higher prevalence in sub-Saharan Africa compared to other regions. It has been estimated that 56 million (36 per cent) children under-five in Africa are stunted, 13 million (9 per cent) are wasted and 28 million (18 per cent) are underweight (Black et al., 2013). Kenya's prevalence as per the latest survey

conducted in 2008-09 indicated that stunting prevalence was 35 per cent, wasting was 7 per cent and underweight was 16 per cent (KNBS, 2010).

More encouragingly, global trends in child undernutrition from 1990 to 2011 indicate declines in all indicators. Stunting declined by 35 per cent, wasting by 11 per cent and underweight by 37 per cent (Black et al., 2013). However, the observed global reductions in undernutrition mask important regional and country variations (Sahn & Stifel, 2003; Stevens et al., 2012). For example, progress in lowering stunting, wasting and underweight in sub-Saharan Africa has stagnated with children residing in rural areas posting higher prevalence as compared to those living in urban areas (Sahn & Stifel, 2003).

While the data just cited focus on undernutrition conceptualised as physical growth deficits, which are relatively easy to measure, the untoward manifestations of undernutrition have many facets. Globally, child undernutrition was association with over 3.1 million deaths of children under the age of five years in 2011 (Black et al., 2013). Yet the magnitude of the underestimate is not known due to incomplete child mortality reporting in many parts of the world. The effects of undernutrition are not only linked to child mortality but have pervasive effects on surviving victims (Pelletier, Frongillo, Jr, Schroeder, & Habicht, 1995; Victora et al., 2008). Undernutrition alters normal brain development, reduces energy levels and limits the rate of motor development in children (Brown & Pollitt, 1996; Pollitt et al., 1996). These biological impairments have been linked to poor cognitive ability and educational development, resulting in over 200 million children in the developing world not achieving their potential (Grantham-McGregor et al., 2007). Poor growth in childhood is also likely to influence adulthood stature (Gigante, Nazmi, Lima, Barros, & Victora, 2008; Rivera, Martorell, Ruel, Habicht, & Haas, 1995). Stunted children in rural Senegal remained smaller in adulthood as compared to their non-stunted peers, while adopted Indian girls in Sweden with less height for their age at childhood posted below the reference mean height at the onset of their puberty (Coly et al., 2006; Proos, Karlberg, Hofvander, & Tuvemo, 1993). Contrary, better nutritional status aids better child development as exemplified by the improvement in height-for-

age Z-scores among children residing in rural Zimbabwe that was associated with increased height in adulthood, increased number of school grades completed and earlier age at which children started school (Alderman, Hoddinott, & Kinsey, 2006). While undernourished children may experience compensatory growth (catch-up growth) later in life, there is a risk involved, as catch-up growth has been associated with chronic diseases in adulthood (Barker, 2002; Bhargava et al., 2004; Hales & Barker, 2001).

By compromising children's physical and cognitive development, undernutrition diminishes their chances of success later in life. Adults who experienced undernutrition in childhood are likely to have less physical work capacity and earn less income as compared to those who were well nourished in childhood (Haas et al., 1995; Hoddinott, Maluccio, Behrman, Flores, & Martorell, 2008). Positive correlations have been documented between physical stature (height and body mass index) with higher wages, with the likelihood of height having a direct effect on wages through strength (Thomas & Strauss, 1997). Lifelong cognitive impairment is another pathway through which undernutrition limits socio-economic progress with research showing associations between undernutrition during childhood and poor educational achievements and lower incomes later in life (Barker, Eriksson, Forsén, & Osmond, 2005). Undernutrition perpetuates intergeneration poverty and exerts a huge burden for nations whose future citizens are likely not to be as healthy and as productive as they could have been (Smith & Haddad, 2014; UNICEF, 2013).

1.1.2 Child feeding practices

As depicted in Figure 1, child feeding practices are an essential aspect of child care. The global strategy for infant and young child feeding gives guidelines on optimal child feeding practices (WHO, UNICEF, 2003). The following section highlights some of the optimal child feeding practices with an emphasis on those addressed in the published Papers of this dissertation.

1.1.2.1 Breastfeeding initiation

Early initiation of breastfeeding refers to putting a new-born to breast within one hour after birth (WHO, 2008). Globally, only 42 per cent of new-borns are put to the breast within an hour of birth with the proportion increasing slightly in sub-Saharan Africa at 48 per cent in 2011 (Black et al., 2013). Kenya's latest prevalence indicates that 58 per cent of children under-five are put to breast within an hour of birth (KNBS, 2010).

One of the major benefits of early initiation of breastfeeding is the transmission of colostrum that boosts the child's immunity (Hanson & Korotkova, 2002; Isaacs, 2005). Colostrum helps prevent common neonatal respiratory infections, otitis media and diarrhoea, that are major causes of childhood morbidity and mortality in the developing world (Edmond, Kirkwood, Amenga-Etego, Owusu-Agyei, & Hurt, 2007; Lawrence & Pane, 2007). The psychosocial mechanisms linking early initiation of breastfeeding to child health includes the skin-to-skin contact between the mother and the baby, which stimulates mother-infant bonding important for the child's emotional and cognitive development (WHO, 1998). The effect of the skin-to-skin contact and suckling also lessens the effects of stress experienced by children during birth (Bystrova et al., 2003). It also modulates the child's temperature, that in turn helps to prevent hypothermia and hypoglycaemia, conditions that can endanger the life of the neonate in the first week (Bystrova et al., 2003; Huffman et al., 2001).

Mothers who put their new-borns to breast within an hour of birth also stand to benefit from the practice. The early contact through suckling of the breast or hand massage by the new-born causes uterine involution which aids reduction in postpartum haemorrhage, expulsion of the placenta, and triggers early milk let-down (Eglash, Montgomery, & Wood, 2008; Matthiesen, Ransjö-Arvidson, Nissen, & Uvnäs-Moberg, 2001). Mothers who practice early initiation of breastfeeding are also likely to be successful in practicing other optimal breastfeeding behaviours, such as exclusive breastfeeding for six months and longer (Salariya, Easton, & Cater, 1978; Tawiah-Agyemang, Kirkwood, Edmond, Bazzano, & Hill, 2008).

1.1.2.2 Exclusive breastfeeding

Exclusive breastfeeding means that during the first six months of life, an infant receives only breast milk and no other liquids or solids with the exception of oral rehydration solution, vitamins, mineral supplements and medicines (WHO, 2008). Before the introduction of the present guideline of exclusively breastfeeding for six month, mothers were advised to breastfeed exclusively for four to six months before introduction of complementary foods (Lutter, 2000). The change to six months was informed by the conclusion that infants exclusively breastfed for six months were less prone to morbidity from gastrointestinal infection and showed no faltering in growth, as compared to those exclusively breastfed for four to six months (Fewtrell et al., 2007).

Statistics indicate that in 2011, 39 per cent of children were exclusively breastfed for six months after birth at a global level, and 41 per cent in sub-Saharan Africa (Black et al., 2013). The 2008-09 KDHS indicates that only 32 per cent of children in Kenya were fed on breast milk exclusively for the first six months after birth (KNBS, 2010). The insistence on feeding a new-born solely on breast milk for six months comes against the backdrop of the numerous advantages it has over mixed feeding (Kramer & Kakuma, 2007). To begin with, exclusive breastfeeding lowers the risk of gastrointestinal infection and thus prevents diarrhoea that is a common cause of mortality in children (Bhandari et al., 2003; Kramer et al., 2003; Quigley, Kelly, & Sacker, 2007). Exclusive breastfeeding has a positive effect on infant motor development. Exclusively breastfed children are likely to crawl sooner and more likely to walk by one year of age, as compared to those experiencing mixed feeding (Dewey, Cohen, Brown, & Rivera, 2001). Mothers who exclusively breastfeed experience relatively rapid weight loss after birth and an extended period of postpartum amenorrhoea (Dewey et al., 2001). The prolonged amenorrhoea can serve as a contraception function, and thus improve child spacing (Labbok et al., 1997; Perez, Labbok, & Queenan, 1992; Sipsma, Bradley & Chen, 2013). In relation to Human Immunodeficiency Virus (HIV), failure to exercise exclusive breastfeeding

for the first six months increases the risk of mother-to-child transmission via breast milk (Coovadia et al., 2007; Iliff et al., 2005).

1.1.2.3 Complementary feeding

The term complementary feeding is used pragmatically in this dissertation to refer to appropriate feeding of solid, semi-solid and soft foods to children from six months of age and continued breastfeeding for two years or beyond (WHO, 2008). The age 6-23 months is a critical period when breast milk alone is no longer sufficient to meet the increasing nutritional requirements of the infant. Globally, 60 per cent of children received solid, semi-solid or soft foods at six to eight months while 58 per cent were breastfed for at least two years in 2011 (Black et al., 2013; UNICEF, 2013). Kenya's prevalence indicate that 83 per cent of children under five in 2008-09 received complementary foods at six to nine months and 54 per cent were still being breastfed at ages 20 to 23 months (KNBS, 2010).

After six months, the child's nutrient and energy needs exceed what breast milk alone can offer and therefore the quality and quantity of the food provided is critical. Appropriate complementary feeding is thus important in enhancing child health and can reverse undernutrition (Imdad, Yakoob, & Bhutta, 2011). Continued breastfeeding after six months is recommended because breast milk provides more than half of a child's energy needs between 6-12 months, and one third of energy needs between ages12-23 months (Dewey, Brown, & others, 2003). Breast milk is also a crucial source of nutrients and energy during illness, when the child's appetite for other foods is suppressed (Brown, Stallings, de Kanashiro, de Romana, & Black, 1990).

Breastfeeding alone beyond six months is associated with faltering child growth (Shrimpton et al., 2001), even if the evidence is somewhat mixed (Bhutta et al., 2008; Caulfield, Bentley, & Ahmed, 1996). Some studies in poor settings have demonstrated a positive association between continued breastfeeding and child linear growth (Onyango, Esrey, & Kramer, 1999; Simondon, Simondon, Costes, Delaunay, & Diallo, 2001). In relation to the long-term benefits of continued breastfeeding to

the mother, there is increasing evidence of reduced risk of breast and ovarian cancer among mothers who breastfeed (Bernier, Plu-Bureau, Bossard, Ayzac, & Thalabard, 2000; Collaborative Group on Hormonal Factors in Breast Cancer, 2002; Rosenblatt & Thomas, 1993).

1.1.2.4 Bottle-feeding

A bottle-fed child is one who received any food or drink (including breast milk) from a bottle with a nipple/teat regardless of whether or not that child was breastfed (WHO, 2008). Bottle-feeding is highly discouraged and care providers of infants who cannot breastfed are advised to use a spoon or cup to feed the baby. Global estimates of bottle-feeding vary across the different regions of the world, with sub-Saharan Africa experiencing an increase among women of higher socioeconomic status and those living in urban areas (Boerma, Rutstein, Sommerfelt, & Bicego, 1991; Walker & Adam, 2000). Bottle-feeding is not uncommon in Kenya, with 25 per cent of children under the age of six months reported to be fed using a bottle with teat in 2009 (KNBS, 2010). The dangers associated with bottle-feeding include interference with optimal breastfeeding practices, poor attachment of the baby to the breast, and early cessation of breastfeeding (Howard et al., 2003; Winikoff & Laukaran, 1989). Bottles with a nipple are prone to contamination, especially in settings with poor hygiene. Consequently, using the bottle as a mode of feeding increases the risk of child morbidity and mortality (Welbourn, 1958; WHO, 2008).

The above summary of infant and young child feeding practices clearly shows that children across the world are not fed optimally. It is estimated that globally, about 804,000 children die annually due to sub-optimal breastfeeding (Black et al., 2013). Sub-optimal breastfeeding was further associated with approximately 44 million disability-adjusted life years in 2008 (Black et al., 2008). These statistics raise serious alarm, given that optimal breastfeeding remains at the core of achieving the MDG, especially MDG 4 that intends to reduce under five mortality rates by two-thirds by 2015, and MDG 5 that intends to cut by three-fourths the maternal mortality ratio (Jones et al., 2003). There is an obvious need to improve the trends in infant and

young child feeding practices, also in Kenya, because optimal breastfeeding offers a good starting point for effective health promotion (Gupta, 2006; Labbok, 2006; WHO,UNICEF, 1990; WHO, UNICEF, 2003).

1.2 Conceptual framework

The conceptual framework underpinning this study (Figure 1) is informed by UNICEF's conceptual frameworks on child health and nutrition of 1990 and 1998; the works of Engel, Menon and Haddad on child care (Engle et al., 1997; Smith & Haddad, 2000; UNICEF, 1990, 1998). The conceptual framework guiding this study is thus an adaptation of these previous models with an emphasis on resources for child care. The framework acknowledges that child health and development is influenced by factors beyond individuals' control including one's genes (arrow a in Figure 1) and happenstance (d), but also by child care in its many manifestations. As a general framework, the concepts of health and development are quite broad, providing room for the many ways in which health is conceptualised in literature. As has already been explained, health in this dissertation is defined in terms of physical growth.

The framework indicates a number of main and mediating effects, but for the sake of simplicity, it does not specify moderating effects, of which there are likely many. The framework illustrates that a child's context may affect health in three ways: directly (c), via effects on child care resources (e), and via direct effects on child care (f). A child's context has not only effects on health but also on all aspects of her life experience (h). This conceptual framework is the starting point for explication of the analytical framework for this dissertation, presented in a later section.

1.2.1 Child care

Care refers to the time, attention and support given to the child and other household members at a household and community level, to enable them meet their physical, mental and social needs (Engle et al., 1997). In the present framework, care practices include observing good home hygiene and health practices, ensuring that food

prepared at home is of good quality, adhering to the recommended optimal breastfeeding and complementary feeding practices, provision of psychosocial care, and administering of various preventive and treatment services. Child care is differentiated from child care resources based on the degree of direct impact on a child. For example, even when health care is accessible (a resource), it may or may not translate into the immunization of the child (child care) depending on many other factors illustrated by the framework.

The importance of the various care practices in enhancing child health and development has been thoroughly documented (Arimond & Ruel, 2004; Black et al., 2008; Engle & Lhotska, 1999; Onyango et al., 1999; Ruel, 2003b; Ruel, Levin, Armar-Klemesu, Maxwell, & Morris, 1999). To begin with, the quality of the food fed to a child, measured in terms of dietary diversity, has been shown to have an effect on child growth with consumption of multiple foods leading to better nutritional status (Arimond & Ruel, 2004; Ruel, 2003a, 2003b). The quality of the food prepared is only as good as the hygiene and health practices around the home. Factors such as hygienic handling, preparation and storage of food, availability of clean water, and improved sanitation are important variables for child health and development (Armar-Klemesu, Ruel, Maxwell, Levin, & Morris, 2000; Engle & Lhotska, 1999).

As already addressed, appropriate age-specific breastfeeding and complementary feeding has benefits related to the physical, motor, cognitive and psychosocial development of the child (Gupta, 2006; Hoddinott et al., 2008; Labbok, 2006). Closely related to age-specific breast and complementary care is the psychosocial care in terms of affection and attention to the child. This involves caregiver's practices that influence child's food intake such as the use of finger foods; caregiver's responsiveness to the child's feeding situations such as encouraging the child to eat and not forcing the child to eat; and interacting physically, visually, and verbally with the child (Engle, Menon, & Haddad, 1999; Kröller, Jahnke, & Warschburger, 2013). Connected to psychosocial care is the health seeking behaviour of the caregiver. This involves protecting children's health by ensuring that they receive essential

healthcare promptly when sick and attain full immunization to prevent diseases. Evidence shows that good caregiving practices related to health seeking behaviour are strong determinants of children nutritional status (Ruel et al., 1999).

1.2.2 Resources for care

The success of the aforementioned care practices in ensuring better child health and development depends on the resources at the caregiver's disposal. These are food security resources, maternal resources and infrastructure resources. The utilisation of these resources is influenced heavily by contextual factors.

1.2.2.1 Food security

A household that is food secure has sustainable access to safe food sufficient in quantity and quality that allows household members to live an active and healthy life (Smith & Haddad, 2000). Secure access to food has four dimensions: i) the food is sufficient in calories needed for an active and healthy life, ii) the food is accessible in terms of entitlement to produce, purchase, exchange or receive it as a gift or aid, iii) there is security of food defined by the connections between vulnerability, risk and insurance, and iv) the length of time at which food insecurity is experienced (long-term, short-term or cyclical) (Maxwell & Smith, 1992). Even though caution is exercised in directly linking food security to child nutritional status (Bhattacharya, Currie, & Haider, 2004), limited access to food has often been used as an alternative indicator of undernutrition (Chen & Kates, 1994; Kennedy & Peters, 1992).

Household food security is dictated by a host of factors, among which are population growth, place of residence (urban/rural), the sex of the head of the household, employment status, weather/climatic conditions and government policies (Gladwin, Thomson, Peterson, & Anderson, 2001; Levin et al., 1999; Rosegrant & Cline, 2003; Timmer, 2000). For example, the rapid increase in population characterized by high rates of urbanization and poverty may precipitate food insecurity in urban households (Chen & Kates, 1994; Godfray et al., 2010; Maxwell, 1999). In sub-Saharan Africa where food production depends on sufficient rainfall, changing weather patterns have

had adverse effects on the quantity of food produced (Sutherland, Irungu, Kang'ara, Muthamia, & Ouma, 1999).

1.2.2.2 Maternal resources

The second group of child care resources includes those which a mother (or other primary caregiver) can draw on. Maternal autonomy, which refers to a woman's power in the household and her ability to influence and change her environment, has been shown to impact positively on child health outcomes (Engle et al., 1999; Gupta, 1995). Women with comparatively high levels of autonomy are less likely to have children with poor growth (Sethuraman, Lansdown, & Sullivan, 2006; Shroff, Griffiths, Adair, Suchindran, & Bentley, 2009). It has been suggested that the pathway through which maternal autonomy influences child health is through care whereby higher autonomy is positively correlated with better feeding practices and better growth (Shroff et al., 2011). In contrast, lack of maternal autonomy limits women's opportunity to interact with each other, restricting transmission of knowledge about health issues and child care, with negative impacts on child health and development (Ramalingaswami, Jonsson, & Rohde, 1996).

Maternal physical and mental health is another maternal resource that influences the type of care provided to the child. Maternal physical deficiencies such as anaemia, stunting and low body mass index influences caregiving by reducing energy needed to provide care (Engle et al., 1999). Iron deficiency that cause anaemia alters mother-child interactions, and mothers may become less responsive to their children's cues, contributing to poorer child development (Beard et al., 2005; Perez et al., 2005). Closely related to physical health is maternal mental health. Mental health problems such as stress and depression are risk factors for poor child care and increased risk of growth retardation (Edwards, Holden, Felitti, & Anda, 2003; Patel, Rahman, Jacob, & Hughes, 2004; Rahman, Iqbal, Bunn, Lovel, & Harrington, 2004).

Maternal knowledge and beliefs, indirectly indicated in many studies by maternal education level, are central to child health and development as mediated by care practices. This seems due in part to the economic advantage associated with

education and the knowledge accumulated as a result of attending school (Barrera, 1990; Brody, Flor, & Gibson, 1999; Cleland & Van Ginneken, 1988). Maternal knowledge has many dimensions, one of which is practical knowledge concerning nutrition. It has been documented that practical knowledge in nutrition could be as or more important than educational attainment in predicting child growth (Appoh & Krekling, 2005). There is a positive association between educational attainment and maternal health seeking behaviour, and evidence suggests that this follows from educated women abandoning traditional beliefs and practices that are deleterious to child health (Frost, Forste, & Haas, 2005; Ware, 1984).

The time available to the mother to interact and provide care to the child is partly dictated by the burden of domestic chores (unemployed mothers) and employment (Bianchi, 2000). Because of the workload involved, studies have shown that fulltime employed mothers are less likely to find time for their children, and the use of alternative care by employed mothers has the potential of negatively effecting child health and development (Bernal, 2008; Lamontagne, Engle, & Zeitlin, 1998; Nair, Ariana, & Webster, 2014). Related to time availability for child care is the issue of social support for the mother. Research has shown that mothers with larger social support networks were more likely to be responsive when interacting with their children, and their children exhibit stronger attachment (Burchinal, Follmer, & Bryant, 1996; Jacobson & Frye, 1991).

1.2.2.3 Infrastructure

Infrastructure resources such as educational institutions, accessible sources of clean drinking water, good sanitation facilities, accessible healthcare and proper shelter are prerequisites for enhanced child care and health (Lavy, Strauss, Thomas, & De Vreyer, 1996; Thomas & Strauss, 1992; Gamper-Rabindran, Khan, & Timmins, 2010; Jalan & Ravallion, 2003). Services such as immunization, treatment of illness and other antenatal and postnatal care services provided by health institutions must be available if mothers are to use them to promote their children's health and development (Lavy et al., 1996; Linnemayr, Alderman, & Ka, 2008; Rutherford,

Mulholland, & Hill, 2010). Perhaps just as important as the availability of services is the degree to which services are culturally appropriate (Anderson, Scrimshaw, Fullilove, Fielding, & Normand, 2003).

1.2.3 Context

As shown in the conceptual framework (Figure 1) and further explained by Smith and Haddad (2000), the potential resources available to a country or community are defined by its natural environmental endowment, technological advancement and the quality of the available human capital. The country's or community's political and economic situation, and social-cultural environment influences how these resources are used to ensure households are food secure, mothers are well empowered to provide optimum care and households are located in a better health environment with adequate infrastructural resources. The political, economic, sociocultural and geographical context partly determines people's experience of identity, equity, justice, security, participation, opportunity, growth potential, social roles and respect. How these contextual factors may influence child health and development is discussed next.

To begin with, there is compelling evidence that sex differences in child undernutrition prevalence have contextual roots (Wamani, Åstrøm, Peterson, Tumwine, & Tylleskär, 2007; Crognier, Baali, Hilali, Villena, & Vargas, 2006; Cronk, 1989). In some societies, male children are favoured and are fed first while in some other societies, it is the opposite. It has also been argued that since in most African societies women are likely to stay at home and prepare the food with the help of their female children, who are thereby better placed to eat more as compared to boys who mostly spend less time at home during the day (Crognier, Baali, Hilali, Villena, & Vargas, 2006; Cronk, 1989). Nevertheless, there is some convergence that male children are more vulnerable when subjected to the same health inequalities as compared to their female counterparts (Crognier et al., 2006; Cronk, 1989; Hill & Upchurch, 1995).

Child undernutrition and feeding practices differ depending on the household's socio-economic status (Frost et al., 2005; Urke, Bull, & Mittelmark, 2011; Van de Poel, Hosseinpoor, Speybroeck, Van Ourti, & Vega, 2008). Child undernutrition disproportionately affects the poor due to their inability to sustainably access quality food in adequate quantity and access services that require financial ability (Deolalikar, 1996; Hatløy, Hallund, Diarra, & Oshaug, 2000; Van de Poel et al., 2008). Lower socioeconomic status is also related to limited accessibility to health facilities, inadequate access to potable water and living in an environment characterized by poor sanitation facilities (Mariko & Hughes, 2006). The relationship between feeding practices and socioeconomic status is mixed comparing developing and developed countries. For example, women with higher social economic status in developed countries are likely to initiate breastfeeding earlier and breastfeed longer while those in developing countries are likely breastfeed for a shorter duration and introduce complementary foods early (Dennis, 2002; Walker & Adam, 2000).

An especially prominent expression of the power of context is the pronounced urban and rural difference in child undernutrition (Smith, Ruel, & Ndiaye, 2005; Trussell, Grummer-Strawn, Rodriguez, & Vanlandingham, 1992). Urban areas in sub-Saharan Africa have consistently posted better child nutritional status as compared to rural areas. This has been attributed to a cluster of many factors that differ systematically between urban and rural settings, including maternal education level, income, decision-making power of women relative to men, and availability of health services, and water and sanitation services – all of which are more favourable to child care and health in urban areas (Smith et al., 2005). However, due to the high rural-to-urban migration patterns, this advantage enjoyed by urban areas has been fading with an increase in urban poverty. The high socio-economic status among women in urban areas has also been counter-productive for breastfeeding practices (Walker & Adam, 2000). Urban women are more likely than rural women to stop breastfeeding early due to job engagement, influence from western culture, and their capability to afford breastfeeding substitutes (Government of Kenya, 2011; Huffman, 1984).

1.3 Research gaps

There are three main gaps in the current literature that are the focus of this dissertation.

First, locally-sensitive trend analysis of child undernutrition has been hindered by the challenges of changing criteria for classifying undernutrition, and an emphasis by researchers on international comparisons of countries' situations (Black et al., 2008, 2013; WHO, 2006). Little is known about within-country trends because sub-group analyses are rare (Abuya, Ciera, & Kimani-Murage, 2012; Bloss, Wainaina, & Bailey, 2004; Friedman et al., 2005; Frost et al., 2005; Olack et al., 2011; Wamani et al., 2007). Studies that have undertaken sub-groups analyses in Kenya are inadequate either because the design was a single cross-sectional survey and therefore not useful to define trends over time, or because the study sample was not nationally representative, or because the study was conducted before 2006 and therefore used the outdated reference standards for child growth (Abuya et al., 2012; Bloss et al., 2004; Friedman et al., 2005; Olack et al., 2011).

Second, trends in child feeding practices within socio-demographic sub-groups within countries have been neglected in favour of macro analyses (inter-country comparisons) (Trussell et al., 1992; Walker & Adam, 2000). Yet there is good reason to suppose that important differences in feeding practices exist across the different demographic and socio-economic segments within countries (Kimani-Murage et al., 2011; Onyango et al., 1999; Wilmoth & Elder, 1995). The changes in the WHO recommendations on optimal infant and young child feeding practices have also made it a challenge to study feeding trends over time (Lutter, 2000; WHO, UNICEF, 2003).

Third, little is known about the reliability of socio-demographic variables in predicting critical child feeding practices such as the timing of initiation of breastfeeding. Replication analysis is not common, even if replicability is a highly regarded quality criterion in research (Valentine et al., 2011). Studies of replicability are less prioritised and have always been difficult to publish across the wide range of behavioural and social sciences that contribute to public health research (Lindsay &

Ehrenberg, 1993; Schmidt, 2009). The major hindrance to replication analysis has been the variation in measurement of variables under study that complicates not only replication analysis, but also other forms of comparative studies such as systematic reviews (Armstrong et al., 2007).

1.4 Study aims and objectives

This dissertation addressed the above research gaps by undertaking trend analyses of child undernutrition and feeding practices in defined sub-groups in Kenya. The study used the updated WHO child growth standards and the recommended optimal child feeding practices. The datasets used in the analyses are nationally representative and collected from four cross-sectional surveys conducted in 1993, 1998, 2003 and 2008-09. Also studied was the reliability of predictors of early initiation of breastfeeding by comparing four regression models generated with data from the most recent surveys. The study objectives are as follows (also summarised in Figure 2):

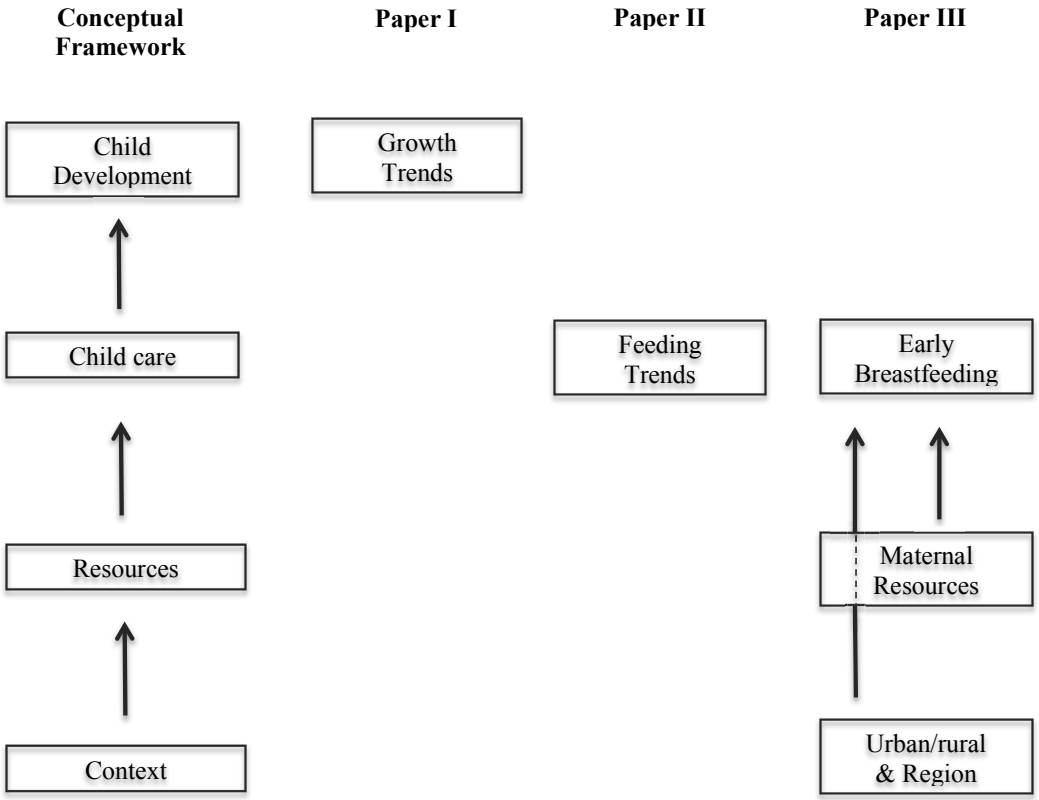
i) To describe sub-group trends in stunting, wasting and underweight in Kenya from 1993 to 2008-09 using the 2006 WHO child growth standards. (Paper I)

ii) To describe sub-group trends in early initiation of breastfeeding at 0-23 months of age, exclusive breastfeeding at 0-5 months of age, complementary feeding and breastfeeding at 6-23 months of age, and bottle-feeding at 0-23 months of age using measures and definitions recommended by WHO. (Paper II)

iii) To examine multivariate relationships between socio-demographic factors and feeding practices with data from 2008-09, the most recent available data. (Paper II)

iv) To examine the reliability of socio-demographic variables in predicting initiation of breastfeeding within an hour of birth, using data from 1998, 2003 and 2008-09. (Paper III)

Figure 2: Study objectives.



2. MATERIALS AND METHODS

2.1 Design, procedures and samples

The study used the Kenya Demographic and Health Survey data collected in 1993, 1998, 2003 and 2008-09. These datasets are national household-based surveys conducted by the Kenya National Bureau of Statistics in partnership with other governmental and non-governmental organisations. Technical assistance in data collection, management and analysis was provided by ICF Macro through the MEASURE DHS programme, which assists developing countries in collecting data on fertility, family planning, and maternal and child health (CBS, 1994, 1999, 2004; KNBS, 2010).

The KDHS used a two-stage cluster sampling design in all the four surveys whereby enumeration areas (clusters) were first drawn from a national master sample frame. Thereafter, households were listed in each of the selected clusters using the most recent national census data. From the listed households, a sample of households is selected using equal probability random selection (ICF International, 2012). Due to the multi-stage sampling design, DHS calls for use of sample weights during analysis. Apart from the 1993 survey that used four types of questionnaires (with an addition of the service availability questionnaire), all the other surveys used three questionnaires: a household enumeration form, a woman's questionnaire and man's questionnaire.

A household form was used to enlist all members and visitors in the household capturing basic information including age, sex, education, and relationship to the head of the household. This was done to identify women and men eligible for the individual interview, and data were also collected on household characteristics -- for example its source of drinking water, type of toilet facility and the type of material used for house construction. The household questionnaire was also used to record anthropometric measurements of women of ages 15-49 and children below five years.

The women's and men's questionnaires were used to conduct individual interviews whereby women aged 15-49 and men aged 15-54 years were eligible. In cases where a household had more than one eligible woman, a random selection procedure was used to select one woman interviewee per household. The two interview questionnaires were based on the standard DHS Model A questionnaire, used in the other developing countries, with slight adjustments done through consultations with technical institutions, government agencies, and local and international organizations, to reflect the Kenyan context. The questionnaires were then translated from English into Kiswahili and other local languages. A detailed description of survey design, data collection procedure and preliminary analysis can be found in the various KDHS reports (CBS, 1994, 1999, 2004; KNBS, 2010). A sample questionnaire of the latest survey carried in 2008-09 has also been attached in the appendix of this dissertation.

The number of clusters selected, households sampled and eligible women for the individual interview (from which all the data used in this study were obtained) and response rates are summarised in Figure 3.

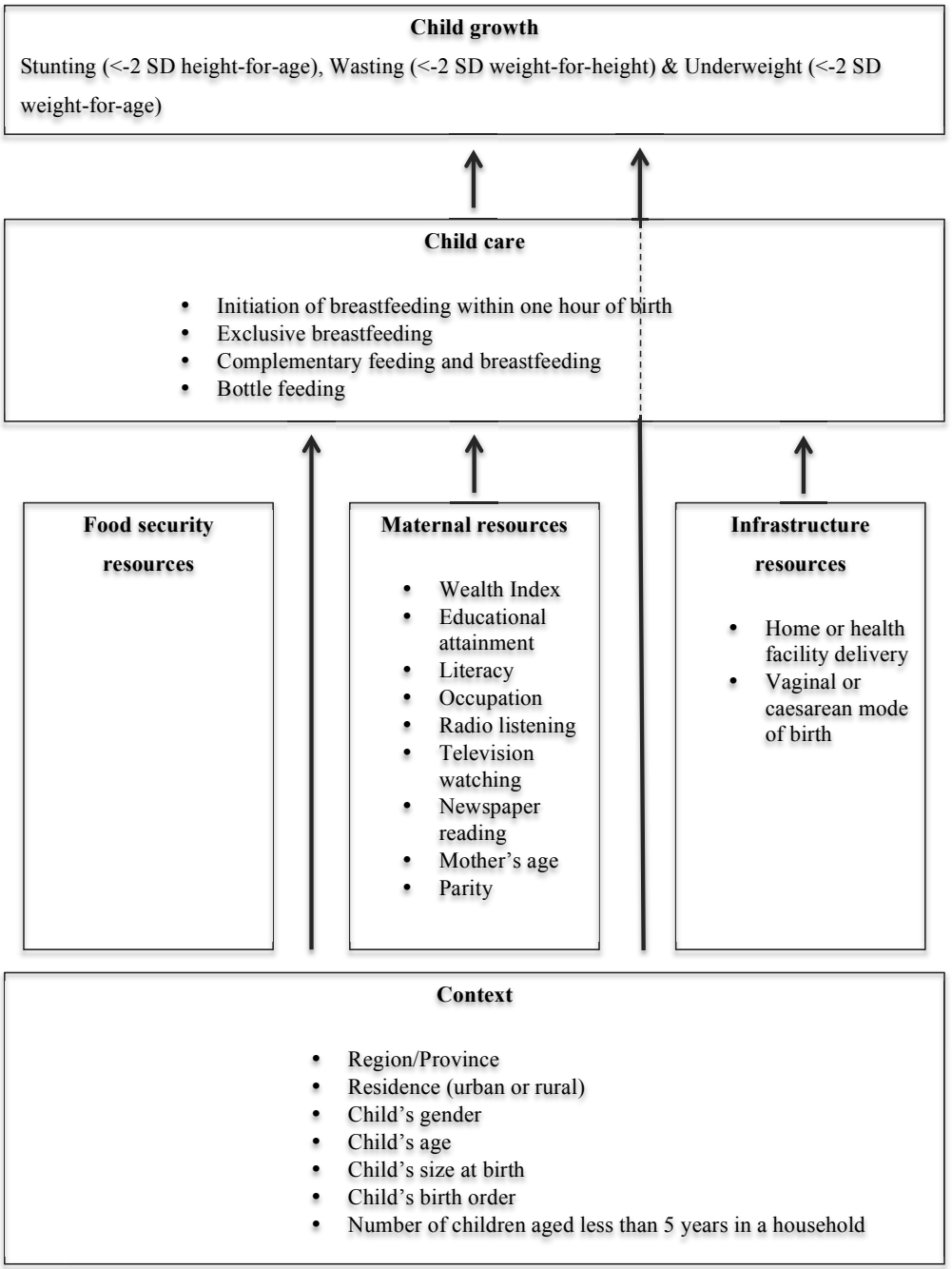
Figure 3: Sampling design

	KDHS 1993	KDHS 1998	KDHS 2003	KDHS 2008-09
Number of Clusters	536	536	400	400
Household interviews				
Households sampled	8,805	9,465	9,865	9,936
Household interviewed	7,95	8,380	8,561	9,057
Response rate (%)	97.1	96.8	96.3	97.7
Individual interviews				
Eligible women	7,952	8,233	8,717	8,767
Women interviewed	7,540	7,881	8,195	8,444
Response rate (%)	94.8	95.7	94.0	96.3

2.2 Measures

Figure 4 is an illustration of the variables used in the analysis, concert with the conceptual framework shown in Figure 1.

Figure 4: Analytical framework as guided by the model of care (Fig 1)



2.2.1 Child growth

The study used child nutritional status (undernutrition) as an indicator of child health and development. Child undernutrition was operationalised as poor growth (stunting, wasting and underweight) since a child's growth (height and weight for its age and sex) is a relatively easily measurable indicator of its underlying nutritional status. Undernutrition is signalled by extremes in the relationship between height and weight for age and sex. In this study, undernutrition was estimated by classifying children as stunted or not (height for age and sex), wasted or not (weight for age and sex) and underweight or not (weight for age and sex).

Child anthropometric measurements (weight, height, and age) were taken to derive the indices, height-for-age (stunting), weight-for-height (wasting) and weight-for-age (underweight). Children were weighed using the UNICEF accredited lightweight, bathroom-type scales fitted with a digital screen, while their height was measured using measuring boards customised for use in survey settings. Children of ages below 24 months were measured lying down on the board (recumbent length), while standing height was recorded for those of ages 24 months and older. The unit of measurement for weight was in kilograms and for height/length was in centimetres (CBS, 1994, 1999, 2004; KNBS, 2010).

The three growth indices were used to assess children's nutritional status using the recommended WHO growth standards of 2006 (WHO, 2006). These growth standards provide a reference of child growth under optimal conditions using data collected across the world in the WHO Multicentre Growth Reference Study (de Onis et al., 2004). The indices were expressed in standard deviation units from the median of the study sample from the WHO Multicentre Growth Reference Study. It is important to note that the anthropometric measurements used in the study are those taken from the youngest child in the household whose mother was selected for the woman's questionnaire (the 'index' child, from whom all child data reported here were obtained).

2.2.1.1 Height-for-age index

The height-for-age index is an indicator of cumulative growth deficits with child linear growth in focus. A child with a height-for-age Z-score less than -2 SD from the median of the standard WHO child growth reference was considered to be short for its age and thus stunted. Stunting or chronic undernutrition reflects long-term child nutritional deprivation caused by inadequate feeding over a longer period of time and/or recurrent disease.

2.2.1.2 Weight-for-height index

Weight-for-height measures child's body mass in relation to body height/length and is an indicator of a child's current nutritional status. Children with weight-for-height Z-scores below -2 SD the median of the standard reference were considered too thin for their height or wasted. Wasting reflects acute undernutrition caused by short-term inadequate feeding and/or recent episode of illness.

2.2.1.3 Weight-for-age index

Children were classified as underweight if their weight-for-age Z-scores were less than -2 SD the median of the standard reference. Since weight-for-age index combines both height-for-age and weight-for-height indices, it does not differentiate between stunting and wasting. Consequently, children who are underweight can suffer from chronic undernutrition (short for their age) or acute undernutrition (thin for their height) or both.

2.2.2 Child care

The study used child feeding practices as indicators of care for children. Many other child care practices are relevant as discussed in previous sections, but due to the limited extent of DHS data, only feeding was in focus in this dissertation. The KDHS collected data on child feeding practices from mothers using the recall method. To assess these child feeding practices, the study used the WHO recommendations (WHO, 2010). Two core indicators (early initiation of breastfeeding and exclusive

breastfeeding) and two optional indicators (age-appropriate breastfeeding and bottle-feeding) were measured. Children of ages 0-23 months were considered to have been breastfed early if they were put to breast within one hour after birth. A 24 hour recall by mothers was used to determine whether exclusive breastfeeding was practiced between ages 0-5 months, complementary feeding and continued breastfeeding from 6-23 months and whether the index child was fed using a bottle with teat from ages 0-23 months. Exclusively breastfed children were defined as those who were fed on nothing else other than breast milk in the last 24 hours prior to the interview. Children were classified to be complementary fed and breastfed if they were given breast milk as well as any solid, semi-solid or soft foods in the last 24 hours. Those considered to be bottle-fed fulfilled the criteria that a bottle was used for at least part of their feeding in the last 24 hours prior to the survey.

2.2.3 Maternal resources

Maternal resources in terms of material assets were measured using quintiles of the household Wealth Index (WI), a proxy for standard of living based on household ownership of assets and housing quality. Each asset was assigned a factor score generated through principal component analysis, with the scores summed and standardized. The mother/child pair was then assigned the score and the quintile (poorest, poorer, middle, richer and richest) of their household (Rutstein & Johnson, 2004).

Self-reported maternal educational attainment was categorised as no education, incomplete primary, complete primary and incomplete secondary education. Due to sample size limitations in the 1993 survey for the higher education category, this dissertation combined mothers with complete secondary education and higher education. Maternal literacy levels were measured by testing mothers' ability to read a simple sentence shown on a card. Mothers were categorised as to whether they could read easily, with difficulty or could not read at all.

Maternal occupation, categorised into seven occupations by KDHS, was collapsed into three categories in order to overcome the low sample size in some of the original

categories. Mothers were thus categorised as either working in white-collar jobs, blue-collar jobs or not working.

Media exposure considered whether the mother read a newspaper/magazine, watched television, and/or listened to radio, using these response alternatives for three questions: Do you read/watch/listen every day, at least once a week, less than once a week or not at all?

2.2.4 Infrastructure resources

Child's place of delivery and mode of birth were the only two variables used as proxies for infrastructure resources available to the mother. Due to numerous places of delivery reported by mothers in KDHS, this study collapsed them into two categories of delivery: at a health facility or not. Mode of delivery was categorised as either caesarean or vaginal.

2.2.5 Context variables

During the 1993 and 1998 survey years, KDHS did not sample all the districts in Kenya. All the districts in North-Eastern province, Samburu and Turkana districts in Rift-Valley province, and Isiolo and Marsabit districts in Eastern province were not included due to practical limitations. Consequently, in this dissertation the North-Eastern province was excluded in order to allow comparison across all four surveys. Provinces included in the analysis are Nairobi, Central, Coast, Eastern, Nyanza, Rift-Valley and Western. Another geographical classification involved area of residence whereby households were categorised either to be in an urban or rural setting as defined by the government of Kenya.

Child's gender, age, size at birth, birth order and number of children aged less than five years in a household were considered contextual variables due to their effect on the type of care given to children. For example, existence of cultural differences may dictate how boys are cared for as compared to girls, younger children may be given more attention as compared to older ones, first-borns may be cared differently than fifth-borns, or the presence of many children under five years old in a household may

result in less time and resources available for any given child, and hence affect quality of care. Child's age was determined through use of birth cards and mother's report if the card was not available. Mother's assessment was used to determine child's size at birth and birth order. For trend analyses in Paper I and II, child's age was categorized as 0-5, 6-11, 12-23 and 24-35 months but was otherwise treated as a continuous variable. Child's size at birth was classified as either large, average or small.

2.3 Missing data

Missing values in DHS are defined as variables with no responses due to interview errors (Rutstein & Rojas, 2006). The DHS data processing team observes the rule that under no circumstance should an answer be made up, but instead a missing value is assigned. Nonetheless, special treatment is given to certain variables such as women's chronological events, where values are imputed for missing cases. There are also important background variables where missing cases are not accepted such as geographical variables (urban/rural and regions).

According to Tabachnick and Fidel (2007), the pattern of missing data is more important than the number of missing values. Data missing at random pose less serious problems while non-random missing values affect the generalizability of the results. An earlier rigorous missing cases analysis done on a host of DHS datasets across the world (Kenya included) showed that missing cases in these datasets were few and missing primarily at random (Pullum, 2008). In this dissertation, data that were missing in the DHS datasets were treated as missing in the analyses. No imputation was practiced. This study used pairwise deletion during analysis whereby cases were excluded only if they had missing cases on variables involved in a particular analysis. Furthermore, in very few circumstances where missing cases in a variable were considered high, the study did not include such a variable in the analysis.

2.4 Statistical analysis

All analyses in this dissertation were conducted using Statistical Package for Social Sciences (SPSS) version 19. Due to the multi-stage sampling criteria by KDHS, the design effect parameters 'sampling weight', 'sample domain' and 'sample cluster' were incorporated in all analyses using SPSS' Complex Samples Module. Logistic regression was used in data analysis in all the three Papers.

2.4.1 Logistic regression

Logistic regression is a form of regression that allows testing of models to predict categorical outcomes with two or more categories. The predictor variables' level of measurement can either be continuous, categorical or both in one model (Tabachnick & Fidell, 2007). Since outcome variables in the study were binary variables (for example, not stunted/stunted coded as 0 and 1), the assumption was that the mean of these values in a sample was the same as the proportion of individuals with the characteristic. It was hence expected that a logistic regression model would predict the proportion of subjects with the feature of interest or the probability of an individual having that characteristic for any combination of predictor variables in the model. A logit transformation was used to predict probabilities within the range of zero to one summarised with the equation:

$$\text{logit}(p) = \log_e(p/1- p)$$

Where p is the probability of a respondent having a characteristic, 1- p is the probability that she/he does not have the characteristic and the ratio p/(1- p) is the odds or log odds (Altman, 1990; Tabachnick & Fidell, 2007).

2.4.2 Trend estimation

Logistic regression was used to test for linear trends (slope) in the prevalence of undernutrition (Paper I) and feeding practices (Paper II). This involved modelling change in prevalence regressed on time (four survey years for Paper I and three survey years for Paper II). The regression equation:

$\log(p/1-p) = \beta 0 + \beta$ survey year • survey year

was used to test the significance of the slope (the null hypothesis was that the regression coefficient β for survey year was not significantly different from zero). Probability values for Wald F tests less than 0.05 was considered significant.

2.4.3 Associations between feeding practices and predictor variables

In Paper II, associations between feeding practices and socio-demographic variables using the 2008-09 survey started by first conducting bivariate analyses. Chi-square or Student's t-test were evaluated depending on a variable's level of measurement. Logistic regression was then used to undertake multivariate analysis including socio-demographic variables that had significant bivariate associations ($p < 0.05$) with the feeding variables. Odds ratios (OR) and 95% confidence intervals (CI) were calculated.

In Paper III, logistic regression was also used but the difference from Paper II was the hierarchical manner in which the variables were entered in the regression models, as suggested by Victora et al. (1997). The investigation was organised with attention to possible predictor variables at three levels. Variables at the distal level (urban/rural living conditions and province of residence) were entered first followed by intermediate level variables represented by several classical measures such as household wealth and maternal education. The proximal level variables focussing on intra-household and community factors that may affect a mother's/family's ability to provide care to their child (early initiation of breastfeeding) were entered last. The first level of analysis examined the unadjusted associations of the distal variables while the level two analysis examined the associations of intermediate variables adjusted for the possible confounding role of distal variables. Analysis at level three examined the associations of proximal care determinants adjusted for the confounding roles of distal and intermediate variables. Wald F tests and Odds ratios with 95% CI were used to evaluate the significance of the associations.

2.4.4 Replication analysis

Replication analyses are undertaken to confirm the robustness of the relationships in statistical models, often developed with one set of data and tested on other sets of data. The retesting of an original model with other datasets is generally referred to in survey research as retest replication, and the aim is to repeat an original study with slight if any significant changes in the research design (La Sorte, 1972). According to Lindsay and Ehrenberg's theory of replication (Lindsay & Ehrenberg, 1993), there are two replication analyses that can be undertaken; a 'close replication', which assumes limited changes in the design, and a 'differentiated replication' that is flexible as it extends the range of conditions being studied. Tsang and Kwan's (1999) approach to replication analysis referred to as 'empirical generalization' emphasises the use of the same measurement and analysis with data from different populations. It is possible to also undertake a replication analysis using only one sample. This entails cross-validation, whereby jack-knife and bootstrap methods are used to examine replicability (Thompson, 1994).

There are a number of strategies that can be employed when undertaking a replication analysis. These strategies are: replication of methodology, and/or of analyses, and/or of statistical models. As examples, replication of methodology has been used by Graves (1978) to compare the relationship between infant nutrition and behaviour in Nepal with findings from West Bengal as a reference. In relation to the replication strategy that involves analyses and statistical models, Miller et al. (2001) investigated the replicability of regression models by relating caregiver distress to social support and stressors using four data sets. Miller et al. (2001) performed four analyses independently within data sets, and then compared results across the data sets to check for consistency.

The replication analysis undertaken in this dissertation in Paper III examined the reliability of demographic and socio-economic variables in predicting early initiation of breastfeeding, by comparing analyses of three highly similar, yet independent data sets from 1998, 2003 and 2008-09.The starting point was to select all children ages 0-

23 months in the 2008-09 data (n = 2,125), the survey in which the fewest children participated. Same-sized samples of children were then selected at random from the 1998 and 2003 data sets using the SPSS random selection procedure. Logistic regression was then used to conduct multivariate analyses independently for each survey year. The reliability of socio-demographic variables was assessed based on the replicability of significant variables across the three surveys.

2.5 Ethical considerations

The study used secondary data collected by the Kenya National Bureau of Statistics with technical assistance from Macro Inc. The scientific and ethical review committee of the Kenya Medical and Research Institute approved the KDHS study protocols (CBS, 1994, 1999, 2004; KNBS, 2010). The datasets are publically accessible through application to MEASURE DHS and require no further ethical clearance (ICF International, 2014).

Even though the KDHS team took measures to address ethical issues by seeking approval of the study protocols as just mentioned, there are ethical issues encountered during data collection, and after, that deserve critical reflection.

At the start of data collection, the KDHS field teams introduced themselves to possible respondents as officials working with the Kenya National Bureau of Statistics, explaining that the information given by the respondent would be important in aiding the government in planning health services (CBS, 1994, 1999, 2004; KNBS, 2010). This introduction may induce response acquiescence. As evidenced by the very high reported response rates, it is possible that the mention of "government" exerted authority that limited respondents' perceived right of voluntary participation. Also possibly troublesome is the assertion that the information given would help the government plan health services. The respondents might believe that there were some health-related benefits tied to respondent's participation, and thus anticipated benefits could motivate participation (and also possibly influence the answers given by the respondents).

Closely related to respondents' expectations is the ethical concern relating to the principle of beneficence and healthcare provision. While it is clear that the provision of healthcare falls under the ethical obligation of health practice, ethical problems arise when surveys such as the KDHS deal with monitoring the health of the poor, whose poverty may increase the likelihood of ill health (Carrel & Rennie, 2008). For example, what is the ethical responsibility of KDHS when they encounter children with health complications following from severe under-nutrition? Do they just measure the child's anthropometric measurements and leave? An investigation of DHS documents does not reveal answers. However, even if medical care had been provided to needy individuals, this could lead to a further ethical dilemma. Being selected for the survey could provide a benefit not available to other needy persons who are not selected for the survey.

The principle of justice emphasizes fair considerations at the individual and social level. It outlines that fairness should be exercised in research so that potentially beneficial research does not discriminate at an individual or societal level (Shore, 2006). In surveys conducted before 2003, the KDHS team did not include North-Eastern province and some parts of Eastern and Rift-Valley provinces in its study sample (CBS, 1994, 1999). The reasons given for excluding these areas related to "logistical" concerns. Such reasons do not guarantee justice to Kenyans living in those areas given the high likelihood of marginalization of these insecure and logistically challenging areas.

In survey research, it is an ethical requirement that survey participation should involve minimum disruption to respondents and participation should not require respondents to retrieve extensive records or background materials (Gideon, 2012). The DHS questionnaires are not only lengthy but also cover extensive aspects concerning the respondent's background (see appendix). Even though the respondent consents before the start of the interview, it is probable that the length and content of the questionnaire infringes on the respondent's time and privacy to a degree that a respondent could not have anticipated beforehand. However, having agreed to start an

interview, it could be very difficult to cease participation during the interview process, should a participant feel motivated to do so.

Just like all other research surveys, the DHS employs strategies to ensure a high response rate. One of the strategies is to follow up on non-respondents. While this strategy helps ensure more complete coverage of hard to reach respondents, it raises the ethical question of whether such call-back attempts should be made when cooperation is supposed to be completely voluntary. Research on the effect of responses from converted respondents in making conclusions about the studied population shows minimal bias with regard to findings, but this is quite separate from the issue of possible feelings of coercion to participate (Olson, 2006; Retzer, Schipani, & Cho, 2004).

Another ethical consideration relates to utilization of survey findings (Fabic et al., 2012; Murray, Lopez, & Wibulpolprasert, 2004). Reports that summarize DHS findings are often cited in government publications and scientific publications, but it is unknown the degree to which governments use such publications to inform policy (Murray et al., 2004).

3. RESULTS

3.1 Paper I

The aim of the study reported in Paper I was to describe time trends in child under-nutrition in Kenya from 1993 through 2009. The study used the 2006 WHO child growth standards (WHO, 2006) to describe trends in stunting, wasting and underweight with overall trends decomposed by age, province, urban/rural residence, maternal education level and Wealth Index, for boys and girls separately. Children aged between 0-35 months with their mothers of ages 15-49 years were included in the analysis. The unweighted sample size distribution as per the four surveys was 3,370 mother-child pairs in 1993, 3,275 pairs in 1998, 3,045 pairs in 2003 and 3,120 pairs in 2008-09.

The national trends in childhood undernutrition in Kenya showed significant declines in underweight, but trends in wasting and stunting were stagnant. Analyses disaggregated by demographic and socio-economic segments revealed some departures from the overall trends. There were more declines in wasting among girls than boys in the various socio-demographic stratifications studied, and the opposite was true for stunting, with boys posting more declining trends compared to girls. The results in Paper I generally showed that faltering child growth, especially stunting, remains a significant public health challenge in Kenya.

3.2 Paper II

The analyses in Paper II were informed by the fact that causes of child under-nutrition have roots in a society's political, social and economic structure and functioning, which in turn affect household resources and child care in a causal chain as illustrated in the conceptual framework guiding this study in Figure 1. Because child under-nutrition was stagnant or even worsened in certain groups as revealed by results in Paper I, the postulate for Paper II was that some of the underlying causal factors (child care practices) are also stagnant or worsening, despite the efforts of

society to reduce child undernutrition. Consequently, the study aims for Paper II were to examine trends in early initiation of breastfeeding at age 0-23 months, exclusive breastfeeding at 0-5 months, complementary feeding and breastfeeding at 6-23 months and bottle-feeding at 0-23 months, using measures and definitions recommended by the WHO (WHO, 2010). The trends estimations were disaggregated by child's sex and age, province, residence, maternal education, household wealth, maternal literacy and media exposure using data collected in 1998, 2003 and 2008-09. The second aim was to examine multivariate relationships between socio-demographic factors and feeding practices with data from 2008-09, the most recent available data. The data used were obtained from one mother in each household and her youngest child, including only pairs in which the child's age was 0-23 months. The unweighted sample sizes are 2,235 mother-child pairs in 1998, 2,141 pairs in 2003 and 2,125 pairs in 2008-09.

To summarize the main results, the trends in exclusive breastfeeding showed mostly significant improvement (increased), although the starting point in 1998 was low, ranging from 13 to 21 percent in the various socio-demographic groups studied. The most dramatic improvement was for children in the poorest wealth quintile, with exclusive breastfeeding tripling to 54 percent in 2008-09. Conversely, the trends in early initiation of breastfeeding, complementary feeding and breastfeeding, and bottle-feeding were stagnant or slightly worsened in most of the socio-demographic groups studied. Logistic regression models using the 2008-09 data showed that accounting for other variables, the province where the mother resided was the most significant predictor of early initiation of breastfeeding, exclusive breastfeeding and bottle-feeding.

3.3 Paper III

Analyses in Paper III focussed on early initiation of breastfeeding (within one hour after birth) as the outcome variable, and assessed the reliability of socio-demographic variables in predicting early initiation of breastfeeding, by comparing analyses of three highly similar, yet independent data sets from 1998, 2003 and 2008-09. To

enable comparability, the study used the same predictor variables and the same sample size of children ages 0-23 months (n = 2,125) from each of the three surveys.

The main finding was that significant predictor variables produced using the 1998 data were poorly replicated using the 2003 and 2008-09 data. Only mode of birth and province of residence reliably predicted early initiation of breastfeeding across the three surveys. Children delivered through caesarean section (compared to vaginal birth), and those living in Western and Coast provinces (compared to Eastern province), were at a higher risk of being breastfed later than an hour after birth across all three surveys.

4. DISCUSSION

The main findings related to each study objective were as follows:

Study objective I: To describe sub-group trends in stunting, wasting and underweight in Kenya from 1993 to 2008-09 using the 2006 WHO child growth standards.

> **Main finding:** The national trends in childhood undernutrition in Kenya showed significant declines in underweight, but trends in wasting and stunting were stagnant. Analyses disaggregated by demographic and socio-economic segments revealed declines in wasting in most segments among girls than boys, and the opposite was true for stunting, with declines in most segments among boys than girls.

Study objective II: To describe sub-group trends in early initiation of breastfeeding at 0-23 months of age, exclusive breastfeeding at 0-5 months of age, complementary feeding and breastfeeding at 6-23 months of age, and bottle-feeding at 0-23 months of age using measures and definitions recommended by WHO.

> **Main finding:** Trends in exclusive breastfeeding showed mostly significant improvement. In contrast, trends in early initiation of breastfeeding, complementary feeding and breastfeeding, and bottle-feeding were stagnant or slightly worsened in most of the socio-demographic groups studied.

Study objective III: To examine multivariate relationships between socio-demographic factors and feeding practices with data from 2008-09, the most recent available data.

> **Main finding:** The province of residence significantly predicted early initiation of breastfeeding, exclusive breastfeeding and bottle-feeding.

Study objective IV: To examine the reliability of socio-demographic variables in predicting initiation of breastfeeding within an hour of birth, using data from 1998, 2003 and 2008-09.

> **Main finding:** Significant socio-demographic variables in predicting early initiation of breastfeeding produced using the 1998 data were poorly replicated using the 2003 and 2008-09 data.

This chapter discusses these findings by first highlighting some methodological considerations followed by discussion of the findings in Papers I, II and III in a coalesced approach. Priority has been given to issues that were either not covered or received less attention in the three peer-reviewed articles.

4.1 Discussion of methodology

4.1.1 Sources of data

The study used survey data (KDHS) collected on various health indicators with the aim of generating data relevant to health planning, implementation, monitoring and evaluation of health programmes (CBS, 1994, 1999, 2004; KNBS, 2010). It is therefore imperative to reflect on the possibilities and limitation of usage of these data sets in answering the research questions of this dissertation. The KDHS, just like other DHS surveys, are complex surveys that use standard questionnaires translated to different languages, with respondents cutting across varying socio-economic and demographic stratifications. This degree of complexity presents a challenge to the quality of the data collected. In discussing the quality of the datasets, we will consider five aspects of survey research quality, namely: specification, coverage, sampling, response, and measurement (Bowling, 2005; de Leeuw & Dillman, 2008; Groves, 2004).

4.1.1.1 Specification

Specification error in survey methodology occurs when the question administered to a respondent fails to capture what is essential for the research. This leads to low

construct validity whereby the construct implied in the survey question differs from the intended construct that should be measured (de Leeuw & Dillman, 2008). Specification errors in KDHS were minimised by first ensuring that the questions in the questionnaire reflected the study objectives. In addition, the KDHS used the standard questionnaire developed for all countries participating in the MEASURE DHS programme to enhance uniformity in the study objectives and question structuring. Nonetheless, slight modifications are made to the questions in specific countries to ensure that the questions are locally relevant, but such modifications are limited to ensure comparability, limit complexity of the survey and keep the length of the questionnaire within limits (Boerma & Sommerfelt, 1992). Pretesting of the concept questionnaire in various districts that would later participate in the real survey is also done to minimize specification errors (CBS, 1994, 1999, 2004; KNBS, 2010). Since this study used datasets from different survey periods, a deliberate effort was made to ensure that there was consistency across survey years in the variables used in the analysis. Specification errors are thus not likely to be of substantial significance in the interpretation of results of this study.

4.1.1.2 Coverage

The quality of survey data can also be affected by coverage errors that occur when some members of the population are excluded systematically from the study sampling frame (de Leeuw & Dillman, 2008; Groves, 2004). Due to logistic and infrastructural challenges such as poor road network, the KDHS surveys carried out in 1993 and 1998 excluded the North-Eastern province and some districts in the Eastern and Rift-Valley provinces from the sample frame (CBS, 1994, 1999). This exclusion results in a major source of coverage error for this study. Even though the excluded areas were sparsely populated and accounted for less than four per cent of the national population, coverage errors need to be considered in the interpretation of results in this dissertation. Since not every member of the national population had a known and nonzero chance of being selected into the survey, and the potential for the health marginalization of people in the excluded areas may be significant, it is possible that the coverage selection effect just described may have biased the study. Caution

should therefore be exercised in the interpretation of aggregate results in this dissertation, that is to say the results at the national level. The national level estimates of undernutrition and sub-optimal feeding are likely too low. However, it has been a clear intention of this dissertation to avoid a focus on national level findings, and the many drawbacks of taking a national level perspective on child health is discussed at length in the introductory sections of this dissertation.

4.1.1.3 Sampling

Sampling errors arise when a subset of people in the population is surveyed rather than the entire population (de Leeuw & Dillman, 2008). As a consequence, the derived estimates from such a subset will not be identical to the actual values (Groves, 2004). The sampled respondents in the KDHS represent only one of an infinite number of samples that could have been selected from the study population using the same sampling design. The resulting sampling error refers to the variability between all possible samples from the actual sample selected. When simple random sampling is used, sampling errors can be evaluated statistically by standard statistical techniques. However, the KDHS used a two-stage stratified sampling design and therefore requires complicated statistical techniques to calculate sampling errors. The KDHS used the Integrated System for Survey Analysis (ISSA) software to calculate sampling error for the four surveys used in this study. An evaluation of sampling error from the four surveys showed that due to the multi-stage sampling design, the average standard error increased by a factor of 1.30 in 1993, 1.26 in 1998, 1.78 in 2003, and 1.83 in 2008-09, over that in an equivalent simple random sample (CBS, 1994, 1999, 2004; KNBS, 2010). Generally, the relative standard error for most indicators for the country as a whole is small except for indicators with limited sample size, and differences exist in the relative standard error for indicators by sub-populations. This has implications for this study, given that its analytical approach involved stratification of the samples. The results for stratified groups with limited sample size should thus be interpreted with caution, as they are likely to be affected by sampling errors.

4.1.1.4 Non-Response

The quality of KDHS data in relation to response rate may be evaluated by examining the non-response errors. Non-response errors occur when some of the sampled respondents do not respond at all, or fail to answer certain survey questions (Assael & Keon, 1982). The KDHS took considerable measures to reduce non-response errors, such as paying several visits to households with absent respondents to ensure high response rates. In fact, the response rates in the four surveys were over 94 percent, and non-response was mostly due to failure to find individuals at home despite repeated follow-ups by the interviewers (CBS, 1994, 1999, 2004; KNBS, 2010). The non-response rates are very low compared with typical survey research non-response rates, and it is presumed that non-respondents are not different from those who responded (Bowling, 2005). Issues of non-response errors are therefore less likely than the other types of survey errors to affect the conclusions of this study.

4.1.1.5 Measurement

Measurement errors occur when a respondent's answer to a question is inaccurate and thus do not reflect the 'true' value, or when measurements made by survey staff during data collection are faulty or wrongly recorded (de Leeuw & Dillman, 2008; Groves, 1987). To try to reduce measurement error, the KDHS questionnaires are clearly worded and adapted to the local context after consultations with relevant stakeholders. Additionally, the questionnaires are tailored to target three separate groups (the household as a whole, the women and the men). This ensures that the respondents are asked questions that they are likely capable of providing answers to, and flexible interviewing is practiced to try to ensure respondents understand the questions as intended. This form of interviewing has been shown to increase accuracy of responses (Schober & Conrad, 1997). The interviewers are also thoroughly trained on interview techniques and it seems they are well supervised. Nevertheless, measurement errors are inevitable and there is no way to estimate their magnitude, except in studies designed specifically for that purpose. As the ascertainment of measurement error in DHS surveys has not been an aim of the DHS programme, the

magnitude of such error and its effect on the findings of this dissertation are unknown.

4.1.2 Sample size and logistic regression

Analyses presented in the three Papers of this study were conducted using logistic regression. Logistic regression is a robust method of analysis and more flexible than other techniques such as discriminant analysis that could be an alternative analytical technique. As noted by Tabachnick and Fidel (2007), logistic regression requires no assumptions about the distributions of the independent variables (they do not need to be normally distributed), neither do independent variables need to be linearly related nor of equal variance within each group. Even though such flexibility makes logistic regression an attractive analytical technique, the issue of sample size remains quite pertinent (Bewick, Cheek, & Ball, 2005; Nemes, Jonasson, Genell, & Steineck, 2009). Just like in other statistical techniques, the statistical power of the analysis increases with sample size (the higher the power of a test the greater the probability that it correctly rejects the null hypothesis). Logistic regression requires large samples in both categories of the response variable and larger sample size is required if the analysis has many explanatory variables. However, the concept 'large sample size' is imprecise, and what is deemed large enough is determined by the research context and by practical realities. A test of power sufficiency is nevertheless available; the Hosmer-Lemeshow goodness of fit test for use in logistic regression, which was used in this research, can indicate low power and the resultant unlikelihood of detecting deviations from the logistic model (Bewick et al., 2005). Limited sample size also makes logistic regression technique susceptible to bias in its derived odds ratios. It overestimates odds ratios with small sample size and the induced bias is a systematic one (Nemes et al., 2009).

It is thus important that the issue of sample size in all three Papers be put into reflection when interpreting the results. In relation to the issue of sample size and the effects that varying sample sizes have on statistical tests of linear trends as reported in Papers I and II, the sensitivity of statistical testing to sample size is such that two

trends based on identical prevalence estimates may be statistically significant in the one case and not in the other. Caution should therefore be exercised in cases of limited sample size. With regard to sub-group sample sizes in predictor variables reported in Papers II and III, the confidence in the odds ratios should be evaluated using the calculated confidence intervals as advised by Tabachnick & Fidell (2007). The take home message on sample size in relation to the method of data analysis used in this study is that the results presented are influenced by the varying sample sizes from test to test. There is potential for bias in estimates especially for sub-group analyses with limited sample size.

4.1.3 Maternal self-report and recall

Apart from anthropometric measurements, vaccination history and HIV testing, the majority of information in DHS is collected through recall of events, which is vulnerable to recall bias (Boerma & Sommerfelt, 1992). The DHS takes considerable measures to ensure that the information collected reduces such bias. For example, it uses a 24 hour recall period to assess child feeding practices, rather than the seven-day recall period that provides more data but also more room for recall errors. Other recall measurements are more problematic, especially measurement of events that require longer duration of recall, such as recall of the time when the child was breastfed after birth for a two year old. Literature on maternal recall as a method of data collection on child feeding shows that it is a reasonably valid method for breastfeeding practices (Boerma & Sommerfelt, 1992; Launer et al., 1992; Li, Scanlon, & Serdula, 2005; Troy et al., 1996). However, the many questions asked on the number of foods fed to the child in DHS surveys render maternal recall about child diet cumbersome and prone to recall bias (Boerma & Sommerfelt, 1992). Studies on the validity of maternal recall in relation to non-breast food and liquids show mixed results (Friedenreich, Howe, & Miller, 1991; Launer et al., 1992; Li et al., 2005). This study assumes that the use of maternal reports as a method of data collection is a sufficiently reliable method given the inherent limitations of survey research (Clarke, Fiebig, & Gerdtham, 2008; Coughlin, 1990; Krall, Dwyer, & Ann

Coleman, 1988; Manesh, Sheldon, Pickett, & Carr-Hill, 2008; Yawn, Suman, & Jacobsen, 1998).

4.2 Discussion of results

4.2.1 Sex differences in child physical growth and care practices

Results in Papers I and II showed stagnating trends overall in child growth and feeding practices in Kenya, but also important departures in the sub-group analyses. Consistent with previous studies from sub-Saharan Africa, child growth patterns showed slightly lower prevalence in wasting, stunting and underweight for girls as compared to boys (Medhin et al., 2010; Sahn & Stifel, 2002; Svedberg, 1990; Wamani et al., 2007).

There have been no conclusive explanations as to why male children suffer higher prevalence in wasting, stunting and underweight as compared to girls. Results from studies that have investigated sex bias in sub-Saharan Africa are contradictory (Svedberg, 1990). The question then is: what are the possible explanations for child physical growth sex differentials? To begin with, we explore the possibility of sex biases in feeding or care practices during childhood. Marcoux's (2002) review of studies on sex differentials in undernutrition reported that in cases where sex biases exist, boys were likely to fare worse than girls as per anthropometric indicators. Nonetheless, he cautions against making firm conclusions about sex bias in intra-household food allocation based on small-scale studies. The explanation is that even though discrimination by sex may exist in relation to child feeding practices or other child care practices, evidence from the small-scale studies was either not generalizable, or the size of sex differences were relatively modest. Marcoux concludes that the pattern of higher undernutrition prevalence in boys as compared to girls could lie in the physiological differences between the two sexes. Due to the comparatively higher body development energy requirement of male children, they may be more likely to suffer growth deficits than females, given food supply challenges and even-handed feeding home regimes (Marcoux, 2002).

Sex differentials in child physical growth have also been linked to morbidity and mortality with males reported to be more vulnerable than females (Stinson, 1985; Wells, 2000). It has been argued that environmental conditions have favoured the female sex as evidenced from the sex ratio of live births, and the reported high vulnerability to diseases experienced by males (Wells, 2000). Underlying vulnerability of the male sex to disease is heightened by undernutrition, which interacts with infection to cause retarded growth. The underlying argument is that environmental stress during the early stages of life will always affect males more severely than females (Hoyenga & Hoyenga, 1982; Stinson, 1985; Wells, 2000).

It is perplexing to observe, as this study has, that girls' trends in wasting declined (improved) more compared to boys, and that boys' trends in stunting declined more compared to girls. As just discussed, evidence on gender bias in feeding and/or care practices is not convincing. This calls for further research on this issue. Perhaps a more detailed analysis would be enlightening, of the socio-demographic and infrastructural changes related to male-female child growth dynamics at both proximal and distal levels of influence.

4.2.2 Age differences in child physical growth and care practices

Other important findings on trends in child physical growth and feeding practices were the differences by age. There was a consistently low prevalence and stable trend in wasting and stunting among youngest children aged 0-5 months from 1993 to 2009. There could be many explanations for this good growth pattern, among which is a population-level protective effect of the improvement in Kenya in the study period in child care and feeding practice at this age. Trends in exclusive breastfeeding from 0-5 months showed mostly significant improvement in the various socio-demographic groups studied. Evidence on the importance of exclusive breastfeeding on child growth shows that infants who are exclusively breastfed experience less morbidity resulting from gastrointestinal infection and thus have better growth patterns than those who are mixed breastfed (Bhandari et al., 2003; Kramer et al., 2003; Kramer & Kakuma, 2007). Even though this study did not statistically analyse

the relationship between improvements in child physical growth and exclusive breastfeeding for children aged 0-5 months, the observed patterns could point to the success of breastfeeding health education efforts and campaigns in Kenya.[1]

4.2.3 Differences in child physical growth and care practices by province

Consistent in the three Papers, trends in child growth and care practices differed by province of residence. For example, while trends in wasting and stunting remained stable in most provinces, it declined in Nyanza and Eastern provinces. Trends in early initiation of breastfeeding declined in Central and Western provinces while bottle-feeding trends declined in Coast, Eastern and Rift-Valley provinces. The multivariate analyses in Papers II and III on feeding practices showed that province had a consistent association with child feeding practices, even after other variables were taken into account.

Various possible explanations about these provincial differences in growth and feeding practices have been discussed in the three Papers. Here, we highlight the importance of province as a contextual/distal factor capable of influencing child physical growth and feeding practices as Figure 1 illustrates. Engle et al. (1997) highlighted that child care (which has enormous impact on child growth) depends to a degree on the availability of resources and support at community, regional and national levels. This brings to the fore possible differences in provincial/regional infrastructure, economy and culture, and how such differences might impact care practices (Corsi et al., 2011).

Cultural variation is likely to have more impact on care practices than on nutritional status (Engle et al., 1997). This is because child care practices are behaviours that can be acquired informally depending on the existing cultural setting (Morales, Aguilar,

[1] That this research did not include a joint analysis of growth and feeding resulted from the decision that the cross-sectional nature of the data at the child level, and therefore the cross-sectional nature of any such analysis, would faultily ignore the time factor in the relationship between feeding and growth, and fail to untangle the reciprocal relationship between feeding and growth.

& Calzadilla, 2004). It is also evident that there exists a myriad of cultural differences in feeding practices in Kenya both by province and by the different ethnic groups (Government of Kenya, 2011; Watson, 2013). For example, research shows that women in Kenya are generally aware of the benefits of breastfeeding, but have to cope with maternal workload often including employment outside the home, family demands, cultural beliefs about when and what to feed their children, worries about breastfeeding's effects on a woman's physical appearance, stigma associating exclusive breastfeeding with the prevention of HIV transmission, and lack of social support for optimal breastfeeding practices (Government of Kenya, 2011). Some of these challenges cut across provinces but others have been observed to be specific to certain provinces. For example, in Nairobi province, lack of social support was mentioned as a major hindrance; in the Western province, cultural beliefs were cited; in the Rift Valley province, environmental factors such as droughts were mentioned; in the Nyanza province, household conflicts that resulted to violence against women was quoted as a challenge; in the Eastern province, beliefs in maternal promiscuity and the mother's age posed a challenge; in the Coast province the numerous social responsibilities placed on women and low literacy levels were a challenge; and lastly a spill-over effect of HIV and religious beliefs were cited in the Central province as a challenge to optimal child care (Government of Kenya, 2011).

Given that children's basic needs for food, health care, protection, shelter, and love are universal across cultures, but that differences arise from how each culture and each family within that culture attempts to meet these needs (Engle et al., 1999), it is reasonable that interventions meant to improve child growth consider the cultural differences in Kenya. This may involve tailoring such programmes to the local settings reflecting the everyday contexts that organize the lives of children and their caregivers. Also important would be an understanding of the norms, values and other local behaviours and how they influence the use of resources that promote child growth and wellbeing (Weisner, 2014). This is not to infer that culture trumps all other factors that are likely to influence child growth and care practices. Other factors that have not been investigated in this dissertation such as governmental policies,

political activities, and the ecological environment in the different provinces that can influence care practices.

The summary conclusion is that province of residence should be taken to include many unmeasured factors that vary more or less systematically from province to province. The province-level differences in growth and care practices observed in this study suggest strongly that besides survey research like the KDHS, other types of research inquiry are needed, that have the potential to penetrate the myriad of growth and care-relevant contextual factors implied by the provincial differences observed. Further analysis of the relatively limited data in the KDHS would be inadequate in this regard.

4.3 Strengths and limitations

Strengths and limitations have been addressed or at least acknowledged in the three papers and in some previous sections of the Summary. Here, some of the most important issues, but certainly not all issues are highlighted. The major strength of this dissertation is the use of nationally representative datasets to study child physical growth and care practices. These datasets are based on large household samples that provide important information on population, health, and nutrition. The multistage probabilistic sampling procedure adopted by DHS makes it possible to undertake analyses at detailed levels that aid understanding of health outcomes at the individual and population levels (Corsi et al., 2011; Corsi, Neuman, Finlay, & Subramanian, 2012). The findings in this dissertation thus offer nationwide estimates of Kenya's child physical growth and care practices.

The use of the internationally recommended WHO child growth reference standards in studying trends in child growth is another strength of this study (WHO, 2006). Earlier growth estimations before 2006 used the out-dated growth reference standards defined by the U.S. National Center for Health Statistics. The study also used the recommended child optimal feeding practices (WHO, UNICEF, 2003).

Another strength of the dissertation is the study of child physical growth and care practices over time. The cross-sectional surveys collected repeatedly every five years by DHS enables analysis of the changes in population health and progress in the implementation of various health interventions over time (Jones-Smith, Gordon-Larsen, Siddiqi, & Popkin, 2011; Subramanyam, Kawachi, Berkman, & Subramanian, 2010; Waters, Saadah, Surbakti, & Heywood, 2004). Trend analyses presented in this dissertation offer valuable information that can be used to inform policy and future planning of interventions to improve child physical growth and enhance optimal child feeding practices in Kenya.

Turning to study limitations, the first limitation relates to the stratification approach used to study trends in child physical growth and care practices. While stratifying samples enabled detailed understanding of trends within the different socio-economic and demographic groups, it resulted in reduction in sample sizes. This in turn resulted in wider confidence intervals around the estimations. It is therefore important to be cautious in interpreting results in this study where certain groups had limitations in sample size.

Another limitation relates to the few data points (survey years) used to study trends. The four survey years used in Paper I and three survey years used in Paper II do not give a conclusive picture of trends. More data points with less inter-survey time period are needed to better understand trends in child physical growth and care practices (Rudan et al., 2005). The choice, then, was to undertake no trend analyses at all, or to undertake trend analyses with admittedly too few data points; the choice was to proceed, and exercise caution in coming to conclusions.

The failure of the KDHS to measure adequately some socio-demographic, socio-psychological, cultural and political variables known to have an association with child care practices is a notable limitation of the study. For example, variables such as antenatal visits and the type of birth attendant were not included in the regression equation in Paper III due to the missing cases in one of the surveys, while the socio-psychological, cultural and political variables are not included in DHS at all. This is a

common limitation of large-scale surveys like the KDHS, which are meant to scan public health conditions and not provide in-depth data on health and disease processes.

5. CONCLUSIONS

Results from descriptive analyses of trends in child physical growth and care practices suggest that more concerted efforts are needed in reducing child undernutrition and advocating for optimal child feeding practices in Kenya. Programmes and interventions directed towards combatting undernutrition and improving child care practices need to be scaled up with special attention to the provincial/regional differences observed. There is need to reverse the poor patterns of optimal child feeding practices experienced in the various provinces, such as late initiation of breastfeeding in Western and Coast provinces, early introduction of food to children before six months of age in Coast and Nairobi provinces, and bottle-feeding practices in Nairobi province.

Despite the low prevalence in exclusive breastfeeding, the improvement in exclusive breastfeeding over the study period is a testimony that it is possible to promote optimal child feeding practices. Similar energy should be directed towards advocating for initiation of breastfeeding within an hour of birth, complementary feeding and continued breastfeeding after six months to two years and beyond, and avoidance of bottle-feeding.

The reliability analyses call for caution in coming to firm conclusions about relationships of behavioural outcomes and socio-economic and demographic variables in large-scale surveys. This does not imply that the data in large-scale surveys is of poor quality, but rather the inability of these socio-economic and demographic variables, presented as gross proxy measures such as province/region of residence and urban/rural location, to unearth the underlying complexity connecting all the relevant elements as shown in Figure 1 and illuminated in the earliest sections of this summary.

Descriptive analyses of trends in stunting and wasting showed differing trends between boys and girls. In contrast, multivariate analyses on child care practices showed no significant sex differences. These two findings call for further detailed

analyses and perhaps for research with qualitative designs. As highlighted in the discussion of results, sex differences are difficult to detect in survey research and recommendations are made against using large-scale survey study design in the search for factors underlying sex differences (Marcoux, 2002). This points to an interesting area for further research, possibly mixed methods studies of cohorts, and of cases and controls to clarify this issue of sex differences in growth and care practices in Kenya.

Results on child physical growth showed that faltering child growth remains a significant public health challenge in Kenya. The scope of this study did not undertake an analysis of causes of faltering growth in the Kenyan context. There is need for national research that goes beyond the simple descriptive analyses presented here. Literature shows declining agricultural performance and food distribution at a macro level, and micronutrient deficiency at the level of individuals (Bwibo & Neumann, 2003; Government of Kenya & Kenya National Bureau of Statistics, 2009; KIPPRA, 2009; UNICEF & Government of Kenya, 2009). This span from macro to micro level illustrates the complexity of the web that underlies faltering child growth and a potential area for further research.

The results of this study showed that child growth and care practices differed by province of residence. This prompted speculation that culture could be an underlying factor dictating the care children receive in the different provinces. There is need for further research to aid better understanding of how local contexts influence child care and feeding practices. Large-scale survey research is certainly desirable, to continue to monitor national and regional trends, but it should be complemented with small scale qualitative and mixed-methods research to aid formulation of better interventions that are responsive to local living conditions and culture.

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RESEARCH ARTICLE Open Access

Child undernutrition in Kenya: trend analyses from 1993 to 2008–09

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Abstract

Background: Research on trends in child undernutrition in Kenya has been hindered by the challenges of changing criteria for classifying undernutrition, and an emphasis in the literature on international comparisons of countries' situations. There has been little attention to within-country trend analyses. This paper presents child undernutrition trend analyses from 1993 to 2008–09, using the 2006 WHO criteria for undernutrition. The analyses are decomposed by child's sex and age, and by maternal education level, household Wealth Index, and province, to reveal any departures from the overall national trends.

Methods: The study uses the Kenya Demographic and Health Survey data collected from women aged 15–49 years and children aged 0–35 months in 1993, 1998, 2003 and 2008–09. Logistic regression was used to test trends.

Results: The prevalence of wasting for boys and girls combined remained stable at the national level but declined significantly among girls aged 0–35 months ($p < 0.05$). While stunting prevalence remained stagnant generally, the trend for boys aged 0–35 months significantly decreased and that for girls aged 12–23 months significantly increased ($p < 0.05$). The pattern for underweight in most socio-demographic groups showed a decline.

Conclusion: The national trends in childhood undernutrition in Kenya showed significant declines in underweight while trends in wasting and stunting were stagnant. Analyses disaggregated by demographic and socio-economic segments revealed some significant departures from these overall trends, some improving and some worsening. These findings support the importance of conducting trend analyses at detailed levels within countries, to inform the development of better-targeted childcare and feeding interventions.

Keywords: Undernutrition, Wasting, Stunting, Underweight, Trends, Demographic and Health Survey, Kenya

Background

Worldwide, about 2.2 million children die annually, with poor nutritional status as an underlying cause [1]. Global statistics for surviving undernourished children indicate that approximately 171 million children are chronically undernourished (stunted), 60 million are acutely undernourished (wasted), and 100 million are underweight [2]. Undernutrition is not only linked to child mortality but also to poor functional development of the child. Undernourished children are highly susceptible to common childhood ailments like diarrhea, respiratory infections and worm infestations. Recurrence of such ailments falters a child's physical, behavioral, motor and cognitive development, and also compromises her/his health and functioning in adulthood [3]. Combatting child undernutrition is obviously crucial, and its complexity makes it hard to tackle. It results not only from macronutrient deficiencies (protein, fat and carbohydrate) but also from micronutrient deficiencies (trace minerals and vitamins), among which zinc deficiency is particularly deleterious to children's normal growth [4]. Therefore, different aspects of food deprivation (quantity, quality and food group diversity) lead to different manifestations of undernutrition (wasting, stunting and underweight). Consequently, child undernutrition is a multidimensional problem that defies simple solutions. There is a fundamental need to better understand the public health dimensions of the problem, to provide a foundation for precisely targeted interventions in local contexts.

The burden of child undernutrition is unsurprisingly greatest in the world's poorest countries, especially in

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sub-Saharan Africa and Asia [5]. This is a highly salient issue in Kenya, which is among the 20 countries that account for 80% of the world's chronically undernourished children [6]. The most recent Kenyan national prevalence estimates are 35% for stunting, 7% for wasting and 16% for underweight [7,8].

A child who experiences a chronic shortage of appropriate types and quantities of food is likely to grow in height/length more slowly than expected for children of the same sex and age. Such a shortfall in growth, termed 'stunting', is a classical indicator of underlying child undernutrition. A child who experiences acute food shortage and/or infection is likely to gain weight more slowly than expected for children of the same sex and height/length. Such a shortfall in growth is termed 'wasting', which is also a classical indicator of underlying undernutrition. Underweight is a composite indicator of stunting and wasting and thus an overall indicator of the extent of child undernutrition [9,10]. Underweight however is not a very useful indicator for interventions as it does not differentiate the extent of stunting and wasting.

According to the World Health Organisation (WHO) 2006 classification of child undernutrition, children with a Z-score below −2 Standard Deviations (SD) of the median for weight-for-height/length (WHZ) or (WLZ), height/length-for-age (HAZ) or (LAZ) and weight-for-age (WAZ) are classified as wasted, stunted and underweight respectively. Children with a Z-score below −3 SD of the median are classified as severely undernourished, while those with a Z-score between −2 SD and −3 SD are classified as being moderately undernourished. Those with a Z-score between −1 SD and −2 SD are classified as mildly undernourished [9].

There is a tendency in the literature to define and describe child undernutrition at an aggregate level, for example by reporting national prevalence for all children ages 0–59 months, without differentiation by age, sex and other factors. Yet, important differentiations do exist for specific demographic and socio-economic segments in the under-five population and nutrition interventions are correspondingly specific. In sub-Saharan Africa, boys have consistently posted higher rates of stunting compared to girls [11]. Many (sometimes contradicting) reasons have been hypothesized to explain the sex difference, such as gender-differentiated feeding practices [12,13]. It is also postulated that girls are physically less active and therefore spend less energy compared to boys, and that boys are more vulnerable to acute respiratory infection and diarrhoea [14].

Undernutrition is most critical during the first two years of life, especially stunting, after which it is difficult to restore normal growth [15]. During this early period, poor infant and young nutrition and care practices coupled with infectious diseases increase the probability of child undernutrition [16]. Studies conducted in developing countries indicate that exclusive breastfeeding is not common, with complementary foods introduced very early [17,18]. This leads to faltering child growth [19].

Level of maternal education has been documented as a determining factor in child undernutrition. In an environment with sufficient resources, mothers with education are more likely to utilize modern health care and have good health care knowledge and reproductive behaviours [20,21]. Maternal education does not, however, automatically impart nutrition knowledge, and thus mothers with education may still have undernourished children.

Given this background, it cannot be assumed that international or national trends reflect sub-group trends with validity; it is an empirical question requiring appropriate sub-group analyses. This study therefore aimed to describe time trends in child undernutrition prevalence in Kenya, with overall trends decomposed by age, province[a], urban/rural residence, maternal education level and Wealth Index (WI), for boys and girls separately. Previous studies which have examined sub-groups in Kenya are inadequate for today's needs for one or more of these reasons: the design was a single cross-sectional survey and therefore not useful to define trends over time; the study sample was not nationally representative data; the study was conducted before 2006 and hence used outdated reference standards for child growth [17,22-26].

The present study addresses these limitations, by undertaking trend analyses of stunting, wasting and underweight, in defined sub-groups in Kenya, and using the 2006 WHO child growth standards in the analysis of data collected from four cross-sectional surveys conducted in 1993, 1998, 2003 and 2008–09. The surveys used identical methods, making their results comparable.

Methods

Data

This study used data from the Kenya Demographic and Health Survey (KDHS), a series of national cross-sectional surveys conducted in 1993, 1998, 2003 and 2008–09 (data from KDHS earlier than 1993 are not used). These datasets are publicly accessible through application to MEASURE DHS[b] [26]. In all survey years, data were collected using identical questionnaire items for women of reproductive age 15–49 years old. In all four surveys, a standard child anthropometry protocol was used. Children 0–59 months were weighed using scales fitted with a digital screen and measured for height using a measuring board. Weight was recorded in kilograms and height/length in centimeters. Children younger than 24 months were measured lying down on the board (recumbent length), while standing height was recorded for older children. Extensive information on data collection and management has been published elsewhere [7,27-30].

Table 1 shows the two-stage sampling design used by the Kenya Demographic and Health Survey. The first stage involved selecting data collection points (clusters) from the national master sample frame and then households were systematically sampled from the selected clusters with women of ages 15–49 years eligible for interview [7,27-29].

To enable a trend analysis, variables of interest were identified in the base year data file (1993). Thereafter, data files were sorted by their identification variables and the four cross-sectional datasets of 1993, 1998, 2003 and 2008–09 were merged into a single data file. Besides examining trends for the samples as wholes, sub-group analyses were undertaken, separately for boys and girls, by age, province, residence, maternal education and WI. In each trend analysis, logistic regression was used to test the null hypothesis that the regression coefficient β for survey year was not significantly different from zero, using the equation:

$$log(p/1-p) = \beta_0 + \beta_{survey\ year} \cdot \ survey\ year$$

Due to lack of anthropometry data for children older than 36 months in the 1998 survey, the analysis reported in this paper was restricted to children aged 0–35 months. This allowed comparability of trends across the four surveys from 1993 to 2009. The age categories analyzed were 0–5 months, 6–11 months, 12–23 months and 24–35 months. During the 1993 and 1998 survey years, KDHS did not collect data in North-Eastern province. Consequently, North-Eastern province was excluded in the analysis in order to allow comparison of prevalence across all the four survey years. Provinces included in the analysis include Nairobi, Central, Coast, Eastern, Nyanza, Rift-Valley and Western.

Self-reported maternal education level was categorized as no education, incomplete primary, complete primary and incomplete secondary education. Sample size limitations in the 1993 survey for the higher education category were overcome by combining the complete secondary education and higher education categories in the analyses presented in this paper.

Standard of living measurement involved classification of children into quintiles based on the household Wealth Index. This is a proxy for standard of living based on household ownership of assets and housing quality. Each asset is assigned a factor score generated through principal component analysis, with the scores summed and standardized. All individuals are assigned the score and the quintile (poorest, poorer, middle, richer and richest) of their household [31].

Table 1 Sampling design, KDHS

	1993	1998	2003	2008-09
Clusters Selected	536	536	400	400
Households Selected	8805	9465	9865	9936
Women Interviewed	7540	7881	8195	8444
Response Rate	95%	96%	94%	96%

Child anthropometry

In assessing children's nutritional status, wasting (low weight-for-length/height), stunting (low length/height-for-age) and underweight (low weight-for-age) were used as the three indicators of child undernutrition. In conformity with the recommended World Health Organization (WHO) child growth standards of 2006, the SPSS syntax file 'igrowup_DHSind.sps' was used to calculate Z-scores for the three anthropometric indicators. Children were considered wasted, stunted or underweight if their WHZ/WLZ, HAZ/LAZ and WAZ score was less than −2 SD respectively. Extreme Z-scores considered to be biologically implausible were flagged and not used in the analysis if WHZ/WLZ score was less than −5 SD or greater than 5 SD, HAZ/LAZ score was less than −6 SD or greater than 6 SD and WAZ score was less than −6 SD or greater than 5 SD [32,33].

Analysis

SPSS for windows version 19 was used to conduct the analyses. The design effect parameters 'sampling weight', 'sample domain' and 'sample cluster' [32] were incorporated using SPSS' Complex Samples Module. In line with recommendations that emphasize provision of levels of uncertainty in the estimates of undernutrition [33], 95% confidence intervals (C.I.) for the prevalence estimates were computed and are presented in Tables 2, 3, 4. Logistic regression was used to test trends. This involved modeling change in undernutrition prevalence regressed on time (the four survey years) with probability values for Wald F tests less than 0.05 considered significant (Tables 2, 3, 4). It is important to note that in the Tables, the 95% C.I. are calculated separately for each prevalence estimate and are not associated with the Wald F statistics that were generated by the logistic regression tests for trends.

Results

Description of the study samples

Table 5 shows the sample distributions for each year by child's growth, sex and age, and by province, urban/rural residence, maternal education and Wealth Index. Sample sizes in the various socio-demographic groups varied considerably, affecting the comparability of the Wald F Statistics generated by logistic regression in the tests of trends (shown in Tables 2, 3, 4). This variability should be kept in mind in the examination of the data in Tables 2, 3, 4.

Table 2 Wasting trends by age, province, residence, maternal education and wealth index, KDHS

		1993			1998			2003			2008-09					
	Sex	**n**	**%**	**C.I.**	**n**	**%**	**C.I.**	**n**	**%**	**C.I.**	**n**	**%**	**C.I.**	**Wald F**	**P-value**	**Trend**
Total	M/F	2,969	8.4	7.2-9.8	2,921	8.7	7.6-10.0	3,020	7.2	6.0-8.5	3,028	7.4	6.1-8.9	2.206	0.138	
	M	1,789	9.1	7.5-10.9	1,501	9.2	7.7-10.9	1,818	8.6	7.0-10.5	1,807	8.6	7.0-10.5	0.259	0.611	
	F	1,180	7.3	5.8-9.3	1,420	8.2	6.7-10.1	1,202	5.0	3.8-6.5	1,221	5.6	4.3-7.4	5.338	0.021	↘
Age																
0-5 months	M	275	9.7	6.3-14.7	273	9.9	6.5-14.6	342	10.0	6.9-14.4	308	8.0	5.2-12.2	0.293	0.589	
	F	160	8.3	4.8-14.1	179	8.6	5.0-14.4	170	5.6	2.9-10.6	142	12.8	7.8-20.2	0.391	0.532	
6-11 months	M	367	10.4	7.3-14.6	293	14.9	10.4-20.9	366	10.0	7.1-13.9	373	13.2	8.1-20.8	0.104	0.747	
	F	179	7.0	4.0-12.0	232	9.9	6.4-15.2	221	4.7	2.6-8.3	185	6.5	3.2-13.0	0.056	0.812	
12-23 months	M	648	10.2	7.4-14.0	528	9.1	6.8-12.1	638	8.9	6.6-12.0	583	5.3	3.6-7.8	5.714	0.017	↘
	F	360	8.9	5.9-13.3	489	9.8	7.1-13.3	385	6.4	4.3-9.5	430	4.2	2.7-6.6	8.977	0.003	↘
24-35 months	M	500	6.2	4.3-9.0	407	4.6	2.8-7.4	472	6.1	4.0-9.4	543	9.2	5.8-14.3	3.139	0.077	
	F	482	6.0	4.0-8.8	520	5.9	4.0-8.6	426	3.5	2.0-6.1	464	4.4	2.4-8.0	1.431	0.232	
Province																
Nairobi	M	58	4.8	1.3-16.3	120	13.8	8.3-22.2	111	4.6	2.1-10.1	84	9.7	4.0-21.7	0.010	0.922	
	F	43	0.0		68	10.8	3.8-26.9	88	4.9	1.2-18.2	73	2.9	0.6-12.5	0.089	0.766	
Central	M	199	3.5	1.4-8.3	127	9.2	5.2-15.9	182	5.2	2.8-9.3	122	5.2	2.5-10.5	0.213	0.645	
	F	159	4.6	2.0-10.2	142	8.2	3.7-17.1	145	6.6	3.6-11.6	110	7.2	3.6-14.1	0.409	0.524	
Coast	M	146	13.7	9.5-19.4	126	7.4	4.4-12.2	167	8.2	5.0-13.2	173	13.7	8.9-20.5	0.012	0.913	
	F	93	13.9	8.3-22.3	112	6.4	3.7-10.8	97	4.7	2.1-10.0	108	11.8	7.2-18.7	0.172	0.679	
Eastern	M	344	10.5	7.0-15.6	230	6.8	4.0-11.3	321	7.9	4.7-12.8	268	4.8	2.7-8.2	3.981	0.048	↘
	F	248	11.7	7.3-18.0	259	6.4	3.3-12.1	184	2.7	1.0-7.5	233	5.7	2.8-11.1	3.583	0.060	
Nyanza	M	292	9.6	6.7-13.6	312	12.9	9.0-18.2	278	6.3	3.7-10.6	385	6.1	4.1-9.0	6.403	0.012	↘
	F	189	5.2	2.6-10.0	297	11.2	8.1-15.4	201	1.5	0.5-5.0	222	4.5	2.3-8.7	3.496	0.063	
Rift-Valley	M	418	10.9	7.2-16.3	396	7.8	5.4-11.2	520	12.6	9.0-17.5	533	13.4	10.0-17.8	1.794	0.182	
	F	268	7.5	4.8-11.6	340	7.7	5.3-11.2	323	6.3	3.9-10.2	318	6.4	3.6-11.2	0.375	0.541	
Western	M	333	6.8	4.4-10.4	193	6.9	4.0-11.8	239	8.3	4.5-14.9	242	3.8	1.6-8.8	0.777	0.379	
	F	181	4.2	2.0-8.6	203	7.2	4.0-12.6	163	7.8	4.7-12.6	158	1.5	0.5-4.8	1.199	0.275	
Residence																
Urban	M	192	6.4	3.8-10.7	283	7.9	4.8-12.7	324	5.6	3.6-8.6	305	7.4	4.7-11.5	0.001	0.973	
	F	135	5.9	3.0-11.5	244	7.9	4.8-12.9	222	3.8	1.7-8.6	244	3.5	1.8-6.6	3.611	0.058	
Rural	M	1,598	9.4	7.7-11.4	1,218	9.5	7.8-11.4	1,494	9.3	7.4-11.5	1,502	8.8	7.0-11.1	0.182	0.670	
	F	1,046	7.5	5.8-9.6	1,177	8.3	6.6-10.3	980	5.2	3.9-7.0	977	6.2	4.6-8.3	2.982	0.085	
Maternal Education																
No education	M	309	16.2	11.8-21.9	164	7.6	4.2-13.5	236	18.4	13.0-25.5	182	18.6	13.4-25.3	1.126	0.289	
	F	206	12.4	8.4-17.8	144	11.3	6.8-18.4	155	6.0	2.7-12.6	114	8.7	4.7-15.4	2.498	0.115	
Incomplete primary	M	710	9.4	7.1-12.2	557	12.2	9.5-15.4	678	11.1	8.5-14.4	666	8.5	6.1-11.6	0.296	0.587	
	F	476	6.6	4.5-9.7	548	8.6	6.3-11.7	456	5.7	3.8-8.4	411	4.8	2.6-8.4	2.006	0.157	
Complete primary	M	366	8.0	5.6-11.4	377	9.1	6.3-13.1	519	3.4	2.0-5.5	562	6.6	4.5-9.7	1.994	0.158	
	F	226	6.4	3.6-11.0	370	8.6	5.7-12.8	326	5.1	3.1-8.3	363	8.9	5.6-13.8	0.186	0.666	
Incomplete secondary	M	363	4.4	2.4-7.8	148	7.3	3.7-14.2	165	5.3	2.5-11.0	157	7.4	3.7-14.1	1.048	0.306	
	F	227	4.6	2.5-8.0	132	5.1	2.2-11.6	97	4.7	1.8-11.6	111	4.1	1.5-10.7	0.024	0.878	

Table 2 Wasting trends by age, province, residence, maternal education and wealth index, KDHS *(Continued)*

Secondary +	M	42	1.1	0.2-7.9	256	4.8	2.4-9.1	220	5.3	2.8-9.7	240	6.7	3.9-11.5	1.718	0.190	
	F	45	10.5	3.7-26.5	225	6.6	3.8-11.3	168	1.9	0.7-4.7	223	1.2	0.4-3.4	14.170	0.000	↘
Wealth Index																
Poorest	M	403	15.2	11.3-20.2	378	11.3	8.1-15.6	442	10.7	7.2-15.7	433	13.0	9.7-17.2	0.601	0.439	
	F	279	7.6	4.5-12.4	345	9.3	6.5-13.1	263	6.9	4.2-11.2	264	7.6	4.5-12.6	0.086	0.769	
Poorer	M	395	10.1	7.3-13.7	302	12.2	8.8-16.5	391	10.8	7.4-15.4	415	9.6	5.1-17.4	0.053	0.818	
	F	240	10.9	7.4-15.7	303	8.0	5.2-12.2	269	5.2	3.0-9.1	243	7.0	3.4-13.7	1.858	0.173	
Middle	M	385	6.6	4.4-9.6	288	5.9	3.2-10.4	347	7.5	4.8-11.3	350	5.8	3.1-10.6	0.010	0.922	
	F	227	8.0	4.7-13.3	258	9.8	6.3-14.8	236	3.5	1.8-6.6	240	4.9	2.7-8.9	3.945	0.047	↘
Richer	M	343	7.8	4.9-12.2	271	6.0	3.6-9.9	316	7.4	4.5-11.7	305	7.1	4.5-10.9	0.028	0.868	
	F	231	5.1	2.6-9.8	258	8.1	4.7-13.5	213	4.8	2.4-9.1	246	5.7	3.1-10.3	0.036	0.849	
Richest	M	264	3.4	1.8-6.4	262	9.5	6.1-14.5	323	5.6	3.5-8.8	305	5.6	3.1-9.8	0.100	0.752	
	F	204	4.7	2.5-8.8	256	5.6	3.2-9.9	221	4.1	1.8-9.1	229	2.5	1.1-5.5	1.983	0.160	

C.I, 95% confidence intervals; Secondary +, complete secondary and/or higher education; ↘ significant decreasing trend.

Trends in wasting

National trends for boys and girls combined and for boys aged 0–35 months showed no decline in wasting across the study period (Table 2), while wasting did decrease significantly for girls from 7.3% in 1993 to 5.6% in 2008–09 ($F(1, 1136) = 5.34$, $p < 0.021$). The decline in girls was concentrated in the age group 12–23 months ($F(1, 1046) = 8.98$, $p < 0.003$), and the decline in boys was concentrated in the same age group ($F(1, 1046) = 5.71$, $p < 0.017$).

By province, a departure from the overall trends was observed in Eastern and Nyanza provinces. In Eastern province, wasting among boys decreased significantly from 10.5% in 1993 to 4.8% in 2008–9 ($F(1, 172) = 3.98$, $p < 0.048$). Boys in Nyanza province posted a significant decline in wasting from 9.6% in 1993 to 6.1% in 2008–9 ($F(1, 161) = 6.40$, $p < 0.012$). Analyses by maternal education showed that the prevalence of wasting among girls with mothers having complete secondary and/or higher education declined significantly from 10.5% to 1.2% from 1993 to 2008–9 ($F(1, 611) = 14.17$, $p < 0.000$). Trends by urban/rural residence were not statistically significant while those by WI showed girls in the middle quintile decrease from 8.0% in 1993 to 4.9% in 2008–09 ($F(1, 735) = 3.95$, $p < 0.047$).

Comparing wasting prevalence between two survey years (1993 versus 2008–09), boys recorded poor growth patterns as compared to girls. Prevalence for boys increased among 6–11 months olds (10.4% to 13.2%), boys in Rift-Valley increased (10.9% to 13.4%), and boys born to mothers with no education (16.2% to 18.6%).

Trends in stunting

Nationally, prevalence in stunting for boys and girls combined remained stagnant across the survey years. The gender-specific trends showed boys' trend declining from 41.7% in 1993 to 36.9% in 2008–9 ($F(1, 1137) = 4.63$, $p < 0.032$) while the trend for girls was stable (Table 3). There was a worsening trend in stunting for girls aged 12–23 months, with stunting increasing from 31.3% in 1993 to 40.1% in 2008–09 ($F(1, 1044) = 4.18$, $p < 0.041$). However among girls aged 24–35 months, stunting declined significantly from 53.1% in 1993 to 43.1% in 2008–09 ($F(1, 1017) = 9.88$, $p < 0.002$). Analyses by province showed significant decreases in stunting prevalence for boys in Nyanza from 40.6% in 1993 to 30.8% in 2008–09 ($F(1, 162) = 5.35$, $p < 0.022$).

The trends by maternal education were not significant for most sub-groups except a decline in stunting among boys born to mothers with incomplete primary education, from 48.8% in 1993 to 41.5% in 2008–09 ($F(1, 956) = 5.05$, $p < 0.025$). By WI, most trends were not statistically significant, with the exception of a decline among boys living in households in the richer WI quintile ($F(1, 717) = 5.98$, $p < 0.015$).

While the overall national trend in stunting for boys and girls combined stagnated during the study period, girls' prevalence seemed to have gotten worse in certain socio-demographic segments comparing 1993 versus 2008–09. Stunting prevalence was severe in 1993 and still increased by 2008–09 among girls aged 12–23 months (31.3% to 40.1%), girls born to mothers with no education (42.9% to 44.0%), girls born to mothers with complete primary education (31.8% to 34.7%), and girls belonging to the poorest (44.0% to 46.6%) and middle (34.4% to 39.6%), wealth quintiles.

Trends in underweight

Table 4 provides the detailed trend analysis for underweight. The national trend for all children and separate

Table 3 Stunting trends by age, province, residence, maternal education and wealth index, KDHS

		1993			1998			2003			2008-09					
	Sex	**n**	**%**	**C.I.**	**n**	**%**	**C.I.**	**n**	**%**	**C.I.**	**n**	**%**	**C.I.**	**Wald F**	**P-value**	**Trend**
Total	M/F	2,996	39.5	37.3-41.7	2,951	37.1	34.9-39.2	3,033	36.1	33.9-38.4	3,051	36.5	33.6-39.5	2.681	0.102	
	M	1,805	41.7	38.9-44.7	1,511	39.5	36.8-42.2	1,827	38.8	36.0-41.6	1,822	36.9	33.7-40.2	4.634	0.032	↘
	F	1,191	36.0	32.8-39.3	1,440	34.5	31.7-37.5	1,206	32.1	29.0-35.4	1,229	35.9	31.7-40.3	0.089	0.766	
Age																
0-5 months	M	276	20.5	15.4-26.7	286	17.9	13.4-23.6	355	17.8	13.4-23.2	320	14.3	9.0-22.1	2.288	0.131	
	F	167	10.6	6.4-16.9	190	15.7	10.7-22.5	169	14.5	9.5-21.6	149	15.5	8.9-25.8	0.135	0.713	
6-11 months	M	372	24.9	20.5-29.9	290	24.5	19.1-30.7	363	21.5	16.9-26.9	372	27.3	21.8-33.6	0.011	0.917	
	F	178	22.9	16.4-31.0	239	18.6	13.7-24.7	223	16.0	11.1-22.4	184	24.3	16.6-34.0	0.108	0.742	
12-23 months	M	655	52.9	48.0-57.8	528	50.5	45.9-55.1	642	50.4	45.5-55.3	580	49.7	43.8-55.5	0.488	0.485	
	F	360	31.3	26.1-37.0	489	36.9	32.5-41.7	386	38.7	33.3-44.3	432	40.1	31.5-49.4	4.179	0.041	↗
24-35 months	M	502	51.3	46.1-56.5	407	51.0	45.5-56.5	467	52.2	46.8-57.6	550	43.1	37.1-49.4	3.242	0.072	
	F	485	53.1	47.6-58.5	522	46.4	41.6-51.3	428	41.5	35.9-47.4	464	43.1	37.6-48.7	9.880	0.002	↘
Province																
Nairobi	M	65	61.7	46.3-75.1	120	32.3	24.0-41.8	111	29.2	22.0-37.6	85	30.4	20.9-41.9	8.505	0.005	↘
	F	46	18.2	10.7-29.1	66	27.8	15.4-44.9	89	18.4	11.8-27.6	73	30.6	20.8-42.6	0.880	0.351	
Central	M	202	45.2	36.0-54.7	127	41.9	33.5-50.8	188	41.2	33.7-49.2	126	37.2	29.0-46.1	1.317	0.253	
	F	160	34.4	27.1-42.4	145	32.4	21.8-45.2	145	31.0	23.9-39.0	110	24.1	15.3-35.8	2.149	0.145	
Coast	M	145	42.0	34.4-50.0	128	48.5	36.7-60.5	168	41.0	32.6-50.0	174	39.9	34.3-45.8	0.505	0.478	
	F	96	47.3	37.8-57.0	113	41.0	32.4-50.2	98	41.3	31.4-51.9	108	42.2	28.1-57.7	0.224	0.636	
Eastern	M	345	46.3	39.5-53.2	238	42.3	36.5-48.4	319	42.6	35.0-50.5	269	43.1	37.1-49.4	0.457	0.500	
	F	246	45.5	37.5-53.8	261	38.9	32.5-45.7	189	33.7	24.4-44.5	235	39.7	31.9-48.1	1.249	0.265	
Nyanza	M	297	40.6	34.7-46.8	310	33.8	28.0-40.1	279	33.2	27.3-39.7	381	30.8	26.1-35.9	5.347	0.022	↘
	F	191	37.9	31.2-45.1	307	33.5	27.4-40.1	204	32.2	25.1-40.2	220	35.0	28.1-42.6	0.262	0.609	
Rift-Valley	M	420	39.1	32.9-45.6	393	39.8	36.1-43.7	516	40.3	35.0-45.8	545	41.2	33.5-49.4	0.178	0.673	
	F	269	27.6	22.0-34.0	346	32.9	27.4-38.9	318	32.7	27.0-38.9	326	38.3	27.3-50.6	2.240	0.136	
Western	M	331	35.3	29.6-41.5	196	41.3	33.1-50.0	245	38.0	31.2-45.3	242	30.1	25.5-35.2	1.235	0.268	
	F	184	33.6	25.9-42.2	201	33.4	26.9-40.6	165	32.0	24.1-41.1	158	32.9	25.1-41.8	0.038	0.846	
Residence																
Urban	M	199	41.9	32.7-51.6	281	30.4	24.9-36.5	327	35.3	29.4-41.7	307	29.5	23.7-36.0	2.647	0.105	
	F	138	17.7	12.0-25.5	247	27.7	20.9-35.6	223	24.4	19.5-30.0	244	25.7	16.4-37.7	0.452	0.502	
Rural	M	1,606	41.7	38.7-44.8	1,230	41.5	38.6-44.5	1,500	39.5	36.4-42.7	1,515	38.4	34.9-42.1	2.300	0.130	
	F	1,052	38.4	35.0-41.9	1,193	36.0	32.9-39.2	983	33.9	30.3-37.6	985	38.4	34.1-43.0	0.057	0.812	
Maternal Education																
No education	M	313	44.0	37.5-50.8	166	49.3	39.4-59.2	233	41.7	32.8-51.2	190	36.8	29.1-45.3	1.975	0.161	
	F	209	42.9	35.3-50.9	144	43.8	34.3-53.8	152	41.3	31.3-52.0	114	44.0	29.9-59.2	0.000	0.998	
Incomplete primary	M	716	48.8	44.6-53.0	573	44.7	40.4-49.1	683	42.1	37.9-46.4	664	41.5	36.2-47.1	5.069	0.025	↘
	F	475	41.1	36.0-46.5	561	39.1	34.9-43.5	457	35.9	30.6-41.5	410	40.6	34.6-47.0	0.180	0.671	
Complete primary	M	367	40.4	34.9-46.2	380	37.8	32.7-43.2	526	38.6	33.9-43.5	565	40.1	33.9-46.8	0.004	0.951	
	F	228	31.8	25.5-38.8	371	38.0	32.4-43.8	330	35.8	30.5-41.5	369	34.7	28.7-41.2	0.041	0.839	
Incomplete secondary	M	367	29.3	23.5-35.9	139	31.9	23.8-41.2	165	39.4	30.2-49.4	156	27.8	20.0-37.3	0.229	0.633	
	F	232	24.3	18.7-31.0	135	27.5	20.5-35.8	96	21.1	13.0-32.3	112	27.4	18.3-38.7	0.043	0.836	

Table 3 Stunting trends by age, province, residence, maternal education and wealth index, KDHS *(Continued)*

Secondary +	M	42	24.0	12.6-40.9	254	28.0	22.7-34.0	219	25.2	19.7-31.5	247	23.1	16.7-31.1	0.700	0.403	
	F	46	31.2	18.1-48.2	228	16.0	11.6-21.7	171	12.8	8.8-18.2	224	29.3	20.9-39.5	1.749	0.187	
Wealth Index																
Poorest	M	405	48.6	42.8-54.5	384	50.6	44.5-56.6	448	45.8	40.9-50.8	450	42.9	36.8-49.3	2.568	0.110	
	F	281	44.0	37.8-50.5	353	44.0	38.1-50.1	261	40.4	33.4-47.9	268	46.6	39.8-53.4	0.066	0.797	
Poorer	M	399	43.9	38.3-49.7	303	41.7	36.0-47.5	389	38.5	33.0-44.3	411	44.7	37.6-51.9	0.003	0.960	
	F	243	37.7	31.6-44.2	307	40.9	34.8-47.3	272	35.1	29.2-41.6	247	37.4	28.8-46.9	0.174	0.677	
Middle	M	385	40.9	34.9-47.2	288	35.8	29.5-42.6	350	34.5	28.5-40.9	345	32.7	26.9-39.1	3.596	0.058	
	F	227	34.4	28.0-41.5	261	35.6	30.1-41.5	236	34.0	27.5-41.1	241	39.6	31.2-48.7	0.633	0.426	
Richer	M	346	41.7	35.9-47.9	279	38.2	32.6-44.1	312	40.1	33.8-46.7	304	28.9	22.5-36.3	5.982	0.015	↘
	F	232	41.8	34.8-49.1	262	31.1	24.7-38.4	211	29.2	22.9-36.5	241	32.5	23.4-43.1	1.999	0.158	
Richest	M	270	29.4	23.4-36.2	258	26.0	20.2-32.7	328	32.9	26.5-39.9	312	30.7	23.5-38.9	0.439	0.508	
	F	207	18.4	13.3-25.0	259	16.5	11.7-22.7	227	19.5	15.1-24.8	231	21.6	14.6-30.7	0.713	0.399	

C.I, 95% confidence intervals; Secondary +, complete secondary and/or higher education; ↘, significant decreasing trend; ↗, significant increasing trend.

trends for boys and girls showed significant declines in underweight. Underweight declined among boys and girls combined, from 19.7% in 1993 to 15.0% in 2008–9 ($F(1, 1136) = 11.80$, $p < 0.001$), among boys from 21.4% in 1993 to 16.4% in 2008–09 ($F(1, 1136) = 7.96$, $p < 0.005$), and among girls from 17.2% in 1993 to 12.8% in 2008–09 ($F(1, 1136) = 7.24$, $p < 0.007$). Age specific analysis showed significant declines among boys aged 0–5 months ($F(1, 932) = 9.37$, $p < 0.002$), girls aged 6–11 months ($F(1, 925) = 4.09$, $p < 0.043$), and boys aged 12–23 months ($F(1, 1048) = 8.32$, $p < 0.004$).

Provincial analyses showed significant declines in underweight among boys and girls in Nyanza. Boys' prevalence reduced from 21.6% in 1993 to 14.0% in 2008–09 ($F(1, 161) = 6.95$, $p < 0.009$) and that for girls reduced from 20.9% in 1993 to 10.8% in 2008–09 ($F(1, 161) = 10.39$, $p < 0.002$). Boys and girls residing in rural areas recorded significant declines in underweight with boys' levels reducing from 22.6% in 1993 to 17.1% in 2008–09 ($F(1, 871) = 8.31$, $p < 0.004$), and girls' levels declining from 18.4% in 1993 to 13.8% in 2008–09 ($F(1, 871) = 6.30$, $p < 0.012$).

Most of the trend analyses of maternal education were not statistically significant. Only boys born to mothers with incomplete primary education showed a significant decline from 26.1% in 1993 to 19.4% in 2008–09 ($F(1, 967) = 7.44$, $p < 0.006$). There was a significant declining trend in underweight among boys in the poorest wealth quintile, from 31.7% in 1993 to 24.2% in 2008–09 ($F(1, 551) = 5.40$, $p < 0.020$) and among girls in the richer wealth quintile, from 15.2% in 1993 to 7.6% in 2008–09 ($F(1, 716) = 4.26$, $p < 0.039$). Comparison between the 1993 and 2008–09 surveys showed that prevalence of underweight dropped in 2008–09 in almost all sub-groups.

Discussion

For each survey year, the wasting prevalence estimate was slightly lower for girls than for boys, which is consistent with previous studies from sub-Saharan Africa [34,35]. The overall national trend for wasting showed no significant change in the study period but there were important differences in the trends by age and sex. Older children aged 12–23 months showed a declining trend. Evidence on child growth patterns from many countries in the developing world shows that the prevalence of wasting is stable at all measurement points from about 12 months of age and on, after a six month period of sharply increasing wasting prevalence following weaning [36]. Therefore, the lessened risk of wasting over time observed in this study among Kenyan 12–23 month olds may be a result of improved post-weaning child care and feeding from the mid-1990's on. This calls for closer investigation of archival data from KDHS and other sources on care and feeding patterns during the past two decades, to observe which care and feeding factors and trends may account for the reduction in wasting. The emphasis on overall care, and not just feeding, is in concert with recent conclusions that proper hygiene practices and access to adequate water, proper sanitation and reliable health services may be as important or even more important determinants of child growth than feeding practices [37].

As to sex differences, wasting among girls overall declined significantly, while remaining stable among boys. Yet some groups of boys did improve. Using a liberal criterion for significance of $p < 0.10$, the pattern of significant trends in wasting (12 trends as shown in Table 2) were all in the direction of improvement, observed predominantly in females. But trends in wasting also showed significant improvement among older boys and

Table 4 Underweight trends by age, province, residence, maternal education and wealth index, KDHS

		1993			1998			2003			2008-09					
	Sex	n	%	C.I.	n	%	C.I.	n	%	C.I.	n	%	C.I.	Wald F	P-value	Trend
Total	M/F	3,115	19.7	17.9-21.6	3,051	17.6	16.0-19.4	3,148	16.0	14.4-17.8	3,147	15.0	13.0-17.2	11.804	0.001	↘
	M	1,881	21.4	19.1-23.8	1,580	19.4	17.2-21.9	1,880	18.7	16.4-21.2	1,890	16.4	14.1-19.1	7.964	0.005	↘
	F	1,234	17.2	14.6-20.2	1,471	15.6	13.6-18.0	1,269	12.1	10.0-14.5	1,257	12.8	10.3-15.7	7.237	0.007	↘
Age																
0-5 months	M	307	13.4	9.6-18.4	309	9.3	6.1-14.0	381	9.8	6.7-13.8	352	5.1	3.0-8.4	9.369	0.002	↘
	F	178	7.6	4.5-12.5	195	8.9	5.4-14.4	2,001	4.4	2.2-8.6	160	5.8	2.6-12.5	1.781	0.182	
6-11 months	M	379	18.0	14.0-22.8	305	16.4	12.3-21.4	370	17.0	13.3-21.6	386	18.2	12.3-26.0	0.016	0.898	
	F	189	14.1	9.4-20.6	242	10.6	6.9-16.2	229	8.4	5.3-13.2	187	6.2	3.2-11.9	4.093	0.043	↘
12-23 months	M	674	26.4	22.4-30.9	546	22.1	18.4-26.1	649	22.1	18.0-26.9	597	17.9	14.5-22.0	8.317	0.004	↘
	F	371	17.6	13.5-22.5	504	16.8	13.4-20.8	396	15.0	11.4-19.5	439	11.4	7.5-16.8	1.720	0.190	
24-35 months	M	520	22.1	18.4-26.2	420	25.8	21.2-30.9	480	22.2	18.0-27.2	555	20.9	16.1-26.7	0.146	0.702	
	F	496	21.6	17.3-26.6	530	19.3	16.0-23.2	443	14.9	11.3-19.5	470	19.0	15.1-23.8	3.309	0.069	
Province																
Nairobi	M	72	11.5	4.9-24.9	121	13.6	8.2-21.8	114	6.2	3.1-12.2	93	9.2	5.2-15.7	1.198	0.277	
	F	51	2.7	0.4-15.4	72	2.6	0.4-14.7	91	4.5	2.1-9.5	80	7.3	2.7-18.4	1.330	0.252	
Central	M	201	16.0	12.1-21.0	138	8.4	4.6-14.7	188	12.3	8.4-17.8	131	12.7	5.7-25.7	0.313	0.576	
	F	165	10.8	6.5-17.2	149	10.8	5.8-19.1	154	9.0	5.3-15.0	115	10.3	5.6-18.1	0.077	0.782	
Coast	M	173	29.5	23.0-36.9	134	23.4	15.1-34.5	178	19.9	14.7-26.3	178	23.2	17.3-30.4	1.807	0.181	
	F	110	25.7	17.5-36.2	115	19.4	14.4-25.4	102	13.8	8.2-22.3	109	20.9	14.4-29.5	1.015	0.315	
Eastern	M	357	23.7	18.2-30.4	256	22.2	16.9-28.7	326	20.7	15.8-26.8	275	16.9	12.0-23.2	2.548	0.112	
	F	262	24.3	16.9-33.7	270	18.4	14.0-23.8	195	11.4	6.6-19.1	235	14.3	8.6-23.1	3.711	0.056	
Nyanza	M	308	21.6	17.4-26.6	315	22.7	17.6-28.8	291	14.6	10.1-20.8	398	14.0	9.9-19.4	6.951	0.009	↘
	F	193	20.9	15.1-28.1	302	20.2	14.8-27.0	214	9.1	5.2-15.5	226	10.8	7.0-16.3	10.394	0.002	↘
Rift-Valley	M	432	24.0	18.9-30.1	417	19.0	15.3-23.5	537	23.0	18.0-28.9	570	20.2	15.7-25.5	0.403	0.526	
	F	271	12.8	9.2-17.6	357	13.8	10.1-18.4	347	15.1	10.7-21.0	331	13.6	8.2-21.6	0.075	0.784	
Western	M	337	16.4	12.1-22.0	197	20.0	13.2-29.1	245	21.0	14.8-28.9	245	11.1	6.4-18.5	0.768	0.382	
	F	181	14.4	9.8-20.6	207	14.6	9.7-21.5	165	16.4	11.3-23.2	161	10.4	6.7-15.8	0.751	0.388	
Residence																
Urban	M	215	12.2	8.2-17.8	294	12.0	8.0-17.6	335	13.7	9.2-19.9	319	13.0	8.9-18.7	0.144	0.704	
	F	145	8.3	4.1-15.9	256	9.5	6.5-13.5	241	7.4	4.4-12.1	254	8.5	4.6-15.3	0.025	0.874	
Rural	M	1,665	22.6	20.1-25.2	1,286	21.2	18.7-23.9	1,544	19.7	17.2-22.6	1,570	17.1	14.5-20.1	8.309	0.004	↘
	F	1,089	18.4	15.5-21.6	1,215	16.9	14.5-19.6	1,028	13.2	10.8-16.0	1,003	13.8	11.1-17.1	6.301	0.012	↘
Maternal Education																
No education	M	331	30.7	25.0-37.2	174	31.1	22.3-41.6	244	32.1	25.1-40.0	197	27.4	21.1-34.8	0.233	0.629	
	F	220	27.0	20.3-35.0	148	27.0	19.5-36.0	168	19.2	13.5-26.7	115	22.2	13.9-33.4	1.540	0.215	
Incomplete primary	M	743	26.1	22.7-29.8	596	25.8	21.9-30.2	704	21.5	18.0-25.4	681	19.4	15.5-23.9	7.439	0.006	↘
	F	494	18.6	15.1-22.8	569	17.9	14.2-22.4	476	13.4	10.1-17.5	419	15.3	11.5-20.2	2.466	0.117	
Complete primary	M	383	16.8	13.1-21.3	395	13.8	10.7-17.7	538	15.1	11.8-19.2	590	15.5	11.4-20.6	0.034	0.854	
	F	231	11.8	7.9-17.4	384	16.1	12.6-20.4	348	12.8	8.8-18.3	376	14.2	9.8-20.1	0.023	0.880	
Incomplete secondary	M	383	10.3	7.3-14.3	152	11.0	6.5-17.9	167	13.0	7.6-21.4	164	11.0	6.4-18.3	0.239	0.625	
	F	243	11.4	7.5-16.9	139	9.4	5.3-15.9	102	4.1	1.3-12.4	115	7.1	3.7-13.3	2.837	0.093	

Table 4 Underweight trends by age, province, residence, maternal education and wealth index, KDHS *(Continued)*

Secondary +	M	42	8.6	2.4-26.4	263	10.5	6.4-16.7	227	8.1	4.9-13.1	258	6.0	3.6-9.8	2.163	0.142	
	F	46	12.8	5.2-28.2	232	5.6	3.3-9.5	175	5.0	2.5-9.6	232	3.9	1.8-8.1	2.529	0.112	
Wealth Index																
Poorest	M	419	31.7	26.3-37.5	398	30.9	25.6-36.7	457	24.1	19.3-29.6	463	24.2	19.3-29.8	5.402	0.020	↘
	F	290	22.6	17.4-28.7	353	22.0	17.6-27.1	277	18.4	13.2-25.1	271	16.9	12.4-22.6	2.718	0.100	
Poorer	M	415	25.4	20.9-30.6	317	21.6	17.5-26.3	398	20.7	15.8-26.6	424	19.7	14.6-26.0	2.204	0.138	
	F	248	20.3	15.2-26.5	317	17.6	12.8-23.7	282	12.4	8.5-17.9	251	15.9	10.5-23.3	1.788	0.182	
Middle	M	396	17.5	13.9-21.7	308	14.3	10.3-19.5	359	16.9	12.8-22.0	358	10.9	7.3-15.9	3.208	0.074	
	F	237	17.6	12.7-23.9	271	16.0	11.8-21.5	243	14.5	10.4-19.8	246	17.9	11.9-26.0	0.001	0.980	
Richer	M	367	19.3	15.2-24.2	289	17.4	12.8-23.2	329	18.1	13.9-23.2	318	13.4	8.2-21.0	1.808	0.179	
	F	241	15.2	10.5-21.5	263	11.9	7.9-17.6	223	7.8	4.3-13.6	248	7.6	3.8-14.7	4.264	0.039	↘
Richest	M	285	8.6	5.6-12.9	268	8.1	5.2-12.3	337	11.3	7.2-17.3	326	10.4	6.0-17.4	0.691	0.406	
	F	219	8.4	5.0-13.8	269	8.2	5.4-12.3	244	6.1	3.4-10.8	241	4.9	2.6-9.2	2.238	0.135	

C.I, 95% confidence intervals; Secondary +, complete secondary and higher education; ↘ significant decreasing trend.

those living in Eastern and Nyanza provinces. The favourable trends in these provinces for both girls and boys are noteworthy, since Eastern province experiences marked perennial food shortages, while Nyanza is among the provinces with the highest poverty levels in Kenya [38,39]. Climate research in the Eastern province has observed no discernible increasing or decreasing trend either in the annual or seasonal rainfall from 1960's to the present [40]. It seems unlikely that changing weather conditions might have resulted in improved local food production. In light of this, one possible explanation for the improved wasting trends is the impact of food security initiatives, such as the Kenya Special Programme [39]. However, returning to the theme that overall care may be as important as feeding care, evidence from many countries suggests the importance to child growth of policies in diverse arenas. These include immunization, safe water provision, female literacy, income distribution and support for agriculture [41]. Since it is unlikely that there is any single source within countries with expertise and information on all these features of social and political life, transdisciplinary research [42] seems essential to develop better appreciation of the factors that underpin the trends in child growth reported here.

Similar to wasting, trends in stunting at a national level remained stagnant. However, stratification by sex showed a decline among boys. The high prevalence in stunting among boys as compared to girls is in agreement with the literature on stunting in sub-Saharan Africa [11], but the improvement over time in boys, more so than in girls, is difficult to explain. Looking to family dynamics, the literature on parental sex bias in relation to child care and feeding practices is contradictory and the evidence for bias is scarce [12,13,35]. DHS data have been brought to bear on this subject, but only via indirect inferences based on parental education differences [35]. Due to data limitations, the DHS, and most other survey data for that matter, may be inadequate for direct investigations of social and psychological factors underlying sex differences in child growth. Supporting this view is Marcoux's meta study of 306 child nutrition surveys from across the developing world, of which 74 percent showed no sex differences in wasting, stunting and underweight [43]. That sex differences are difficult to detect reliably in survey research recommends against the use of the survey study design in the search for factors underlying sex differences in child growth. Mixed methods studies of cohorts, and of cases and controls, may be more illuminating.

Analyses by age showed stunting to be relatively lower in younger children and increased with age, in line with other research evidence that the prevalence of stunting increases with age [44]. The comparatively low and stable prevalence posted by children in the youngest age category (0–5 months) is likely due to stable childcare and feeding practices during the pre-weaning stage of development. Actually, in Kenya exclusive breastfeeding increased from 12.7% in 2003 to 31.9% in 2009, while early complimentary feeding at the age of 2–3 months decreased from 81% in 1993 to 32% by 2008 [7]. That stunting in this age group did not show a decline is likely due to a 'floor effect', with near lowest feasible levels of stunting already achieved by the mid-1990's.

The high levels of stunting among children above 12 months and the increasing trend in stunting among girls aged 12–23 months indicates the seriousness of stunting, which seems to manifest itself at the onset of complimentary feeding. Studies have shown that foods used to compliment breastfeeding in Kenya are of low nutritive value [45]. The most preferred porridge is made of composite flours causing negative nutrient-nutrient

Table 5 Growth and socio-demographic characteristics of the samples, KDHS

	1993		1998		2003		2008-09	
	n	%	n	%	n	%	n	%
Growth								
Wasted	249	8.4	255	8.7	216	7.2	224	7.4
Stunted	1,182	39.5	1,094	37.1	1,095	36.1	1,114	36.5
Underweight	615	19.7	537	17.6	504	16.0	471	15.0
Sex								
Male	2,020	60.1	1,647	51.4	1,930	59.4	1,917	60.0
Female	1,343	39.9	1,559	48.6	1,320	40.6	1,281	40.0
Age								
0-5 months	521	15.5	523	16.3	603	18.6	516	16.1
6-11 months	593	17.6	564	17.6	615	18.9	585	18.3
12-23 months	1,124	33.4	1,097	34.2	1,080	33.2	1,048	32.8
24-35 months	1,126	33.5	1,021	31.9	952	29.3	1,049	32.8
Province								
Nairobi	157	4.7	213	6.7	216	6.7	181	5.6
Central	390	11.6	296	9.2	357	11.0	249	7.8
Coast	310	9.2	263	8.2	290	8.9	289	9.0
Eastern	668	19.9	546	17.0	537	16.5	514	16.1
Nyanza	526	15.6	641	20.0	510	15.7	630	19.7
Rift-Valley	769	22.9	824	25.7	924	28.4	927	29.0
Western	543	16.2	423	13.2	417	12.8	408	12.8
Residence								
Urban	430	12.8	600	18.7	607	18.7	591	18.5
Rural	2,934	87.2	2,606	81.3	2,644	81.3	2,608	81.5
Maternal Education								
No education	614	18.3	339	10.6	432	13.3	318	9.9
Incomplete primary	1,320	39.2	1,221	38.1	1,209	37.2	1,115	34.9
Complete primary	665	19.8	811	25.3	914	28.1	982	30.7
Incomplete secondary	670	19.9	306	9.6	281	8.6	283	8.8
Secondary +	94	2.8	528	16.5	416	12.8	501	15.7
Wealth Index								
Poorest	762	22.7	782	24.4	752	23.1	745	23.3
Poorer	702	20.9	663	20.7	695	21.4	684	21.4
Middle	672	20.0	606	18.9	620	19.1	610	19.1
Richer	657	19.5	581	18.1	571	17.6	576	18.0
Richest	570	16.9	573	17.9	614	18.9	584	18.3

Secondary +, complete secondary and/or higher education.

interactions and also causing mal-absorption due to the child's immature gut. Such foods are also high in anti-nutrients such as phytates and tannins that bind available nutrients and thus reduce bioavailability [45]. Further research is needed to explore the possibility that the nutritive value of the food served to girls in this age segment has worsened over the study period. The significant improvement among older children, especially among girls aged 24–35 months, could be an indication of older girls responding better to nutritional interventions leading to catch up growth [36], but more research is needed to investigate this issue.

The significant improvements in stunting levels in Nairobi could be attributed to the accrued social-economic

and infrastructural advantage enjoyed in the capital region in terms of the number of health facilities and personnel, higher literacy levels and better economic performance [46]. As in the case of wasting, the improvement in stunting among boys in Nyanza province was unexpected due to its high incidence of poverty. Nevertheless, Nyanza province has witnessed an increase in literacy levels [38] and this could be one of the contributing factors to better growth, as maternal literacy is associated with reduced risk of stunting [47,48].

Higher socio-economic status is associated with better utilization of health care services, better access to food of high quality and quantity, better nutrition, improved sanitation and household possessions [49,50]. This advantage was observed in the present study, with a significant reduction in stunting observed among children in rich households but not in poor ones. The public health significance of this pattern is alarming, even though Kenya experienced a decrease in the percentage of people living in poverty. It is estimated that the number of people living below the poverty line increased from 13.4 million in 1997 to about 16.6 million in 2006 [51], increasing the number of children in poor households and at risk of stunting.

Overall, the results show that faltering child growth remains a significant public health challenge in Kenya. It is beyond the present scope to undertake an analysis of causes of faltering growth in the Kenyan context. Here, we must be content merely to point to the complexity of the causal landscape, and the need for research that goes beyond the simple descriptive analyses presented in this paper. Among the critical causes of faltering child growth are poor agricultural performance and food distribution at a macro level, and micronutrient deficiency at the level of individuals. At the macro level, there was a worrying decline in productivity in the Kenyan agricultural sector from a real growth rate of 4.4% in 1996 to −5.4% in 2008. This poor performance translates to less food for the fast-growing Kenyan population, poor economic returns as a result of a decline in agricultural export earnings, and increased unemployment due to the decrease in household farm incomes [46,50,52].

At the individual level, dietary zinc in particular is essential in bolstering immunity, protein metabolism and linear growth, and its deficiency precipitates retarded growth [49]. Bwibo and Nuemann observed that food served to Kenyan children has multiple micronutrient deficiencies, placing child at risk of poor growth regardless of the quantity of food provided by the agricultural sector [45].

This span from macro to micro level causal factors illustrates the complexity of the causal web that underlies faltering child growth, to which an array of sub-optimal childcare practices and inadequate access to health care also contribute. This complexity is signaled strongly in the present findings that compare child growth trends in urban and in rural areas. While the terms 'urban' and 'rural' are demographic concepts referring to population number and density, urban versus rural living conditions include important variation in social factors, such as rates of unemployment and illiteracy, access to health facilities, and household and community poverty level [53]. The declining trends in underweight in rural areas as compared to stagnant trends in urban areas underscore the possibility that urban areas are experiencing a decline in their perceived advantage over rural areas [54]. The high urbanization rate brought about by rural–urban migration has significantly reduced the infrastructural advantage urban areas used to enjoy, and has resulted in increased urban poverty. While hardcore poverty declined in rural areas from 34.8% in 1997 to 21.9% in 2005/06, it increased marginally in urban areas from 7.6% in 1997 to 8.3% in 2005/06 [46]. Further research on urban/rural child growth patterns should therefore be complemented by studies of changing urban and rural living conditions, so that the context of child growth is better appreciated. This should include differentiation between urban areas generally and those in capital regions such as Nairobi, which may enjoy special advantages due to proximity to central government.

Study limitations

The more data points over time the more robust the trend analysis. With just the four data points (1993, 1998, 2003 and 2008–09) available for the present analyses, we treat our findings and interpretations with due caution. However, we are not aware of any other data on child undernutrition in Kenya with more than four data points over time, and therefore consider the present effort defensible in the interest of providing the best trend estimates possible with the limited data now available.

While decomposed analysis enables detailed understanding of trends within socio-demographic groups, it results in reduction in sample size. Trends in certain groups may fail to reach statistical significance, not necessarily due to lack of changes in prevalence, but rather to limited sample size giving rise to wider confidence intervals around prevalence estimates. It is not only relatively small sample size, but also sample size variation, that may hinder comparison of trends across socio-demographic groups. For example, two sub-group trend analyses with identical prevalence estimates at four points in time may be judged statistically significant in the sub-group with a relatively large n and insignificant in the sub-group with a relatively smaller n. In surveys wherein the sampling design has not included sampling strata at the level of socio-demographic subgroups, such as the DHS, the limitations associated with variable n that were encountered in this study cannot be overcome.

An alternative to the decomposition approach (stratification) we have taken is to use multivariate analysis to control statistically for population composition changes over time, and to control for confounding and for effect modification (interactions amongst risk and protective factors). While statistically elegant, the main value of such multivariate analyses is to produce equations that predict future changes in outcome variables as a function of hypothesized changes in risk and protective factors. This approach has less utility for policy work than the decomposition approach, which produces more easily digestible information about sub-group trends. Nevertheless, it is a limitation of the present study that the multivariate relationships among the factors defining socio-demographic sub-groups have not been taken into account in the analyses of undernutrition prevalence.

Conclusions

The national trends in childhood undernutrition in Kenya showed significant declines in underweight, but trends in wasting and stunting were stagnant. Analyses disaggregated by demographic and socio-economic segments revealed some departures from the overall trends. There were more declines in wasting among girls than boys in the various socio-demographic stratifications studied, and the opposite was true for stunting, with boys posting more declining trends compared to girls. These findings support the importance of conducting trend analyses at disaggregated levels within countries, if findings are to be useful in informing public health policy and the development of better-targeted childcare interventions. Concerted efforts should be made by relevant stakeholders to reduce the stagnating trends of undernutrition, especially for stunting, which has consistently remained high in most socio-demographic segments in Kenya.

Endnotes

[a]Since the promulgation of the new constitution in 2010, provinces were renamed as regions.

[b]The KDHS is one of the MEASURE DHS projects in developing countries that collect data on important health indicators. It is a collaboration involving the Kenya National Bureau of Statistics, National AIDS Control Council, Ministry of Public Health and Sanitation, Kenya Medical Research Institute, National Coordinating Agency for Population and Development, ICF Macro, The United States Agency for International Development (USAID) and other non-governmental organizations.

Abbreviations

WI: Wealth index; KDHS: Kenya demographic and health survey; SPSS: Statistical package for the social sciences; SD: Standard deviations; WHZ: Weight-for-height Z-score; WLZ: Weight-for-length Z-score; HAZ: Height-for-age Z-score; LAZ: Length-for-age Z-score; WAZ: Weight-for-age Z-score; DHS: Demographic and health survey.

Competing interests

The authors declare that they have no competing interests.

Authors' contributions

DJM and MBM conceived the study, DJM conducted data analysis, interpretation of results and drafting of the manuscript, and MBM and KDMD revised the manuscript. All authors read and approved the final manuscript.

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Breast-, complementary and bottle-feeding practices in Kenya: stagnant trends were experienced from 1998 to 2009

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ABSTRACT

The pattern of infant and young child feeding that provides the most benefit includes being put to the breast within an hour of birth, exclusive breastfeeding for 6 months, continued breastfeeding along with complementary foods up to 2 years of age or beyond, and avoidance of any bottle-feeding. However, since there are no published data from Kenya regarding trends in these feeding practices, this research undertook time trend estimation of these feeding practices using the 1998, 2003, and 2008-2009 Kenya Demographic and Health Survey and also examined the multivariate relationships between sociodemographic factors and feeding practices with data from 2008 to 2009. Logistic regression was used to test the significance of trends and to analyze sociodemographic characteristics associated with feeding practices. There was a significant decline in early initiation of breastfeeding among children in Central and Western provinces and those residing in urban areas. Trends in exclusive breastfeeding showed significant improvement in most sociodemographic segments, whereas trends in complementary feeding and breastfeeding remained stable. Bottle-feeding significantly decreased among children aged 12 to 23 months, as well as those living in Coast, Eastern, and Rift Valley provinces. In the multivariate analysis, the province was significantly associated with feeding practices, after controlling for child's size, birth order, and parity. The stagnant (and in some cases worsening) trends in early initiation of breastfeeding and complementary feeding with breastfeeding paint a worrisome picture of breastfeeding practices in Kenya; therefore, efforts to promote the most beneficial feeding practices should be intensified.

1. Introduction

Over the years, the World Health Organization (WHO) and United Nations Children's Fund (UNICEF) have recognized breastfeeding as the most cost-effective, health-promoting, and disease-preventing strategy across the globe [1,2]. Given the overwhelming evidence of the importance of breastfeeding in reducing child mortality and morbidity, especially in developing countries, breastfeeding remains at the core of achieving millennium development goals 4 and 5 [3]. Unfortunately

Abbreviations: CI, 95% confidence interval; DHS, Demographic and Health Survey; KDHS, Kenya Demographic and Health Survey; OR, odds ratio; UNICEF, United Nations Children's Fund; WHO, World Health Organization.

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though, 1.4 million child deaths and a further 44 million disability-adjusted life years experienced in low-income and middle-income countries are attributable to suboptimal breastfeeding [4].

The benefits of breastfeeding to the health and development of the child as well as the mother have been well documented [5–9]. Research reviews have highlighted various physical, motor, cognitive, and psychosocial advantages that breast milk offers to the child [7,9]. Breast milk boosts a child's immune system through protection from infection, it is a protective factor against obesity and other adult diseases such as diabetes and hypertension, and it saves money that might be used in buying breast milk substitutes. High child malnutrition rates and poor living environments characterized by unhygienic conditions and contaminated drinking water are common in developing countries. These conditions increase the risk of child infection, thus exacerbating the negative effects of not breastfeeding [3,7,10]. Breastfeeding enhances the bond between the child and mother, a prerequisite for normal child development. Furthermore, breastfeeding mothers enjoy benefits such as reduced postpartum bleeding, early uterine involution, delayed resumption of the menstrual cycle (and hence birth spacing), reduced risks of breast and endometrial cancer, and lessened risk of bone remineralization (which in turn reduces the risk of hip fractures in older age).

The global strategy for infant and young children feeding provides the roadmap toward achieving optimal child feeding practices [2]. The Kenyan government has adopted this strategy, and breastfeeding is among 11 prioritized high-impact nutrition interventions for child survival and development [11]. Among other guidelines, it is recommended that the newborn has skin-to-skin contact with the mother and start breastfeeding within 1 hour after birth [12]. This practice helps in bonding the dyad, stimulates production of colostrum milk that has high immunological benefit to the child, and also aids contraction of the mother's womb for faster expulsion of the placenta and reduced risk of heavy bleeding. Children are expected to be exclusively breastfed for 6 months and, thereafter, receive adequate complementary foods with continued breastfeeding for 2 years or beyond. Feeding a child using a bottle with a teat is highly discouraged because it endangers the baby's health and survival through contamination and interference with breastfeeding establishment [12].

Despite improvements in breastfeeding at the national level in developing countries, there are fears of decline in certain sociodemographic segments, especially among mothers in urban areas and of higher socioeconomic status [13,14]. It is also evident that breastfeeding practices in sub-Saharan Africa vary from country to country, and within countries [14,15]. Numerous cross-sectional studies have been undertaken on breastfeeding practices in Kenya [16–18], but long-term trends are not yet documented. To fill this gap, an aim of this study was to examine trends in early initiation of breastfeeding at 0 to 23 months of age, exclusive breastfeeding at 0 to 5 months of age, complementary feeding and breastfeeding at 6 to 23 months of age, and bottle-feeding at 0 to 23 months of age, using measures and definitions recommended by WHO [19]. To provide details at the levels of subgroups and subnational areas, the trends estimations were disaggregated by child's sex, child's age, province, residence, maternal education, household wealth, maternal literacy, and media exposure.

A second aim was to examine multivariate relationships between sociodemographic factors and feeding practices with data from 2008 to 2009, the most recent available data. The health promotion conceptual model guiding this analysis is UNICEF's social-ecological model of child care, as further specified by Engle et al [20]. Child feeding practices are in focus in this analysis, as well as a critical part of a cluster of mother/child dyad care behaviors, including care for mother, child psychological and social stimulation, home hygiene practices, home health care practices, and food preparation and storage practices. To facilitate a manageable analysis, only the feeding practices "early initiation of breastfeeding," "exclusive breastfeeding the first 6 months," "complementary feeding and breastfeeding at 6 to 23 months," and "bottle feeding at 0 to 23 months" are included as endpoints. The relationships of these 4 feeding practices were examined with respect to 2 clusters of independent variables that are specified in the UNICEF model: resources for care (eg, maternal education) and contextual factors (eg, urban-rural setting). By specifying and focusing on resources for care, the analysis was guided by an unequivocal health promotion perspective, contra a disease promotion perspective, in which risk factors have a more prominent place than do protective factors.

2. Methods and materials

2.1. *Data sources*

The study used data from the Kenya Demographic and Health Survey (KDHS), which is publicly available [21]. The 1998, 2003, and 2008–2009 KDHS datasets used in this study are from nationally representative household surveys that collected data on maternal, paternal, and child demography, health, and nutrition. For each survey, the KDHS used a two-stage cluster sampling design whereby enumeration areas (clusters) were first drawn from a national master sample frame. Thereafter, a sample of households was drawn from the selected clusters using systematic sampling methods. Women aged 15 to 49 years and men aged 15 to 54 years from the sampled households were interviewed using specific questionnaires for women and men, following an enumeration of all household inhabitants. The interview questionnaires were based on model Demographic and Health Survey (DHS) questionnaires that underwent slight adjustments to reflect relevant issues in Kenya and conducted through a consultative process with technical institutions, government agencies, and local and international organizations. The number of households sampled were 8380 in 1998, 8561 in 2003, and 9057 in 2008 to 2009, with a response rate to the women's questionnaire (from which all the data used in this study were obtained) of greater than 96% in all surveys [22–24]. To enhance data quality, DHS conducted rigorous training for its data collection fieldworkers, and data management was closely supervised at all stages [25].

The 4 cross-sectional datasets from each survey year were merged into a single file to enable trend estimation. To compare the prevalence of breastfeeding practices, the study used identical questions asked across the 3 surveys. From

each household with a child aged 0 to 23 months, the data from the mother and her youngest child were used. The unweighted sample sizes were 2235 mother-child pairs in 1998, 2141 mother-child pairs in 2003, and 2125 mother-child pairs in 2008 to 2009.

2.2. Variables

Using the WHO recommendations for assessing infant and young child feeding practices [19], 2 core indicators (early initiation of breastfeeding and exclusive breastfeeding) and 2 optional indicators (age-appropriate breastfeeding and bottle-feeding) were measured. Early initiation of breastfeeding refers to the proportion of children aged 0 to 23 months who were reported by mothers to have been put to the breast within 1 hour after birth. Exclusive breastfeeding refers to the proportion of infants aged 0 to 5 months who were reported by mothers to have been fed exclusively with breast milk. Age-appropriate breastfeeding is based on mothers' reports and refers to feeding only on breast milk at ages 0 to 5 months and feeding on breast milk as well as solid, semisolid, or soft foods at ages 6 to 23 months (these 2 groups of children are presented independently in this analysis). Bottle-feeding refers to the proportion of children aged 0 to 23 months who were fed with a bottle for at least part of their feeding, also according to mothers' reports [19]. There is evidence that a mother's recall is a valid and reliable method of collecting data on feeding practices, including breastfeeding [26–28].

The analyses of trends in feeding over the 3 surveys were stratified by child's sex and age; province; residence (urban/rural); wealth quintile; and maternal education, literacy, newspaper reading, television watching, and radio listening. Child age categories were 0 to 11 and 12 to 23 months for early initiation of breastfeeding, and 0 to 5, 6 to 11, and 12 to 23 months for bottle-feeding [19]. Provincial stratification was restricted to 7 provinces: Nairobi, Central, Coast, Eastern, Nyanza, Rift Valley, and Western. The North-Eastern province was not included because data were not collected in this province during the 1998 survey. Stratification by wealth was by quintiles (richest, richer, middle, poorer, and poorest) constructed using household asset data through principal component analysis [29]. Other variables were categorized as shown in the Tables. Some information was lost in some of the categorization decisions, for example, maternal occupation, which we group in 3 categories. The standard DHS occupational classification uses 7 categories, which we collapsed into 3 categories because of very low numbers in some of the 7 categories.

2.3. Statistical analyses

Analyses were conducted using SPSS for Windows version 19. Logistic regression was used to test for linear trends (slope) in the prevalence of early initiation of breastfeeding, exclusive breastfeeding, complementary feeding and breastfeeding, and bottle-feeding. The regression equation:

$$\log(p/1–p) = \beta 0 + \beta \text{ survey year} \cdot \text{survey year}$$

was used to test the significance of the slope (the null hypothesis was that the regression coefficient β for survey year was not significantly different from zero).

To study associations between breastfeeding practices and sociodemographic variables in the most recent data available (2008–2009), bivariate analyses were conducted using either χ^2 or Student's t test, depending on a sociodemographic variable's level of measurement. Logistic regression was then used, including sociodemographic variables having significant bivariate associations ($P < .05$) with the feeding variables. Odds ratios (ORs) and 95% confidence intervals (CIs) were calculated. Because of the multistage sampling design used in the collection of data, all analyses were weighted with DHS sample weights, and the sampling design (clusters and strata) was accounted for [25].

3. Results

Characteristic of the 3 samples are shown in Table 1.

3.1. Trends in early initiation of breastfeeding, exclusive breastfeeding, complementary feeding and breastfeeding, and bottle-feeding

In the text below, the F tests are from the regression analyses for linear trend. In the analyses of early initiation of breastfeeding, there was little change for either girls or boys over the course of the study (Table 2). There was great variability between provinces in each survey year and between survey years within provinces. Beside posting the

Table 1 – Sample distribution by survey year, feeding practices, and demographic characteristics

	KDHS 1998		KDHS 2003		KDHS 2008-09	
	%	n	%	n	%	n
Feeding practices						
Early initiation of beastfeeding	54.5	1073	48.7	997	54.9	1156
Exclusive breastfeeding	16.6	71	14.6	82	38.1	173
Complementary feeding and breastfeeding	81.9	1248	83.7	1288	78.8	1245
Bottle-feeding	22.3	446	22.4	468	19.7	427
Sex						
Male	55.0	1220	62.7	1334	62.8	1342
Female	45.0	1015	37.3	807	37.2	783
Age						
0-5 mo	23.9	525	26.2	566	24.0	533
6-11 mo	25.8	583	26.8	572	27.2	595
12-23 mo	50.2	1127	47.0	1003	48.8	997
Province						
Nairobi	7.2	86	6.1	190	5.8	160
Central	9.2	188	10.7	278	7.2	166
Coast	8.2	345	9.1	287	9.8	357
Eastern	16.2	296	16.4	278	15.4	300
Nyanza	20.8	370	15.4	288	20.1	432
Rift Valley	25.4	650	29.0	495	30.2	414
Western	12.9	300	13.2	325	11.5	296
Residence						
Urban	19.9	356	18.5	533	19.9	554
Rural	80.1	1879	81.5	1608	80.1	1571
Total		2235		2141		2125

lowest prevalence in all the survey years, the Western province also experienced a significant worsening trend ($F_{1,51}$ = 5.26, P < .023). Only Nyanza province recorded a significant improving trend ($F_{1,149}$ = 25.57, P < .000). There were limited changes in prevalence stratified by maternal education, maternal literacy, and maternal media exposure, with only children born to mothers who did not listen to the radio at least once a week posting a significant improving trend ($F_{1,663}$ = 4.50, P < .034).

Trends in exclusive breastfeeding mostly improved (Table 3). Girls and boys posted significant improving trends ($F_{1,772}$ = 11.16, P < .001) and ($F_{1,772}$ = 15.35, P < .000), respectively. In addition, children in rural areas posted significant improvement ($F_{1,596}$ = 27.15, P < .000). Comparing the richest versus the poorest groups, both quintiles posted significant improving trends, but the poorest performed better than the richest with its prevalence of exclusive breastfeeding tripling from 1998 to 2008-2009 ($F_{1,213}$ = 17.96, P < .000).

There were almost no statistically significant changes in prevalence across the study period in complementary feeding and breastfeeding (Table 4). Only children born to mothers who could read with difficulty posted a significant worsening trend ($F_{1,663}$ = 4.50, P < .034).

In the analyses of bottle-feeding (Table 5), the sociodemographic pattern had mostly stable trends and only 1 worsening trend in the Western province ($F_{1,151}$ = 4.54, P < .035). Statistically significant improving trends (declines in bottle-feeding) were observed among children aged 12 to 23

Table 2 – Trends in early initiation of breastfeeding (within 1 hour) for children aged 0-23 months

	KDHS 1998		KDHS 2003		KDHS 2008-2009				
	%	95% CI	%	95% CI	%	95% CI	Grand n	P	Trend
Total	54.5	51.6-57.4	48.7	45.4-52.0	54.9	50.7-59.0	6253	.842	
Sex									
Female	53.5	49.8-57.2	52.2	48.1-56.3	53.9	48.5-59.3	2525	.924	
Male	55.4	51.6-59.1	46.6	42.9-50.2	55.5	50.9-60.0	3728	.783	
Age									
0-11 mo	54.5	50.7-58.2	47.7	43.8-51.5	53.9	49.3-58.3	3250	.909	
12-23 mo	54.6	50.7-58.4	49.8	45.8-53.9	56.0	50.3-61.5	3003	.671	
Province									
Nairobi	55.1	43.3-66.4	51.4	42.3-60.3	57.9	48.5-66.8	423	.745	
Central	69.3	61.7-76.0	59.6	53.3-65.7	46.3	39.0-53.7	621	.000	↘
Coast	45.4	37.7-53.2	18.9	12.0-28.4	31.8	21.6-44.0	934	.090	
Eastern	62.5	53.4-70.8	59.0	50.9-66.7	69.5	60.0-77.6	848	.261	
Nyanza	40.5	34.4-46.8	46.4	38.8-54.2	62.4	56.5-67.9	1055	.000	↗
Rift Valley	65.1	59.2-70.6	60.1	53.5-66.3	61.0	51.4-69.8	1492	.494	
Western	40.3	33.1-48.0	23.7	18.3-30.1	29.3	23.8-35.6	880	.023	↘
Residence									
Urban	59.5	52.9-65.7	46.4	40.7-52.2	45.6	37.3-54.2	1385	.012	↘
Rural	53.3	50.0-56.6	49.2	45.2-53.2	57.2	52.5-61.8	4868	.165	
Wealth index									
Richest	59.0	52.9-64.8	46.9	41.9-51.9	50.9	44.8-56.9	1280	.071	
Richer	60.4	54.5-66.1	53.4	47.6-59.1	55.2	45.8-64.3	1109	.370	
Middle	58.7	53.0-64.1	48.2	42.3-54.1	55.8	47.6-63.7	1146	.567	
Poorer	48.6	43.2-54.0	49.1	42.9-55.3	56.8	48.8-64.5	1256	.090	
Poorest	48.3	41.9-54.7	46.7	39.0-54.6	55.6	48.0-63.0	1462	.138	
Maternal education									
Secondary +	61.9	55.5-67.8	54.6	48.3-60.8	59.9	53.1-66.3	953	.696	
Incomplete secondary	45.5	37.2-54.1	47.0	39.1-55.1	53.5	43.3-63.4	566	.245	
Complete primary	55.6	50.3-60.7	50.1	45.9-54.4	59.2	52.3-65.7	1701	.334	
Incomplete primary	53.0	48.5-57.5	43.4	38.8-48.1	49.2	43.7-54.8	2228	.273	
No education	55.1	46.2-63.7	56.3	43.9-67.9	53.3	41.0-65.3	805	.804	
Maternal literacy									
Reads easily	53.0	49.7-56.4	47.5	44.3-50.7	55.1	50.5-59.7	4049	.385	
Reads with difficulty	56.4	50.5-62.2	50.3	41.4-59.1	60.2	51.8-68.1	923	.554	
Cannot read	57.0	49.7-64.0	51.8	43.4-60.1	48.4	39.3-57.6	1250	.145	
Mother reads newspaper									
Yes	55.7	51.4-60.0	46.2	42.4-50.1	52.9	47.5-58.2	2107	.511	
No	53.9	50.4-57.4	49.9	45.4-54.4	56.0	50.7-61.0	4134	.511	
Mother watches television									
Yes	57.1	51.4-62.7	48.8	44.4-53.3	52.7	47.1-58.2	1786	.445	
No	53.9	50.6-57.3	48.7	44.7-52.7	56.2	51.2-61.0	4447	.525	
Mother listens to radio									
Yes	57.0	53.6-60.3	57.0	53.6-60.3	47.3	44.2-50.4	4633	.645	
No	51.1	46.9-55.3	55.5	47.1-63.6	60.0	52.4-67.2	1610	.034	↗

Secondary +, complete secondary and/or higher education; ↘, significant decreasing trend; ↗, significant increasing trend based on logistic regression.

Table 3 – Trends in exclusive breastfeeding for children aged 0-5 months

	KDHS 1998		KDHS 2003		KDHS 2008-2009				
	%	95% CI	%	95% CI	%	95% CI	Grand nN	*P*	Trend
Total	16.6	13.0-21.0	14.6	11.4-18.4	38.1	32.0-44.7	1,558	.000	↗
Sex									
Female	15.9	10.8-22.8	9.6	6.0-15.1	38.7	28.5-49.9	565	.001	↗
Male	17.1	12.0-23.7	17.3	13.2-22.3	37.9	29.7-46.8	993	.000	↗
Residence									
Urban	12.9	6.6-23.6	13.5	8.2-21.4	24.8	16.9-34.9	357	.071	
Rural	17.4	13.4-22.4	14.8	11.3-19.3	40.7	33.7-48.1	1,201	.000	↗
Wealth index									
Richest	13.4	7.2-23.8	12.9	7.6-21.0	29.1	20.5-39.7	338	.026	↗
Richer	13.5	6.4-26.5	14.2	8.5-22.8	36.2	25.8-48.0	286	.008	↗
Middle	18.0	10.7-28.7	10.2	5.1-19.4	33.0	22.1-46.2	287	.056	
Poorer	21.4	13.2-32.8	11.6	6.7-19.3	31.2	19.8-45.5	294	.164	
Poorest	17.3	11.1-26.0	23.5	15.3-34.3	53.9	40.2-67.1	353	.000	↗

Secondary +, complete secondary and higher education; ↗, significant increasing trend based on logistic regression.

months ($F_{1,986} = 8.29$, $P < .004$), children in Coast ($F_{1,164} = 8.91$, $P < .003$), Eastern ($F_{1,171} = 5.30$, $P < .002$), Rift Valley ($F_{1,233} = 8.87$, $P < .003$), children whose mothers could not read ($F_{1,484} = 5.24$, $P < .023$), and those whose mothers listened to radio weekly ($F_{1,1034} = 4.77$, $P < .029$).

3.2. *Associations between sociodemographic variables and breastfeeding practices in 2008-2009*

Bivariate analyses with 2008-2009 data were used to select independent variables for inclusion in logistic regression analyses (Table 6). Only province and area of residence had significant bivariate associations with all 4 feeding variables. Table 7 shows the results of logistic regression analyses with only variables that showed significant bivariate association with individual breastfeeding practices put in the regression models.

In model 1 (early initiation of breastfeeding), children born through cesarean delivery were almost 3 times more likely to be breastfed later than 1 hour after birth, compared to children having vaginal deliveries. Children in Western, Central, and Coast provinces had significantly higher odds of being breastfed later as compared to children in the Eastern province. Children born to mothers with incomplete primary education were more likely to be breastfed later than earlier, compared to those born to mothers who had completed secondary and/or higher education.

In model 2 (exclusive breastfeeding), children born through cesarean delivery were more likely to be exclusively breastfed compared to those with vaginal deliveries. Using the Eastern province as the reference category, children in the Coast and Nairobi were more likely to not be exclusively breastfed.

In model 3 (complementary feeding and breastfeeding), only the child's age was a significant predictor, with an increase in child's age increasing the odds of not receiving complementary food and breastfeeding.

In model 4 (bottle-feeding), the child's age and province were the only 2 variables that made significant contributions to the model. An increase in child's age was negatively correlated with bottle-feeding, whereas the odds of children in Nairobi being fed using a bottle was higher as compared to children in the Eastern province.

4. Discussion

This study set out to investigate trends in breastfeeding practices in Kenya using 3 surveys conducted in 1998, 2003, and 2008-2009. The study also conducted a multivariate analysis on the predictors of breastfeeding practices using the 2008-2009 survey. To summarize the main results, the trends in exclusive breastfeeding showed mostly significant improvement, although the starting point in 1998 was low (ranging from 13% to 21% in the various sociodemographic groups studied). The most dramatic improvement was for children in the poorest wealth quintile, with exclusive breastfeeding more than tripling at 54% in 2008-2009. We speculate that the breastfeeding health education efforts and campaigns in Kenya, referred to in the Introduction, may have had a real impact at all sociodemographic levels, but this cannot be confirmed by the limited data available in this study.

Conversely, the trends in early initiation of breastfeeding, complementary feeding and breastfeeding, and bottle-feeding were stagnant or slightly worsened in most of the sociodemographic groups studied. Although these trends are not encouraging, efforts to promote breastfeeding in Kenya may have averted what otherwise might have been strongly worsening trends. This is conjectural, however, since there is no way to know what might have happened in the absence of the breastfeeding education efforts that have been made.

Logistic regression models using the 2008-2009 data showed that accounting for other variables, the province where the mother resided was the most significant predictor of early initiation of breastfeeding, exclusive breastfeeding, and bottle-feeding. This raises the question, what is it about one's province of residence that might affect child feeding? Three factors may be important in this regard: governmental and nongovernmental health organizations that foster child health, regional living conditions, and culture with its myriad of local expressions [18,30–34].

Turning first to health organizations, the Kenyan government has undertaken a number of initiatives including implementation of the joint WHO/UNICEF principles on a global strategy for infant and young child feeding through the

Table 4 – Trends in complementary feeding and breastfeeding for children aged 6-23 months

	KDHS 1998		KDHS 2003		KDHS 2008-2009				
	%	95% CI	%	95% CI	%	95% CI	Grand n	*P*	Trend
Total	81.9	79.8-83.8	83.7	81.3-85.9	78.8	75.7-81.5	4657	.075	
Sex									
Female	80.9	77.6-83.7	83.0	79.1-86.2	77.9	72.6-82.5	1952	.338	
Male	82.9	79.8-85.6	84.2	81.2-86.8	79.3	75.4-82.7	2705	.107	
Province									
Nairobi	70.2	63.1-76.4	75.2	65.3-83.0	63.1	53.1-72.1	302	.267	
Central	79.0	70.9-85.3	75.2	69.8-79.9	81.0	72.7-87.1	449	.745	
Coast	79.0	69.5-86.1	86.5	80.6-90.8	79.8	70.4-86.7	702	.998	
Eastern	89.4	84.5-92.8	94.2	90.7-96.5	86.5	79.9-91.1	630	.410	
Nyanza	82.9	78.0-86.8	83.9	76.1-89.5	77.0	71.9-81.4	774	.083	
Rift Valley	80.1	75.7-83.8	81.5	75.9-86.1	78.2	70.4-84.3	1142	.616	
Western	85.2	80.0-89.2	84.3	77.6-89.2	78.7	68.7-86.1	658	.176	
Residence									
Urban	74.3	68.6-79.3	78.1	71.3-83.6	70.5	66.3-74.3	1029	.232	
Rural	83.7	81.4-85.7	85.0	82.4-87.3	81.0	77.4-84.1	3628	.168	
Wealth index									
Richest	70.4	64.6-75.6	77.1	70.3-82.7	70.5	65.0-75.5	935	.911	
Richer	84.1	78.8-88.2	81.9	76.5-86.3	81.6	74.1-87.4	813	.558	
Middle	82.9	77.9-86.9	82.1	76.5-86.6	81.0	74.1-86.4	850	.629	
Poorer	83.5	78.6-87.4	87.1	82.0-90.9	79.5	72.8-84.9	960	.300	
Poorest	86.7	83.0-89.6	88.5	84.4-91.7	81.4	76.1-85.8	1099	.072	
Maternal education									
Secondary +	75.4	68.0-81.4	73.3	65.6-79.8	71.8	63.4-78.8	690	.494	
Incomplete secondary	77.5	69.9-83.7	78.9	70.7-85.4	77.0	67.0-84.7	419	.937	
Complete primary	84.8	80.5-88.3	87.0	83.1-90.1	81.2	76.2-85.4	1281	.200	
Incomplete primary	82.3	78.8-85.3	84.8	80.9-88.1	79.0	73.0-83.9	1665	.313	
No education	86.8	79.5-91.8	87.1	80.1-91.9	83.0	74.8-88.9	602	.418	
Maternal literacy									
Reads easily	79.9	77.0-82.6	83.2	80.3-85.7	78.2	74.8-81.3	2985	.361	
Reads with difficulty	83.8	79.2-87.7	81.6	73.2-87.9	74.6	67.1-80.8	715	.022	↘
Cannot read	86.6	81.0-90.8	86.2	81.0-90.1	85.3	79.0-89.9	934	.717	
Mother reads newspaper									
Yes	76.7	72.3-80.5	82.2	78.3-85.5	75.9	71.0-80.2	1548	.710	
No	84.5	81.9-86.7	84.6	81.7-87.1	80.4	76.6-83.6	3101	.055	
Mother watches television									
Yes	72.7	67.3-77.6	80.4	75.9-84.2	76.5	72.0-80.6	1336	.484	
No	84.4	82.2-86.4	85.0	82.3-87.4	80.1	75.7-83.9	3307	.063	
Mother listens to radio									
Yes	80.2	77.1-83.0	83.2	80.5-85.6	78.1	74.6-81.3	3415	.213	
No	83.9	80.7-86.7	86.4	80.8-90.6	82.5	76.4-87.3	1236	.872	

Secondary +, complete secondary and higher education; ↘, significant decreasing trend based on logistic regression.

Baby Friendly Hospital Initiative and recent passing of a law regulating breast milk substitutes [35,36]. The encouraging trends in exclusive breastfeeding with significant increases in most sociodemographic groups could be an indicator of the impact of such initiatives. Nonetheless, it also raises the question of whether a focus on exclusive breastfeeding has overshadowed messages about the importance of feeding colostrum within an hour after birth, continued breastfeeding after complementary foods are introduced, and avoiding feeding children using bottles and teats. With regard to health facility deliveries, 76% of mothers in Kenya who delivered at a health facility were successfully aided in breastfeeding their babies within an hour after birth, but such health facility deliveries account for just 43% of all deliveries [11]. Mothers delivering at a health facility are likely to get counseled by health workers on the importance of early initiation of breastfeeding, contrary to those giving birth at home [37]. Concerning the mode of delivery and consistent with other studies [38,39], children who were born through cesarean delivery instead of vaginal birth were not likely to be breastfed within an hour of birth, even though they were likely to be exclusively breastfed. Obstetric complications and the use of analgesics during cesarean deliveries are significant barriers to immediate initiation of breastfeeding [40].

The availability and use of health facilities for child birth play some role in early child care, including feeding practices. Yet incongruities exist, for example, in the Central province, which has relatively good health care facilities available, there are still worsening trends in early initiation of breastfeeding [41]. This leads to consideration of living conditions and culture.

Health behavior is influenced strongly by living conditions, cultural beliefs, and practices. Both living conditions and culture beliefs help explain, for example, why some mothers in developing countries opt to feed their newborn children

Table 5 – Trends in bottle-feeding for children aged 0-23 months

	KDHS 1998		KDHS 2003		KDHS 2008-2009				
	%	95% CI	%	95% CI	%	95% CI	Grand n	P	Trend
Total	22.3	20.1-24.7	22.4	19.9-25.1	19.7	17.1-22.4	6268	.135	
Sex									
Girls	23.5	20.2-27.2	24.2	20.5-28.4	19.2	15.4-23.8	2531	.144	
Boys	21.3	18.5-24.3	21.3	18.5-24.3	21.3	18.5-24.5	3737	.513	
Age									
0-5 mo	25.3	21.2-29.8	27.4	23.2-32.1	25.3	20.6-30.7	1568	.997	
6-11 mo	27.1	22.4-32.4	28.4	24.3-33.0	28.1	23.5-33.1	1683	.794	
12-23 mo	18.5	15.6-21.8	16.2	13.4-19.4	12.1	9.5-15.3	3017	.004	↘
Province									
Nairobi	29.3	19.7-41.3	35.8	28.7-43.5	44.0	31.4-57.5	424	.103	
Central	25.8	18.9-34.2	24.3	19.4-29.9	28.5	21.1-37.3	622	.680	
Coast	37.9	32.2-44.0	12.8	8.4-19.0	21.3	15.6-28.4	944	.003	↘
Eastern	25.8	19.9-32.8	17.3	12.3-23.7	15.8	11.2-21.9	845	.022	↘
Nyanza	14.6	10.8-19.5	23.3	17.4-30.4	21.4	16.5-27.3	1056	.062	
Rift Valley	26.0	22.0-30.4	29.5	24.2-35.5	15.6	11.1-21.4	1497	.003	↘
Western	6.6	3.6-11.5	11.0	7.2-16.3	13.2	9.3-18.3	880	.035	↗
Residence									
Urban	30.9	24.9-37.6	31.8	26.5-37.6	27.8	20.2-36.9	1387	.552	
Rural	20.3	18.0-22.8	20.3	17.5-23.3	17.6	15.1-20.5	4881	.139	
Wealth index									
Richest	35.0	29.2-41.3	32.0	26.7-37.7	26.0	18.7-35.0	1280	.091	
Richer	26.8	21.1-33.3	27.0	21.6-33.2	22.4	17.7-27.9	1109	.260	
Middle	19.4	15.3-24.2	17.4	13.5-22.0	19.4	14.6-25.1	1151	.998	
Poorer	16.6	13.4-20.4	19.3	14.5-25.3	16.9	12.4-22.5	1258	.940	
Poorest	16.7	13.3-20.8	18.2	13.8-23.5	14.7	11.3-18.8	1470	.436	
Maternal education									
Secondary +	31.8	26.5-37.7	33.0	27.0-39.7	23.7	18.2-30.3	956	.056	
Incomplete secondary	25.7	18.6-34.3	23.7	16.9-32.1	27.1	18.6-37.5	566	.836	
Complete primary	17.6	14.3-21.5	22.6	18.5-27.2	19.1	15.3-23.5	1702	.714	
Incomplete primary	20.2	17.2-23.5	17.7	14.3-21.6	16.9	13.5-20.9	2236	.177	
No education	23.9	17.9-31.1	24.6	19.6-30.5	17.5	11.5-25.9	808	.189	
Maternal literacy									
Reads easily	23.8	20.9-26.9	23.7	20.8-26.9	20.8	17.6-24.4	4056	.187	
Reads with difficulty	18.7	14.9-23.3	13.3	8.1-21.2	20.1	14.8-26.6	926	.829	
Cannot read	22.5	17.6-28.4	21.9	17.9-26.6	14.0	9.6-20.0	1254	.023	↘
Mother reads newspaper									
Yes	27.4	23.5-31.7	27.0	23.0-31.3	22.7	18.0-28.3	2110	.162	
No	19.9	17.4-22.7	20.1	17.4-23.1	17.9	15.3-20.9	4146	.300	
Mother watches television									
Yes	29.6	24.7-35.0	30.0	25.9-34.5	23.9	19.4-29.2	1791	.084	
No	20.3	17.9-22.9	19.6	16.9-22.5	17.2	14.3-20.5	4457	.130	
Mother listens to radio									
Yes	24.9	21.9-28.2	23.2	20.5-26.2	20.2	17.5-23.3	4643	.029	↘
No	19.1	16.2-22.3	18.4	13.9-24.0	16.5	11.8-22.5	1615	.437	

Secondary +, complete secondary and higher education; ↘, significant decreasing trend; ↗, significant increasing trend.

water, sugar, and honey rather than the immediately and freely available colostrum [32]. In this study, living conditions and culture may be the most palpable explanation of barriers to feeding children as recommended by health experts [18,30,31]. Suggestions for this come from a highly informative qualitative assessment of beliefs and attitudes regarding infant and young child feeding undertaken in Kenya [42]. Among the key findings, women were generally aware of the benefits of breastfeeding but had to cope with maternal workload (including employment outside the home) and family demands, cultural beliefs about when and what to feed their children, worries about breastfeeding's effects on a woman's physical appearance, stigmas associating exclusive breastfeeding with the prevention of HIV transmission, and lack of social support for optimal breastfeeding practices.

This complex array of barriers to health-promoting child feeding practices has significance for understanding the most robust finding of this study. There exist important differences from region to region in feeding practices (Tables 2–5), and there are different regional patterns for the 4 feeding practices that were studied (Table 7). The aforementioned assessment of beliefs and attitudes [42] included an analysis that revealed regional differences in the significance of many feeding barriers, as perceived by mothers, fathers, grandmothers, community health workers, traditional birth attendants, nurses, women's leaders, and nongovernment organization

Table 6 – Bivariate analysis between early initiation of breastfeeding, exclusive breastfeeding, complementary feeding and breastfeeding, and bottle-feeding with predictor variables, KDHS 2008-2009

	Early initiation of breastfeeding		Exclusive breastfeeding		Complementary feeding and breastfeeding		Bottle-feeding	
Variable	χ^2	P	χ^2	P	χ^2	P	χ^2	P
Gender	0.50	.479	0.01	.905	0.42	.519	0.14	.704
Child's mode of delivery	29.58	.000	12.00	.001	1.07	.301	0.98	.323
Child's size at birth	20.74	.000	1.35	.510	3.08	.215	6.71	.035
Child's place of birth	2.71	.099	0.08	.779	5.95	.015	18.23	.000
Province	162.46	.000	22.66	.001	23.13	.001	71.25	.000
Residence	18.33	.000	6.99	.008	18.19	.000	22.14	.000
Wealth index	3.59	.464	20.33	.000	17.14	.002	22.65	.000
Maternal education	18.09	.001	7.95	.094	11.12	.025	14.98	.005
Maternal occupation	11.03	.004	1.07	.587	9.15	.010	0.40	.818
Maternal literacy	9.14	.010	2.38	.305	9.38	.009	8.54	.014
Maternal newspaper reading	1.87	.171	12.08	.001	4.45	.035	7.22	.007
Maternal television watching	2.41	.121	5.45	.020	2.88	.090	14.21	.000
Maternal radio listening	3.95	.047	1.81	.178	2.21	.137	2.29	.130
	F	P	F	P	F	P	F	P
Child's age	5.82	.199	0.05	.000	5.09	.000	61.24	.000
Mother's age	2.23	.000	0.03	.254	12.29	.018	14.45	.000
Birth order	1.51	.000	0.34	.758	7.62	.000	37.26	.000
No. children aged ≤5 years	11.62	.704	0.08	.406	1.49	.006	0.98	.147
Parity	0.08	.000	1.68	.566	10.07	.000	51.17	.000

representatives. In Nairobi, social support at social gatherings (eg, church), slum dwelling, and abandonment by the father were mentioned. In the Western province, family size, beliefs about the "evil eye," isolation of mothers with twins, and marital conflict were cited. In the Rift Valley, drought impacts and grandmothers' control were pointed out. In Nyanza, domestic abuse was mentioned. In the Eastern province, maternal promiscuity and the mother's age were of significance. In the Coast province, overburdening social roles and low literacy levels were named. In the Central province, a spillover effect of HIV and religious influence was cited. Some of these factors (among many others that were mentioned) were ubiquitous across the provinces, whereas others were more localized.

This analysis points to a limitation and a strength of a quantitative method such as used by the DHS, in which contextual factors are accounted for "merely" by gross proxy measures such as region of residence, urban/rural location, religion, or ethnicity. Although the limitation is obvious, perhaps less so is the advantage. The present analysis confirms that "something" about the regional contexts of Kenya is important in determining the feeding experiences of infants, and that "something" is likely an array of many factors whose expression varies from place to place. This reinforces the intuition that infant feeding is a "local" phenomenon, and that public health action to address feeding inadequacy requires local anchoring, which national campaigns do not necessarily achieve.

Several limitations deserve attention. To enable comparison of prevalence in exclusive breastfeeding and complementary feeding and breastfeeding, this study used a subset of DHS feeding questions that were the same across the 3 surveys. The later surveys included additional questions on feeding that were not used. It is also important to note that children excluded due to lack of feeding data are those who did not sleep in the household the night before the interview, who did not have valid dates of birth and valid measures of height and weight, and those whose mothers were not interviewed. For example the Child Record for the DHS 2008 survey lists 6079 children under five, of which 5706 had valid dates of birth, and of which 5450 had valid height and weight measurements (89.7%).

Also important is the issue of sample size and the effects that varying sample sizes have on statistical tests of linear trends, as reported in Tables 2 to 5. The sensitivity of statistical testing to sample size is such that 2 trends based on identical prevalence estimates may be statistically significant in the 1 case and not in the other. We know of no method to overcome this problem except to select samples of equal size, which was not a feature of the DHS sampling design. One may also question if the subgroup sample sizes are large enough. This is an important and relevant question when planning a study and when the magnitude of the effect one wishes to detect is specified. Then, sample size may be adjusted to achieve a certain level of statistical power, conventionally 0.80 or greater. However, the KDHS was not designed with such considerations in mind, and sample sizes were determined on the basis of the wish to produce nationally representative samples and with practical data collection limitations in mind. This points to an important limitation of this study, as it is now fairly well established that post-study (post hoc) power calculations to aid in the interpretation of results should be avoided [43–45]. The post hoc analyses in this article, also called *data snooping*[46], are perhaps best evaluated in terms of confidence intervals and not *P* values: "…the breadth of the interval tells us how confident we can be of the true state of nature being close to the null. Once we have constructed a confidence interval, power calculations yield no

Table 7 – Logistic regression with initiation of breastfeeding within 1 hour of birth, exclusive breastfeeding, complementary feeding and breastfeeding, and bottle-feeding as the dependent variables, KDHS 2008-2009

	Model 1: early initiation of breastfeeding			Model 2: exclusive breastfeeding			Model 3: complementary feeding and breastfeeding			Model 4: bottle-feeding		
Variables	Significance of Wald	OR	95% CI	Sig. of Wald	OR	95% CI	Sig. of Wald	OR	95% CI	Sig. of Wald	OR	95% CI
Child's age				0.000	1.50	1.27-1.77	0.000	1.20	1.14-1.26	0.000	0.93	0.91-0.95
Mode of delivery	.000			0.001								
Vaginal (reference)												
Cesarean		2.88	1.79-4.64		0.22	0.09-0.52						
Child's size at birth	.009									0.391		
Large (reference)												
Average		0.75	0.56-1.00								0.79	0.56-1.11
Small		1.22	0.83-1.79								0.91	0.57-1.47
Child's birth order	.740	0.96	0.74-1.23				0.870	1.03	0.70-1.52	0.962	0.99	0.73-1.35
Child's place of birth							0.396			0.497		
Health facility (reference)												
Home								0.81	0.50-1.32		0.88	0.62-1.27
Province	.000			0.006			0.197			0.025		
Eastern (reference)												
Nyanza		1.36	0.82-2.25		2.02	0.82-4.96		2.05	1.05-4.02		1.30	0.78-2.16
Western		6.06	3.60-10.20		1.70	0.59-4.89		1.85	0.83-4.11		0.77	0.42-1.41
Central		2.47	1.44-4.25		2.70	0.86-8.49		1.44	0.67-3.09		1.66	0.93-2.97
Rift Valley		1.60	0.87-2.93		2.14	0.85-5.39		1.73	0.81-3.69		1.02	0.57-1.82
Nairobi		1.35	0.66-2.77		4.91	1.33-18.09		3.22	1.31-7.93		3.08	1.34-7.12
Coast		4.43	2.29-8.59		6.25	2.49-15.71		1.81	0.83-3.95		1.39	0.80-2.43
Residence	.092			0.422			0.344			0.471		
Urban (reference)												
Rural		0.64	0.38-1.08		0.70	0.30-1.67		0.75	0.40-1.37		0.81	0.45-1.45
Wealth index				0.039			0.894			0.273		
Richest quintile (reference)												
Richer quintile					1.42	0.64-3.16		1.02	0.49-2.12		1.39	0.76-2.54
Middle quintile					1.64	0.61-4.42		1.31	0.60-2.83		1.48	0.73-3.01
Poorer quintile					2.52	0.94-6.73		1.38	0.58-3.30		1.30	0.59-2.85
Poorest quintile					0.72	0.25-2.09		1.32	0.55-3.16		1.00	0.47-2.13
Maternal education	.004						0.585			0.726		
Secondary + (reference)												
Incomplete secondary		1.19	0.66-2.12					0.93	0.43-1.98		1.36	0.78-2.37
Complete primary		1.29	0.80-2.08					0.82	0.47-1.43		1.02	0.65-1.61
Incomplete primary		2.15	1.34-3.45					1.03	0.45-2.37		1.12	0.63-1.99
No education		1.70	0.77-3.75					1.67	0.46-6.00		1.49	0.59-3.77
Maternal occupation	.090						0.283					
White collar (reference)												
Blue collar		1.54	1.03-2.31					0.96	0.62-1.48			
Not working		1.55	1.01-2.36					1.37	0.88-2.13			
Maternal literacy	.082						0.050			0.273		
Reads easily (reference)												
Reads with difficulty		0.66	0.42-1.06					1.24	0.76-2.03		1.24	0.72-2.11
Cannot read		1.18	0.74-1.88					0.47	0.22-1.03		0.73	0.40-1.32
No. children aged <5 y							0.436	1.10	0.86-1.41			
Mother's age	.879	1.00	0.96-1.03				0.523	1.02	0.96-1.08	0.897	1.00	0.96-1.04
Parity	.767	0.96	0.73-1.26				0.349	0.83	0.56-1.23	0.576	0.92	0.67-1.25
Mother reads newspaper weekly				0.042			0.813			0.943		
Yes (reference)												
No					0.54	0.30-0.98		1.05	0.71-1.54		1.01	0.70-1.46
Mother watches TV weekly				0.465						0.222		
Yes (reference)												
No					0.80	0.44-1.45					0.78	0.52-1.16
Mother listens to radio weekly	.028											
Yes (reference)												
No		0.65	0.44-0.96									

Secondary +, completed secondary and/or higher education; TV, television.

additional insights" [44]. Our position is that the sample sizes are what they are, our confidence in our interpretation of the data varies in part as a function of sample sizes, and our level of confidence is reflected in a conventional way, in the reported confidence intervals. A DHS study with larger or smaller samples sizes would have come to some different conclusions. Here, we are limited to reporting the findings with the data that are actually available.

In conclusion, long-term trends in exclusive breastfeeding are improving, whereas trends in early initiation of breastfeeding, complementary feeding and breastfeeding, and bottle-feeding are mostly stagnant. The province where the mother resided was a significant predictor of early initiation of breastfeeding, exclusive breastfeeding, and bottle-feeding. Since 2009, numerous child feeding education initiatives have been carried out in Kenya. The present findings suggest that such initiatives, which emphasize the importance of exclusive breastfeeding in the first half year of life, should not overlook education that focuses on the vital importance of feeding colostrum, continued breastfeeding up to 2 years of age or beyond, and the avoidance of bottle-feeding when stringent hygiene cannot be practiced due to lack of resources and unhygienic conditions. The results of this study also point to the importance of research to develop a better understanding of how local contexts influence child care and feeding practices. Large-scale survey research is definitely needed to continue to monitor national and regional trends, but in tandem with small-scale qualitative and mixed-methods research, to better inform interventions that are sensitive, respectful, and responsive to local living conditions and culture.

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III

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Reliability of demographic and socioeconomic variables in predicting early initiation of breastfeeding: a replication analysis using the Kenya Demographic and Health Survey data

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ABSTRACT

Objectives: Examine the reliability of sociodemographic variables in predicting initiation of breastfeeding within an hour of birth (EarlyBF), using data from 1998, 2003 and 2008–2009.

Study design: A replication analysis using the Kenya Demographic and Health Survey (KDHS) data collected in 1998, 2003 and 2008–2009. The candidate predictor variables were child's gender, home or health facility place of birth, vaginal or caesarean mode of birth, urban or rural setting, province of residence, Wealth Index and maternal education, occupation, literacy and media exposure.

Setting: Kenya.

Participants: 6375 dyads of mothers aged 15–49 and their children aged 0–23 months (2125 dyads in each of the survey years).

Results: Mode of birth and province were statistically significant predictors of EarlyBF in 1998, 2003 and 2008–2009. Children delivered through caesarean section were non-EarlyBF in 1998 (OR 2.63, 95% CI 1.72 to 4.04), 2003 (OR 3.36, 95% CI 1.83 to 6.16) and 2008 (OR 3.51, 95% CI 2.17 to 5.69). The same was true of those living in the Western province in 1998 (OR 2.67, 95% CI 1.61 to 4.43), 2003 (OR 4.92, 95% CI 3.01 to 8.04) and 2008 (OR 6.07, 95% CI 3.54 to 10.39).

Conclusions: The 1998 KDHS data do not provide the basis for reliable prediction of EarlyBF, with reliability conceptualised as replicability of findings using highly similar data sets from 2003 and 2008–2009. Most of the demographic and socioeconomic variables were unreliable predictors of EarlyBF. We speculate that activities in parts or all of Kenya changed the analysis context in the period between 1998 and 2008–2009, and these changes were of a sufficient magnitude to affect the relationships under investigation. The degree to which this is a general problem in child health research is not known, calling for further research to investigate this methodological issue with other health end points and other data.

Strengths and limitations of this study

- The usage of highly comparable nationally representative data from three time periods to study the reliability of sociodemographic variables in predicting the timing of initial breastfeeding after birth.
- The elimination of most method-related explanations to explain lack of reliability in the findings.
- The data available do not include possibly reliable predictors including measures of maternal childcare knowledge, attitudes, beliefs and values.

INTRODUCTION

Researchers and policymakers need reliable statistical models that describe the relationship of possible risk and protective factors to child feeding end points such as early initiation of breastfeeding (EarlyBF). A statistical model showing significant associations is reliable if it can be replicated with data other than the original data that were used to generate the model. A reliable model increases one's confidence in hypothesised risk and protective factors generated by observational research. A reliable model does not permit conclusions about causal relationships, but it does add impetus to further research to test hypotheses rigorously. The development of reliable models in which the early initiation of child breastfeeding (BF) is in focus is imperative, because this feeding behaviour has such profound consequences for the mother's and child's health. Yet the investigation of the reliability of statistical models is hampered by methodological problems and by the funders' and researchers' reluctance to invest money and effort in 'mere' replication research. This paper explains why this type of research is imperative and should have a high priority. We show how it can be carried out efficiently and cost effectively, using existing data on child health that are freely available to interested researchers.

Early initiation of BF

Among the highly recommended optimal infant and young child feeding practices is EarlyBF in accordance with which newborns should be put to breast within an hour of birth.[1 2] Kenya is a signatory to this recommendation and has made efforts towards its actualisation.[3] Nonetheless, over 40% of children in Kenya do not receive EarlyBF,[4] making late initiation of BF an issue of significant public health concern. The failure to practise EarlyBF not only endangers the health and development of the newborns, but also the mother's health may be compromised, and mother–child bonding may be suboptimal.[5 6] The multifaceted benefits of EarlyBF are so important, and the practice of early BF is so practical to implement, that EarlyBF is one of the most fundamental behaviours promoting child and maternal health. It is among the relatively few childcare behaviours that require no special training, equipment or facilities and in practice could be universal.[7]

The biomedical and psychosocial mechanisms linking EarlyBF to child health include the transmission of colostrum constituents, which are vital in boosting the neonate's immunity system. Colostrum contains antibodies that are transferred from the mother's mammary glands to the newborn's intestinal mucosa, exposing it to microbes that limit bacterial infection.[8] The protective effect of colostrum works against common neonatal respiratory infections, otitis media and diarrhoea that are the major causes of childhood morbidity and mortality, especially in the developing world.[9] EarlyBF also stimulates mother–infant bonding and makes a significant contribution to the cognitive development of the child.[6]

The skin-to-skin contact and suckling is understood to lessen the birth stress experienced by children and modulates the child's temperature, helping to prevent hypothermia and hypoglycaemia which can endanger the neonate's survival in the first week of life.[10 11] This early contact, either through suckling of the breast or hand massage by the newborn, has benefits to the mother as it causes uterine involution, which in turn reduces postpartum haemorrhage, aids expulsion of the placenta and triggers early milk let-down.[12 13] It is estimated that EarlyBF could reduce neonatal mortality by up to 22%.[14] EarlyBF has also been linked to successful practice of other optimal BF behaviours, such as exclusive BF for 6 months, and longer BF duration after complementary foods are introduced.[6 14 15]

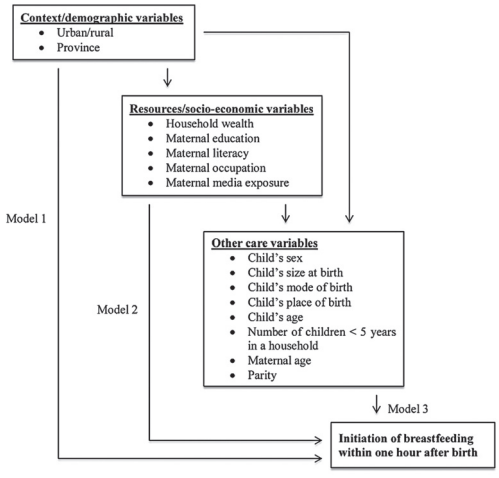

Figure 1 Analytical framework based on the UNICEF model (as extended by Engle *et al*[23]) for hierarchical regression analyses.

It may seem a puzzle why humans do not practise EarlyBF universally, as other BF mammals do. At least part of the answer is that the human instinct to breastfeed is tempered by social forces. The female breast is not just a milk delivery mechanism; "in the eyes of the beholder, babies see food, men see sex, physicians see disease, business sees dollar signs, religion sees spiritual symbols and psychoanalysis places them in the centre of the unconscious".[16] This clever citation makes a point that is captured more sombrely by a prominent health promotion model advanced by UNICEF more than two decades ago, as depicted in an adapted version in figure 1. Two main points are: (1) the chain of factors that influence childcare has origins in macrocontextual factors far removed from the control of mothers and their significant others and (2) the link between context and childcare is mediated by a host of maternal, household and community resources which may be more or less available. In child health research, the factors in the model have been operationalised in many ways. Using data from the Demographic and Health Surveys (DHS; which are not, however, intended primarily to test and develop a model), it is possible to specify variables at each level of the model, as shown in figure 1. The model is hierarchical; it is possible to conduct multivariate analyses hierarchically and to model the variance in childcare that is accounted for by the model's operationalised constructs. An array of studies have looked at the determinants of various optimal BF practices,[15 17–22] but we are not aware of any that has looked at the reliability of these determinants over time.

Analysis framework

The analytical framework for the models presented in this paper is an extended UNICEF model by Engle *et al*[23] and Victora *et al*,[24] further adapted and specified for this study as shown in figure 1. The limited aim of figure 1 is to organise the investigation of EarlyBF with attention to the possible predictor variables at several levels. The most distal level is the social, cultural, political and economic context, presented in the current analysis by just two indicators, urban/rural living conditions and province of residence. The intermediate level is household and household member resources, represented by several classical measures including household wealth and maternal education. The proximal level focuses on

intrahousehold and community factors that may affect a mother's/family's ability to provide EarlyBF, such as mode and place of birth. For example, a vaginal home birth may be attended primarily by female relatives whose ideas about EarlyBF may have a powerful influence on a mother's behaviour, contra perhaps to what might be experienced in a hospital birth. The paths in figure 1 theorise partial mediation, an alternative to the original UNICEF model which is a fully mediated model. However, the UNICEF model is more of a conceptual framework than an analytical framework. There is no evidence in the literature as far as we are aware, nor any formally held theoretical position, that the distal, intermediate and proximal factors linked to child health are connected in a fully mediated manner. It is an empirical question if this is so, and tests of the three models are needed to provide evidence on the matter.

This health promotion framework is distinct from health behaviour change models that focus on psychological factors related to behaviour change, such as the Theory of Reasoned Action or the Health Belief Model. The extended UNICEF conceptual framework focuses both on macro contextual factors and on the resources needed to support good childcare, leading to good child health. The type of care given to a child (EarlyBF) is subject to availability and accessibility of resources at a household level and the support accorded to the caregiver at the family and community levels. Thus, the overarching framework for this study places emphasis on health promotion and resources for health, rather than on disease prevention and a risk factor orientation.

Replication analysis

Replication analysis is a form of scientific validation that examines the reliability of statistical models across data sets.[25] It provides a means of distinguishing the effect of sampling differences from (1) measurement variation and/or (2) statistical model instability, by attempting the replication of an analysis of a common set of measures across different samples of known characteristics. The replication analysis confirms the robustness of the relationships in a statistical model developed with one data set by testing the model with other data sets. In survey research, the general form of this type of analysis is termed 'retest replication', the distinguishing feature of which is to repeat an original study with few if any significant changes in the research design.[26] In Lindsay and Ehrenberg's[27] theory of replication, the general form of this analysis is a 'close replication', compared to a 'differentiated replication', which extends the range of conditions being studied. In Tsang and Kwan's[28] replication typology, this form of analysis is labelled 'empirical generalisation', the use of the same measurement and analysis with data from different populations. This is distinct from replication analysis in which cross-validation, jack-knife and bootstrap methods can be used to examine replicability when only one sample is available.[29]

Replication analysis is rarely undertaken, even if replicability is in the abstract a highly regarded quality criterion in the positivist tradition.[30] Studies of replicability are not in fact prioritised and they have always been difficult to publish across the wide range of social sciences that contribute to public health research.[27 31 32] At the statistical level, researchers are encouraged to focus on the analysis of a single study, not the coordinated analysis of multiple data sets with the aim of studying replicability.[27] This is not to be confused with meta-analysis, which analyses effects across similar studies that were not undertaken with replication as a main goal. When the study of replicability is a goal, it is difficult to undertake. Most research reports do not contain enough information to allow high fidelity replication, and studies of the same phenomena often measure constructs in different ways. Measurement variation can have many causes, among the most obvious of which are differences in how the measurement of a construct is operationalised. Measurement variation complicates not only replication analysis, but also other forms of comparative studies such as systematic reviews.[33]

When replication analysis is to be undertaken, several strategies are available: replication of methodology, of analyses and of statistical models. Graves used common methodology to compare the relationship between infant nutrition and behaviour in Nepal with earlier findings from West Bengal.[34] The comparison of the two studies was undertaken in the Discussion section of the paper, which otherwise focused only on the analysis and interpretation of the data from Nepal. In contrast, Miller *et al*[25] investigated the replicability of regression analyses relating caregiver distress to social support and stressors in four data sets. They carried out four analyses separately within data sets, and compared results across data sets for consistency. The comparison of the analysis was undertaken in the Results as well as the Discussion sections of the paper. An alternative approach that is somewhat more stringent is to develop a statistical model with one data set and test the replicability of precisely that model with other data.

Study aim

The aim of this study was to undertake a replication analysis using the 1998, 2003 and 2008–2009 DHS data sets. The objective was to examine the reliability of demographic and socioeconomic (SES) variables in predicting EarlyBF, by comparing analyses of three highly similar yet independent data sets from 1998, 2003 and 2008–2009.

METHODS

Data

The study used data from the Kenya Demographic and Health Survey (KDHS), a nationally representative cross-sectional survey project conducted in 1998, 2003 and 2008–2009. Periods of data collection for the 1998, 2003 and 2008–2009 surveys varied, starting from February to July 1998, April to September 2003 and November 2008

to February 2009, respectively.[4 35 36] These cross-sectional surveys are among a series of DHS conducted in developing countries through the MEASURE DHS programme aimed at assisting developing countries in collecting data on fertility, family planning and maternal and child health.[4 35 36] The data sets are public and required no further ethical clearance for use in this paper.[37]

The KDHS is a household based survey that uses a multistage sampling procedure. The first stage uses the master sampling frames maintained by the Kenya National Bureau of Statistics to select data collection points, also referred to as clusters or sample units. A total of 536, 400 and 400 clusters were selected in 1998, 2003 and 2008–2009, respectively. In the second stage, households were systematically selected from clusters with eligible women in the households interviewed. A total of 7881, 8195 and 8444 women aged 15–49 years were successfully interviewed in 1998, 2003 and 2008–2009, respectively, with a response rate of over 94% across the three surveys. The KDHS sampling design calls for the use of sampling weights.[38]

Data used in the present study were selected from the data described above. The starting point was to select all children aged 0–23 months in the 2008–2009 data (n=2125), the survey in which the fewest children participated. Same-sized samples of children were then selected at random from the 1998 and 2003 data sets using the Statistical Package for Social Sciences (SPSS) random selection procedure. The data associated with each child were collected from its mother in a household.

Analysis

The dependent variable Early BF was coded zero if the mother initiated BF within an hour of birth and one if BF was initiated later. Independent continuous variables were child's age, birth order, mother's age and number of children in a household aged 5 years and below. Independent categorical variables were:

- Child's sex;
- Mother's perceived child's size at birth (small, medium or large);
- Child's place of birth (home or health facility);
- Mode of child's birth (vaginal or caesarean section);
- Province (Nairobi, Central, Coast, Eastern, Nyanza, Rift Valley and Western);
- Residence (urban or rural);
- Wealth Index (richest, richer, middle, poorer or poorest);
- Maternal education (completed secondary and/or higher education, incomplete secondary, complete primary, incomplete primary or no education);
- Maternal occupation (white collar, blue collar or not working);
- Maternal literacy (reads easily, reads with difficulty or cannot read);
- Maternal weekly exposure to media (read newspaper at least once a week or not, watched television at least once a week or not and listened to radio at least once a week or not).

The North-Eastern province was excluded from the analysis because KDHS did not collect data in this province in 1998.[35] The Wealth Index measures household assets.[39]

Statistical analysis was carried out using SPSS V.19. SPSS' complex samples module was used to account for the multistage sampling strategy through weighting and controlling for the primary sampling unit (clusters) and sample domain (strata) in all the analyses. Logistic regression was employed to determine the net effects of each independent variable in the regression model for each survey year. As illustrated in figure 1, the study's statistical models first examined the associations of the outcome variable with the context variables (model 1), followed by the associations of resource variables adjusted for the context (model 2), and lastly the associations of other potential care determinants (eg, child's age) adjusted for context and resources (model 3).

RESULTS

Description of samples

The average age of children was 12 months in 1998, 11 months in 2003 and 11 months in 2008–2009, while that for mothers interviewed was 27 years across the three surveys. On average, households in all the three surveys had two children aged below 5 years of age. Maternal parity averaged four births in 1998 and three births in 2003 and 2008–2009. Table 1 summarises the national sample size distribution for timing of initiation of BF after birth and subgroup samples from 1998 to 2008–2009.

Logistic regression results

Examining the tables showing the results of logistic regression, there are two patterns of reliability that can be discerned: a finding of no significant association across all surveys, or a finding that all associations are significant across all surveys. Here we comment only on the latter expression of reliability. Model 1, shown in table 2, examines the 1998, 2003 and 2008–2009 unadjusted associations of the context variables urban–rural residence and province with EarlyBF. The odds of non-EarlyBF were significantly greater than 1:1 in the Nyanza and Coast provinces compared to the Eastern province in all three surveys. All other year-by-year comparisons failed to support the reliability hypothesis, and thus these analyses present mixed evidence for the reliability of these contextual variables as correlates of EarlyBF.

The effects of resource variables adjusted for the possible confounding role of context are examined in table 3. In the presence of the resource variables, the relationships of the context variables to early BF did not differ markedly

Table 1 Characteristics of the samples by outcome and potential predictor variables included in logistic regression analyses

	KDHS 1998		KDHS 2003		KDHS 2008–2009	
Variables	**n**	**Per cent**	**n**	**Per cent**	**n**	**Per cent**
Total sample	2125	100.0	2125	100.0	2125	100.0
Initiation of breastfeeding						
Within 1 h after birth	1024	54.5	988	48.7	1156	54.9
Later than 1 h after birth	892	45.5	1129	51.3	948	45.1
Sex						
Girls	973	45.3	802	37.3	783	37.2
Boys	1152	54.7	1323	62.7	1342	62.8
Child's place of birth						
Health facility	827	42.7	918	41.2	1013	46.1
Home	1292	57.3	1203	58.8	1106	53.9
Mode of birth						
Vaginal	1780	92.3	2024	95.9	1963	92.6
Caesarean section	137	7.7	100	4.1	162	7.4
Child's size at birth						
Large	406	21.3	557	27.1	677	31.9
Average	1353	62.1	1219	57.3	1118	52.5
Small	353	16.6	341	15.6	307	15.6
Province						
Nairobi	83	7.3	188	6.1	160	5.8
Central	178	9.3	277	10.8	166	7.2
Coast	323	8.0	285	9.2	357	9.8
Eastern	285	16.5	275	16.2	300	15.4
Nyanza	358	21.2	285	15.4	432	20.1
Rift Valley	617	25.1	493	29.1	414	30.2
Western	281	12.6	322	13.2	296	11.5
Residence						
Urban	340	20.0	527	18.5	554	19.9
Rural	1785	80.0	1598	81.5	1571	80.1
Maternal education						
Secondary+	313	16.0	303	12.4	354	16.4
Incomplete secondary	209	10.4	192	9.0	178	8.9
Complete primary	557	25.5	582	28.2	587	31.4
Incomplete primary	819	38.5	753	37.5	715	33.3
No education	227	9.5	295	12.9	291	10.1
Wealth index						
Richest	341	18.7	479	18.8	483	19.6
Richer	402	18.2	358	17.4	380	19.0
Middle	417	19.4	400	19.0	344	18.3
Poorer	468	20.5	412	21.1	392	20.3
Poorest	497	23.2	476	23.7	526	22.8

Continued

Table 1 Continued

Variables	KDHS 1998		KDHS 2003		KDHS 2008–2009	
	n	Per cent	n	Per cent	n	Per cent
Maternal occupation						
White collar	393	20.5	382	17.1	553	25.6
Blue collar	734	35.7	916	45.6	626	33.0
Not working	995	43.8	825	37.3	942	41.4
Maternal literacy						
Reads easily	1280	61.3	1453	68.5	1383	69.3
Reads with difficulty	499	23.7	163	8.4	298	14.0
Cannot read	339	15.1	502	23.1	426	16.2
Mother reads newspaper						
Yes	665	32.9	728	32.8	752	36.8
No	1457	67.1	1393	67.2	1368	63.2
Mother watches television						
Yes	417	21.0	611	27.1	781	36.5
No	1690	79.0	1513	72.9	1344	63.5
Mother listens to radio						
Yes	1206	56.6	1763	82.7	1735	85.1
No	910	43.4	362	17.3	389	14.9

Secondary+, complete secondary and/or higher education.
KDHS, Kenya Demographic and Health Survey.

Table 2 Unadjusted logistic regression models with context variables as predictors of EarlyBF

Variables	KDHS 1998				KDHS 2003				KDHS 2008–2009			
	β	OR	95% CI	Significance (p value)	β	OR	95% CI	Significance (p value)	β	OR	95% CI	Significance (p value)
Residence				0.012				0.602				0.072
Urban (reference)												
Rural	0.503	1.65	1.12 to 2.44		−0.095	0.91	0.64 to 1.30		−0.394	0.67	0.44 to 1.04	
Province				0.000				0.000				0.000
Eastern (reference)												
Nyanza	0.952	2.59	1.67 to 4.02		0.514	1.67	1.06 to 2.64		0.292	1.34	0.82 to 2.19	
Western	0.883	2.42	1.50 to 3.90		1.552	4.72	2.96 to 7.55		1.675	5.34	3.22 to 8.84	
Central	−0.307	0.74	0.44 to 1.23		−0.010	0.99	0.65 to 1.51		0.910	2.48	1.48 to 4.18	
Rift Valley	−0.116	0.89	0.57 to 1.40		−0.037	0.96	0.63 to 1.47		0.342	1.41	0.80 to 2.49	
Nairobi	0.761	2.14	1.08 to 4.24		0.259	1.30	0.72 to 2.33		0.128	1.14	0.57 to 2.27	
Coast	0.854	2.35	1.45 to 3.80		1.848	6.35	3.29 to 12.26		1.432	4.19	2.20 to 7.98	
	r^2=0.060				r^2=0.095				r^2=0.078			

EarlyBF, early initiation of breastfeeding; KDHS, Kenya Demographic and Health Survey; r^2, Cox and Snell pseudo r^2.

from the findings in table 2. For maternal education, the sole finding was of increased risk of non-EarlyBF among mothers with incomplete primary education, compared to those with secondary or higher education in 2003 and 2008–2009. None of the other resource variables exhibited reliable statistically significant associations with EarlyBF.

Model 3 results are shown in table 4. This examines the effects of other care determinants adjusted for the confounding roles of context and resources. Only two variables were reliably related to EarlyBF, province and mode of birth. As in model 1, the odds of non-EarlyBF were significantly greater than 1:1 in the Western and Coast provinces compared to the Eastern province in all three surveys. This indicates an effect that is not accounted for by other variables in the analysis. Furthermore, the magnitudes of the ORs for the Western and Coast provinces were similar in models 1 and 4, which is another sign of reliability. Regarding the mode of birth, the odds of non-EarlyBF were significantly greater than 1:1 for children delivered via caesarean section compared to those having vaginal births for all three surveys. An examination of the ORs and the CIs for the mode of birth findings shows substantial uniformity from survey to survey.

DISCUSSION

Only province and child's mode of birth were reliably associated with EarlyBF. Children in the Western and Coast provinces were significantly more likely to have not received EarlyBF, compared to the Eastern province, a finding observed in the 1998 data and replicated in the 2003 and 2008–2009 data. The other replicable finding was that non-EarlyBF children were more likely to have been born via caesarean section. Caesarean delivery as a barrier to initiating BF within an hour of birth has been reported in numerous studies.[40–42] Explanations advanced for this association include the use of analgesics administered during labour and after delivery that interfere with early development of BF behaviour, and postpartum hospital protocols that separate the mother and the newborn.[43 44] However, the effect of caesarean section on EarlyBF is mixed, with some studies reporting a negative correlation and others finding none.[45] It is argued that even though obstetric experiences during caesarean mode of delivery may influence a mother's BF behaviours, a window of opportunity still exists to initiate BF within an hour if measures are taken by hospitals to promote it.[6 46 47]

Returning to the findings of differences between provinces, within-country variation by region and by ethnicity is often observed in child health.[48] Mothers from one ethnic group may delay BF because of negative cultural beliefs about BF generally[22 49] and about colostrum in particular.[15 18 19] It is sensible to assume that unmeasured mediating variables reflecting culture lie in the path between province-of-residence and EarlyBF. One issue is the degree to which the UNICEF analysis

Table 3 Adjusted logistic regression model with context and resource variables as predictors of EarlyBF

	KDHS 1998				KDHS 2003				KDHS 2008–2009			
Variables	**β**	**OR**	**95% CI**	**Significance (p value)**	**β**	**OR**	**95% CI**	**Significance (p value)**	**β**	**OR**	**95% CI**	**Significance (p value)**
Residence				0.052				0.583				0.124
Urban (reference)												
Rural	0.411	1.51	1.00 to 2.29		0.109	1.12	0.76 to 1.65		−0.404	0.67	0.40 to 1.12	
Province				0.000				0.000				0.000
Eastern (reference)												
Nyanza	0.874	2.40	1.55 to 3.71		0.485	1.63	1.03 to 2.57		0.310	1.36	0.83 to 2.23	
Western	0.956	2.60	1.58 to 4.28		1.575	4.83	3.02 to 7.73		1.824	6.20	3.68 to 10.43	
Central	−0.302	0.74	0.44 to 1.26		−0.018	0.98	0.64 to 1.51		1.013	2.75	1.61 to 4.71	
Rift Valley	−0.126	0.88	0.56 to 1.38		0.023	1.02	0.68 to 1.54		0.423	1.53	0.83 to 2.79	
Nairobi	0.674	1.96	0.95 to 4.04		0.225	1.25	0.69 to 2.28		0.288	1.33	0.67 to 2.67	
Coast	0.842	2.32	1.37 to 3.95		2.016	7.51	3.92 to 14.37		1.430	4.18	2.16 to 8.07	
Wealth Index				0.206				0.761				0.945
Richest (reference)												
Richer	−0.125	0.88	0.55 to 1.41		−0.218	0.80	0.54 to 1.19		−0.137	0.87	0.51 to 1.48	
Middle	−0.166	0.85	0.52 to 1.38		−0.282	0.75	0.48 to 1.18		−0.062	0.94	0.52 to 1.71	
Poorer	0.206	1.23	0.75 to 2.03		−0.241	0.79	0.51 to 1.22		−0.108	0.90	0.50 to 1.62	
Poorest	0.072	1.07	0.63 to 1.82		−0.173	0.84	0.53 to 1.35		0.013	1.01	0.55 to 1.86	
Maternal education				0.141				0.011				0.003
Secondary+ (reference)												
Incomplete secondary	0.586	1.80	1.08 to 2.98		0.410	1.51	0.95 to 2.40		0.245	1.28	0.72 to 2.28	
Complete primary	0.369	1.45	0.96 to 2.19		0.340	1.41	0.97 to 2.04		0.324	1.38	0.86 to 2.24	
Incomplete primary	0.484	1.62	1.07 to 2.46		0.611	1.84	1.24 to 2.74		0.786	2.19	1.37 to 3.52	
No education	0.548	1.73	0.92 to 3.25		0.122	1.13	0.57 to 2.24		0.428	1.53	0.70 to 3.36	
Maternal literacy				0.106				0.924				0.045
Reads easily (reference)												
Reads with difficulty	−0.243	0.63	0.38 to 1.05		−0.072	0.93	0.61 to 1.43		−0.386	0.68	0.44 to 1.05	
Cannot read	−0.459	0.78	0.59 to 1.05		−0.064	0.94	0.62 to 1.42		0.225	1.25	0.82 to 1.91	
Maternal occupation				0.517				0.865				0.085
White collar (reference)												
Blue collar	0.180	1.20	0.85 to 1.68		0.059	1.06	0.77 to 1.46		0.360	1.43	0.95 to 2.16	
Not working	0.164	1.18	0.87 to 1.61		0.087	1.09	0.79 to 1.50		0.468	1.60	1.06 to 2.41	
Mother reads newspaper				0.313				0.043				0.058
Yes (reference)												
No	−0.140	0.87	0.66 to 1.14		−0.271	0.76	0.59 to 0.99		−0.309	0.73	0.53 to 1.01	

Continued

Table 3 Continued

Variables	KDHS 1998			Significance (p value)	KDHS 2003			Significance (p value)	KDHS 2008–2009			Significance (p value)
	β	OR	95% CI		β	OR	95% CI		β	OR	95% CI	
Mother watches TV				0.262				0.408				0.314
Yes (reference)												
No	−0.203	0.82	0.57 to 1.16		−0.109	0.90	0.69 to 1.16		−0.170	0.84	0.61 to 1.18	
Mother listens to radio				0.047				0.210				0.054
Yes (reference)												
No	0.211	1.24	1.00 to 1.52		−0.206	0.81	0.59 to 1.12		−0.375	0.69	0.47 to 1.01	
	r^2=0.075				r^2=0.110				r^2=0.106			

EarlyBF, early initiation of breastfeeding; KDHS, Kenya Demographic and Health Survey; r^2, Cox and Snell pseudo r^2; Secondary+, complete secondary and/or higher education; TV, television.

framework could account for such unmeasured variables, or whether they belong to constructs that should be in the framework, but are not. This cannot be addressed with the present DHS data, but the findings do provoke this question: what is it about the Western and Coast provinces that results in significantly less EarlyBF compared with the Eastern province? The UNICEF framework may well incorporate the concepts that account for this reliable finding, and further research (perhaps using case study methodology) is needed to illuminate the processes and mechanisms that account for the observed variation in EarlyBF. The framework does not give answers, but it does suggest how to search for answers: findings that distal factors are related to EarlyBF calls for a search for intermediate and proximal factors that explain the link. To give an obvious example, differences in health practices from province to province might be part of the explanation, a factor that could not be detected in the DHS data due to a lack of data on health practices.

The aim of this paper was to undertake a replication analysis. The Introduction section summarised various approaches to this type of research, ending with the suggestion that a rigorous form of replication analysis is to develop a statistical model with one set of data and attempt to replicate it with another set of data. A ubiquitous feature of research is that many data sets on the same subject use different analytical frameworks, different variables and different operationalisation of the same variables. Owing to such differences and other methodological variations, the possibility to implement this rigorous form of replication analysis is quite limited. The problem is that a failure to replicate could be attributed to many factors, only one of which is a poorly fitting model in the original analysis. The DHS offers a rare opportunity to undertake replication analysis with data sets that are highly comparable. The core of DHS questionnaires is essentially the same from year to year and from country to country, as is the methodological approach. Aside from some inevitable variation in content and methodology, the main variation from DHS survey to DHS survey is timing and sample composition. Thus, period effects and sampling effects can be expected to impact analyses and findings. An example of such effects is a large increase from an earlier to a later survey in the level of maternal education, resulting in a rise in health literacy, that in itself might alter the way women responded to survey workers' interviews, and that actually reflected changes in women's lives and experiences. Such effects might affect associations between variables used in a replication analysis, resulting in poor replication. In such cases, the failure to replicate would be a consequence of changes in the underlying phenomena, and it would be correct to conclude that findings from one context were not applicable to another context, even if both contexts were situated in the same country (periods as contexts).

Table 4 Adjusted logistic regression models with context, resource and other care determinants as predictors of EarlyBF

	KDHS 1998				KDHS 2003				KDHS 2008–2009			
Variables	**β**	**OR**	**95% CI**	**Significance (p value)**	**β**	**OR**	**95% CI**	**Significance (p value)**	**β**	**OR**	**95% CI**	**Significance (p value)**
Residence				0.083				0.871				0.120
Urban (reference)												
Rural	0.390	1.48	0.95 to 2.30		0.035	1.04	0.68 to 1.58		−0.430	0.65	0.38 to 1.12	
Province				0.000				0.000				0.000
Eastern (reference)												
Nyanza	0.914	2.50	1.60 to 3.90		0.522	1.69	1.04 to 2.75		0.316	1.37	0.81 to 2.31	
Western	0.983	2.67	1.61 to 4.43		1.593	4.92	3.01 to 8.04		1.803	6.07	3.54 to 10.39	
Central	−0.277	0.76	0.44 to 1.30		−0.049	0.95	0.61 to 1.48		1.036	2.82	1.61 to 4.92	
Rift Valley	−0.167	0.85	0.54 to 1.33		0.003	1.00	0.66 to 1.53		0.399	1.49	0.79 to 2.81	
Nairobi	0.702	2.02	0.98 to 4.14		0.169	1.18	0.63 to 2.23		0.292	1.34	0.64 to 2.80	
Coast	0.800	2.23	1.31 to 3.79		2.031	7.62	3.90 to 14.90		1.519	4.57	2.30 to 9.05	
Wealth Index				0.200				0.907				0.907
Richest (reference)												
Richer	−0.155	0.86	0.53 to 1.37		−0.135	0.87	0.57 to 1.34		−0.146	0.87	0.50 to 1.50	
Middle	−0.134	0.88	0.54 to 1.43		−0.201	0.82	0.51 to 1.31		0.003	1.00	0.53 to 1.91	
Poorer	0.222	1.25	0.74 to 2.10		−0.209	0.81	0.51 to 1.30		−0.110	0.90	0.47 to 1.70	
Poorest	0.104	1.11	0.65 to 1.90		−0.110	0.90	0.54 to 1.48		0.011	1.01	0.53 to 1.95	
Maternal education				0.163				0.024				0.003
Secondary+ (reference)												
Incomplete secondary	0.625	1.87	1.10 to 3.17		0.481	1.62	0.97 to 2.69		0.243	1.28	0.70 to 2.33	
Complete primary	0.359	1.43	0.92 to 2.23		0.377	1.46	0.96 to 2.22		0.353	1.42	0.87 to 2.33	
Incomplete primary	0.449	1.57	1.00 to 2.45		0.626	1.87	1.19 to 2.95		0.838	2.31	1.43 to 3.75	
No education	0.604	1.83	0.94 to 3.56		0.144	1.16	0.56 to 2.41		0.531	1.70	0.77 to 3.75	
Maternal literacy				0.117				0.937				0.031
Reads easily (reference)												
Reads with difficulty	−0.236	0.79	0.59 to 1.06		−0.053	0.95	0.62 to 1.46		−0.418	0.66	0.42 to 1.04	
Cannot read	−0.473	0.62	0.37 to 1.06		−0.071	0.93	0.61 to 1.43		0.259	1.30	0.82 to 2.06	
Maternal occupation				0.609				0.769				0.103
White collar (reference)												
Blue collar	0.126	1.13	0.80 to 1.61		0.083	1.09	0.79 to 1.50		0.384	1.47	0.98 to 2.20	
Not working	0.158	1.17	0.86 to 1.60		0.121	1.13	0.81 to 1.57		0.453	1.57	1.03 to 2.42	
Mother reads newspaper				0.238				0.065				0.053
Yes (reference)												
No	−0.167	0.85	0.64 to 1.12		−0.255	0.78	0.59 to 1.02		−0.325	0.72	0.52 to 1.00	

Continued

Table 4 Continued

Variables	KDHS 1998 β	OR	95% CI	Significance (p value)	KDHS 2003 β	OR	95% CI	Significance (p value)	KDHS 2008–2009 β	OR	95% CI	Significance (p value)
Mother watches TV				0.211				0.289				0.287
Yes (reference)												
No	−0.232	0.79	0.55 to 1.14		−0.141	0.87	0.67 to 1.13		−0.189	0.83	0.58 to 1.17	
Mother listens to radio				0.106				0.195				0.041
Yes (reference)												
No	0.181	1.20	0.96 to 1.49		−0.217	0.81	0.58 to 1.12		−0.421	0.66	0.44 to 0.98	
Sex				0.964				0.015				0.513
Girls (reference)												
Boys	−0.005	1.00	0.81 to 1.23		0.225	1.25	1.05 to 1.50		−0.079	0.92	0.73 to 1.17	
Child's size at birth				0.036				0.091				0.014
Large (reference)												
Average	−0.041	0.96	0.73 to 1.26		−0.265	0.77	0.59 to 1.00		−0.285	0.75	0.57 to 1.00	
Small	0.381	1.46	1.02 to 2.10		−0.035	0.97	0.70 to 1.33		0.193	1.21	0.82 to 1.79	
Mode of birth				0.000				0.000				0.000
Vaginal (reference)												
Caesarean section	0.968	2.63	1.72 to 4.04		1.212	3.36	1.83 to 6.16		1.255	3.51	2.17 to 5.69	
Place of birth				0.013				0.193				0.001
Health facility (reference)												
Home	0.341	1.41	1.08 to 1.84		0.187	1.21	0.91 to 1.60		0.492	1.64	1.21 to 2.21	
Child's age (months)	−0.008	0.99	0.98 to 1.01	0.340	−0.004	1.00	0.98 to 1.01	0.573	−0.007	0.99	0.98 to 1.01	0.370
No of children aged <5 years	−0.150	0.86	0.76 to 0.97	0.016	−0.013	0.99	0.87 to 1.12	0.844	0.018	1.02	0.88 to 1.18	0.812
Maternal age (years)	−0.016	0.98	0.96 to 1.01	0.294	0.004	1.00	0.97 to 1.04	0.787	−0.002	1.00	0.96 to 1.04	0.921
Parity	0.040	1.04	0.95 to 1.14	0.375	−0.016	0.98	0.89 to 1.09	0.749	−0.093	0.91	0.80 to 1.04	0.172
	r^2=0.096				r^2=0.125				r^2=0.144			

EarlyBF, early initiation of breastfeeding; KDHS, Kenya Demographic and Health Survey; r^2, Cox and Snell pseudo r^2; Secondary+, complete secondary and/or higher education; TV, television.

The Results section did not dwell on the common replicated finding of no association between a possible predictor and the outcome. A good example is the Wealth Index, for which there is no evidence in any of the surveys for an association with EarlyBF. This may be seen as perplexing, given the large literature describing an SES gradient in health. A finding of this type raises some possibilities for further research. There may be an SES gradient in EarlyBF, but the Wealth Index fails to include the SES factors that are important. What is known, because of the replication analysis, is that the Wealth Index is not a reliable predictor of EarlyBF, at least not in Kenya, and this supports the need for further research into the nature of a possible SES association with EarlyBF. As for all analyses, replication analyses may well raise far more questions than they can answer.

This study has strengths and limitations that are interrelated. The study derives its main strength from the usage of national cross-sectional data collected in three surveys to study the reliability of demographic and SES variables in predicting EarlyBF. This is significant because it provides unique data on the degree of confidence nutrition scientists can have about the relative importance of several key putative predictors of early versus late initiation of BF. If the findings from 1998 are closely replicated with data from the succeeding surveys, possible validity problems related to period, cohort and selection effects are ameliorated. The absence of replication calls for further research into such effects. A major limitation of this study relates to the failure to measure a host of sociodemographic, social-psychological, cultural and political variables, which might have effects on EarlyBF. This is an inherent weakness of large-scale survey research, which is unsuited to the detailed investigation of health-related phenomena. It is also important to comment on how the quality of the DHS data limits this study, even if the DHS makes every reasonable effort to produce high-quality data. For example, it is possible that excluded variables such as the number of antenatal visits and type of birth attendant during delivery could have a relationship to EarlyBF. Despite the existence of these variables in the KDHS, these variables were not incorporated in the regression models due to high rates of missing data in one of the surveys.

CONCLUSIONS

The objective was to examine the reliability of demographic and SES variables in predicting EarlyBF, by comparing analyses of three highly similar yet independent data sets from 1998, 2003 and 2008–2009. The main finding is that significant predictor variables produced using the 1998 data were poorly replicated using the 2003 and 2008–2009 data. Only mode of birth and province of residence reliably predicted EarlyBF across the three surveys. Children delivered through caesarean section (compared to vaginal birth), and in the Western and Coast provinces (compared to the Eastern province), were at a higher risk of being breastfed later than an hour after birth across all three surveys.

The 1998 KDHS data do not provide the basis for reliable analyses of the correlates of EarlyBF, with reliability conceptualised as replicability using highly similar data sets from 2003 and 2008–2009. We speculate that activities in parts or all of Kenya (eg, political activities leading to changed or new social and welfare programmes, health promotion education and/or policy interventions) changed the analysis context in the period between 1998 and 2008–2009, and that these changes were of a sufficient magnitude to affect the analyses. We cannot pursue this line of reasoning further, because no registry of health-related programmes and activities at local, regional and national levels is available for the study period, as far as we are aware. The establishment of such a registry would be useful as a source of documentation about health interventions undertaken to improve child health. We conclude that reliability analysis is useful to test hypotheses about putative risk and protective factors in the context of descriptive research, perhaps leading to caution as in the present study.

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Dennis J Matanda, Maurice B Mittelmark, Helga B Urke, et al.

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Appendix

IV

CONFIDENTIAL

KENYA NATIONAL BUREAU OF STATISTICS
KENYA DEMOGRAPHIC AND HEALTH SURVEY 2008
WOMAN'S QUESTIONNAIRE

IDENTIFICATION

PROVINCE* _____

DISTRICT _____

LOCATION/TOWN _____

SUBLOCATION/WARD _____

NASSEP CLUSTER NUMBER . . . . . .

KDHS CLUSTER NUMBER . . . . . .

HOUSEHOLD NUMBER . . . . . .

NAIROBI/MOMBASA/KISUMU=1; NAKURU/ELDORET/THIKA/NYERI=2;
SMALL TOWN=3; RURAL=4 . . . . . .

NAME OF HOUSEHOLD HEAD _____

NAME AND LINE NUMBER OF WOMAN _____

INTERVIEWER VISITS

	1	2	3	FINAL VISIT
DATE				DAY / MONTH / YEAR (2 0 0)
INTERVIEWER'S NAME				INT. NUMBER
RESULT**				FINAL RESULT
NEXT VISIT: DATE				TOTAL NUMBER OF VISITS
TIME				

**RESULT CODES:

1	COMPLETED	4	REFUSED		
2	NOT AT HOME	5	PARTLY COMPLETED	7	OTHER _____ (SPECIFY)
3	POSTPONED	6	INCAPACITATED		

LANGUAGE

LANGUAGE OF QUESTIONNAIRE: ENGLISH

LANGUAGE OF INTERVIEW*** _____

HOME LANGUAGE OF RESPONDENT*** _____

WAS A TRANSLATOR USED? (YES=1, NO=2) . . . . . .

***LANGUAGE CODES:

01 EMBU	04 KIKUYU	07 LUO	10 MIJIKENDA	13 ENGLISH
02 KALENJIN	05 KISII	08 MAASAI	11 SOMALI	14 OTHER
03 KAMBA	06 LUHYA	09 MERU	12 KISWAHILI	

SUPERVISOR	FIELD EDITOR	OFFICE EDITOR	KEYED BY
NAME _____	NAME _____		
DATE _____	DATE _____		

* Province: NAIROBI=1; CENTRAL=2; COAST=3; EASTERN=4; NYANZA=5; R.VALLEY=6; WESTERN=7; NORTHEASTERN=8

SECTION 1. RESPONDENT'S BACKGROUND

INTRODUCTION AND CONSENT

Hello. My name is _____ and I am working with the Kenya National Bureau of Statistics. We are conducting a national survey that asks women about various health issues. We would very much appreciate your participation in this survey.
This information will help the government to plan health services. The survey usually takes between 30 to 60 minutes to complete. Whatever information you provide will be kept confidential and will not be shown to anyone other than members of our survey team.

Participation in this survey is voluntary, and if we should come to any question you don't want to answer, just let me know and I will go on to the next question; or you can stop the interview at any time. However, we hope that you will participate in this survey since your views are important.
At this time, do you want to ask me anything about the survey?

May I begin the interview now?

Signature of interviewer: _____ Date: _____

RESPONDENT AGREES TO BE INTERVIEWED . . . . . 1 ↓ RESPONDENT DOES NOT AGREE TO BE INTERVIEWED . . . 2 → END

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
101	RECORD THE TIME.	HOUR . . . . . ☐☐ MINUTES . . . . . ☐☐	
102	First I would like to ask some questions about you and your household. For most of the time until you were 12 years old, did you live in Nairobi, Mombasa, in another city or town, or in the country-side?	NAIROBI/ MOMBASA/KISUMU . . . . . 1 OTHER CITY/TOWN . . . . . 2 COUNTRY SIDE . . . . . 3 OUTSIDE KENYA 4	
103	How long have you been living continuously in (NAME OF CURRENT PLACE OF RESIDENCE)? IF LESS THAN ONE YEAR, RECORD '00' YEARS.	YEARS . . . . . ☐☐ ALWAYS . . . . . 95 VISITOR 96	→ 106
104	Just before you moved here, did you live in a city, in a town, or in the countryside?	CITY . . . . . 1 TOWN . . . . . 2 COUNTRYSIDE 3	
106	In what month and year were you born?	MONTH . . . . . ☐☐ DON'T KNOW MONTH . . . . . 98 YEAR . . . . . ☐☐☐☐ DON'T KNOW YEAR 9998	
107	How old were you at your last birthday? COMPARE AND CORRECT 106 AND/OR 107 IF INCONSISTENT.	AGE IN COMPLETED YEARS ☐☐	
108	Have you ever attended school?	YES . . . . . 1 NO 2	→ 112
109	What is the highest level of school you attended: primary, vocational, secondary, or higher?	PRIMARY . . . . . 1 POST-PRIMARY/VOCATIONAL . . . . . 2 SECONDARY/'A' LEVEL . . . . . 3 COLLEGE (MIDDLE LEVEL) . . . . . 4 UNIVERSITY 5	
110	What is the highest (standard/form/year) you completed at that level? IF NONE, WRITE '00'.	STANDARD/FORM/YEAR . . . ☐☐	

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
111	CHECK 109: PRIMARY, POST-PRIMARY/VOCATIONAL, ↓ SECONDARY OR HIGHER → 115		
112	Now I would like you to read this sentence to me. SHOW SENTENCES BELOW TO RESPONDENT. IF RESPONDENT CANNOT READ WHOLE SENTENCE, PROBE: Can you read any part of the sentence to me?	CANNOT READ AT ALL . . . . . 1 ABLE TO READ ONLY PARTS OF SENTENCE . . . . . 2 ABLE TO READ WHOLE SENTENCE. . 3 NO CARD WITH REQUIRED LANGUAGE _____ 4 (SPECIFY LANGUAGE) BLIND/VISUALLY IMPAIRED 5	
113	Have you ever participated in a literacy program or any other program that involves learning to read or write (not including primary school)?	YES . . . . . 1 NO 2	
114	CHECK 112: CODE '2', '3', OR '4' CIRCLED ↓ CODE '1' OR '5' CIRCLED → 116		
115	Do you read a newspaper or magazine almost every day, at least once a week, less than once a week or not at all?	ALMOST EVERY DAY . . . . . 1 AT LEAST ONCE A WEEK . . . . . 2 LESS THAN ONCE A WEEK . . . . . 3 NOT AT ALL 4	
116	Do you listen to the radio almost every day, at least once a week, less than once a week or not at all?	ALMOST EVERY DAY . . . . . 1 AT LEAST ONCE A WEEK . . . . . 2 LESS THAN ONCE A WEEK . . . . . 3 NOT AT ALL 4	
117	Do you watch television almost every day, at least once a week, less than once a week or not at all?	ALMOST EVERY DAY . . . . . 1 AT LEAST ONCE A WEEK . . . . . 2 LESS THAN ONCE A WEEK . . . . . 3 NOT AT ALL 4	
118	What is your religion?	ROMAN CATHOLIC . . . . . 1 PROTESTANT/OTHER CHRISTIAN . . . 2 MUSLIM . . . . . 3 NO RELIGION . . . . . 4 OTHER _____ 6 (SPECIFY)	
119	What is your ethnic group/tribe?	EMBU . . . . . 01 KALENJIN . . . . . 02 KAMBA . . . . . 03 KIKUYU . . . . . 04 KISII . . . . . 05 LUHYA . . . . . 06 LUO . . . . . 07 MASAI . . . . . 08 MERU . . . . . 09 MIJIKENDA/SWAHILI . . . . . 10 SOMALI . . . . . 11 TAITA/TAVETA . . . . . 12 OTHER _____ 96 (SPECIFY)	

SECTION 2. REPRODUCTION

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
201	Now I would like to ask about all the live births you have had during your life. Have you ever given birth?	YES . . . . . 1 NO 2	→ 206
202	Do you have any sons or daughters to whom you have given birth who are now living with you?	YES . . . . . 1 NO 2	→ 204
203	How many sons live with you? And how many daughters live with you? IF NONE, RECORD '00'.	SONS AT HOME . . . . . [ ][ ] DAUGHTERS AT HOME . . . . . [ ][ ]	
204	Do you have any sons or daughters to whom you have given birth who are alive but do not live with you?	YES . . . . . 1 NO 2	→ 206
205	How many sons are alive but do not live with you? And how many daughters are alive but do not live with you? IF NONE, RECORD '00'.	SONS ELSEWHERE . . . . . [ ][ ] DAUGHTERS ELSEWHERE . . . [ ][ ]	
206	Sometimes it happens that children die. It may be painful to talk about and I am sorry to ask you about painful memories, but it is important to get correct information. Have you ever given birth to a son or daughter who was born alive but later died? IF NO, PROBE: Any baby who cried or showed signs of life but did not survive?	YES . . . . . 1 NO 2	→ 208
207	How many boys have died? And how many girls have died? IF NONE, RECORD '00'.	BOYS DEAD . . . . . [ ][ ] GIRLS DEAD . . . . . [ ][ ]	
208	SUM ANSWERS TO 203, 205, AND 207, AND ENTER TOTAL. IF NONE, RECORD '00'.	TOTAL . . . . . [ ][ ]	
209	CHECK 208: Just to make sure that I have this right: you have had in TOTAL _____ births during your life. Is that correct? YES ☐ ↓ NO ☐ → PROBE AND CORRECT 201-208 AS NECESSARY.		
210	CHECK 208: ONE OR MORE BIRTHS ☐ ↓ NO BIRTHS ☐ →		226

211 Now I would like to record the names of all your births, whether still alive or not, starting with the first one you had.
RECORD NAMES OF ALL THE BIRTHS IN 212. RECORD TWINS AND TRIPLETS ON SEPARATE LINES.
(IF THERE ARE MORE THAN 12 BIRTHS, USE AN ADDITIONAL QUESTIONNAIRE, STARTING WITH THE SECOND ROW).

212 What name was given to your (first/next) baby? (NAME)	213 Were any of these births twins?	214 Is (NAME) a boy or a girl?	215 In what month and year was (NAME) born? PROBE: What is his/her birthday?	216 Is (NAME) still alive?	217 IF ALIVE: How old was (NAME) at his/her last birthday? RECORD AGE IN COM-PLETED YEARS.	218 IF ALIVE: Is (NAME) living with you?	219 IF ALIVE: RECORD HOUSE-HOLD LINE NUMBER OF CHILD (RECORD '00' IF CHILD NOT LISTED IN HOUSE-HOLD).	220 IF DEAD: How old was (NAME) when he/she died? IF '1 YR', PROBE: How many months old was (NAME)? RECORD DAYS IF LESS THAN 1 MONTH; MONTHS IF LESS THAN TWO YEARS; OR YEARS.	221 Were there any other live births between (NAME OF PREVIOUS BIRTH) and (NAME), including any children who died after birth?
01	SING 1 MULT 2	BOY 1 GIRL 2	MONTH YEAR	YES . . 1 NO . . . 2 → 220	AGE IN YEARS	YES . . . 1 NO 2	LINE NUMBER (NEXT BIRTH)	DAYS . . . 1 MONTHS 2 YEARS . . 3	
02	SING 1 MULT 2	BOY 1 GIRL 2	MONTH YEAR	YES . . 1 NO . . . 2 → 220	AGE IN YEARS	YES . . . 1 NO 2	LINE NUMBER (GO TO 221)	DAYS . . . 1 MONTHS 2 YEARS . . 3	YES . . . . 1 ADD BIRTH NO . . . . . 2 NEXT BIRTH
03	SING 1 MULT 2	BOY 1 GIRL 2	MONTH YEAR	YES . . 1 NO . . . 2 → 220	AGE IN YEARS	YES . . . 1 NO 2	LINE NUMBER (GO TO 221)	DAYS . . . 1 MONTHS 2 YEARS . . 3	YES . . . . 1 ADD BIRTH NO . . . . . 2 NEXT BIRTH
04	SING 1 MULT 2	BOY 1 GIRL 2	MONTH YEAR	YES . . 1 NO . . . 2 → 220	AGE IN YEARS	YES . . . 1 NO 2	LINE NUMBER (GO TO 221)	DAYS . . . 1 MONTHS 2 YEARS . . 3	YES . . . . 1 ADD BIRTH NO . . . . . 2 NEXT BIRTH
05	SING 1 MULT 2	BOY 1 GIRL 2	MONTH YEAR	YES . . 1 NO . . . 2 → 220	AGE IN YEARS	YES . . . 1 NO 2	LINE NUMBER (GO TO 221)	DAYS . . . 1 MONTHS 2 YEARS . . 3	YES . . . . 1 ADD BIRTH NO . . . . . 2 NEXT BIRTH
06	SING 1 MULT 2	BOY 1 GIRL 2	MONTH YEAR	YES . . 1 NO . . . 2 → 220	AGE IN YEARS	YES . . . 1 NO 2	LINE NUMBER (GO TO 221)	DAYS . . . 1 MONTHS 2 YEARS . . 3	YES . . . . 1 ADD BIRTH NO . . . . . 2 NEXT BIRTH
07	SING 1 MULT 2	BOY 1 GIRL 2	MONTH YEAR	YES . . 1 NO . . . 2 → 220	AGE IN YEARS	YES . . . 1 NO 2	LINE NUMBER (GO TO 221)	DAYS . . . 1 MONTHS 2 YEARS . . 3	YES . . . . 1 ADD BIRTH NO . . . . . 2 NEXT BIRTH

212 What name was given to your next baby? (NAME)	213 Were any of these births twins?	214 Is (NAME) a boy or a girl?	215 In what month and year was (NAME) born? PROBE: What is his/her birthday?	216 Is (NAME) still alive?	217 IF ALIVE: How old was (NAME) at his/her last birthday? RECORD AGE IN COM-PLETED YEARS.	218 IF ALIVE: Is (NAME) living with you?	219 IF ALIVE: RECORD HOUSE-HOLD LINE NUMBER OF CHILD (RECORD '00' IF CHILD NOT LISTED IN HOUSE-HOLD).	220 IF DEAD: How old was (NAME) when he/she died? IF '1 YR', PROBE: How many months old was (NAME)? RECORD DAYS IF LESS THAN 1 MONTH; MONTHS IF LESS THAN TWO YEARS; OR YEARS.	221 Were there any other live births between (NAME OF PREVIOUS BIRTH) and (NAME), including any children who died after birth?
08	SING 1 MULT 2	BOY 1 GIRL 2	MONTH YEAR	YES . . 1 NO . . . 2 → 220	AGE IN YEARS	YES . . . 1 NO 2	LINE NUMBER (GO TO 221)	DAYS . . . 1 MONTHS 2 YEARS . . 3	YES . . . . 1 ADD BIRTH NO . . . . . 2 NEXT BIRTH
09	SING 1 MULT 2	BOY 1 GIRL 2	MONTH YEAR	YES . . 1 NO . . . 2 → 220	AGE IN YEARS	YES . . . 1 NO 2	LINE NUMBER (GO TO 221)	DAYS . . . 1 MONTHS 2 YEARS . . 3	YES . . . . 1 ADD BIRTH NO . . . . . 2 NEXT BIRTH
10	SING 1 MULT 2	BOY 1 GIRL 2	MONTH YEAR	YES . . 1 NO . . . 2 → 220	AGE IN YEARS	YES . . . 1 NO 2	LINE NUMBER (GO TO 221)	DAYS . . . 1 MONTHS 2 YEARS . . 3	YES . . . . 1 ADD BIRTH NO . . . . . 2 NEXT BIRTH
11	SING 1 MULT 2	BOY 1 GIRL 2	MONTH YEAR	YES . . 1 NO . . . 2 → 220	AGE IN YEARS	YES . . . 1 NO 2	LINE NUMBER (GO TO 221)	DAYS . . . 1 MONTHS 2 YEARS . . 3	YES . . . . 1 ADD BIRTH NO . . . . . 2 NEXT BIRTH
12	SING 1 MULT 2	BOY 1 GIRL 2	MONTH YEAR	YES . . 1 NO . . . 2 → 220	AGE IN YEARS	YES . . . 1 NO 2	LINE NUMBER (GO TO 221)	DAYS . . . 1 MONTHS 2 YEARS . . 3	YES . . . . 1 ADD BIRTH NO . . . . . 2 NEXT BIRTH

222	Have you had any live births since the birth of (NAME OF LAST BIRTH)? IF YES, RECORD BIRTH(S) IN TABLE.	YES . . . . . 1 NO 2

223 COMPARE 208 WITH NUMBER OF BIRTHS IN HISTORY ABOVE AND MARK:

NUMBERS ARE SAME ☐ ↓ NUMBERS ARE DIFFERENT ☐ → (PROBE AND RECONCILE)

CHECK:

- FOR EACH BIRTH: YEAR OF BIRTH IS RECORDED. ☐
- FOR EACH BIRTH SINCE JANUARY 2003: MONTH AND YEAR OF BIRTH ARE RECORDED. ☐
- FOR EACH LIVING CHILD: CURRENT AGE IS RECORDED. ☐
- FOR EACH DEAD CHILD: AGE AT DEATH IS RECORDED. ☐
- FOR AGE AT DEATH 12 MONTHS OR 1 YEAR: PROBE TO DETERMINE EXACT NUMBER OF MONTHS. ☐

224 CHECK 215 AND ENTER THE NUMBER OF BIRTHS IN 2003 OR LATER. IF NONE, RECORD '0' AND SKIP TO 226. ☐

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
225	FOR EACH BIRTH SINCE JANUARY 2003, ENTER 'B' IN THE MONTH OF BIRTH IN THE CALENDAR. WRITE THE NAME OF THE CHILD TO THE LEFT OF THE 'B' CODE. FOR EACH BIRTH, ASK THE NUMBER OF MONTHS THE PREGNANCY LASTED AND RECORD 'P' IN EACH OF THE PRECEDING MONTHS ACCORDING TO THE DURATION OF PREGNANCY. (NOTE: THE NUMBER OF 'P's MUST BE ONE LESS THAN THE NUMBER OF MONTHS THAT THE PREGNANCY LASTED.)		
226	Are you pregnant now?	YES . . . . . 1 NO . . . . . 2 UNSURE 8	→ 229
227	How many months pregnant are you? RECORD NUMBER OF COMPLETED MONTHS. ENTER 'P's IN THE CALENDAR, BEGINNING WITH THE MONTH OF INTERVIEW AND FOR THE TOTAL NUMBER OF COMPLETED MONTHS.	MONTHS	
228	At the time you became pregnant, did you want to become pregnant then, did you want to wait until later, or did you not want to have any (more) children at all?	THEN . . . . . 1 LATER . . . . . 2 NOT AT ALL 3	
229	Have you ever had a pregnancy that miscarried, was aborted, or ended in a stillbirth?	YES . . . . . 1 NO 2	→ 237
230	When did the last such pregnancy end?	MONTH . . . . . YEAR	
231	CHECK 230: LAST PREGNANCY ENDED IN JAN. 2003 OR LATER LAST PREGNANCY ENDED BEFORE JAN. 2003		→ 237
232	How many months pregnant were you when the last such pregnancy ended? RECORD NUMBER OF COMPLETED MONTHS. ENTER 'T' IN THE CALENDAR IN THE MONTH THAT THE PREGNANCY TERMINATED AND 'P' FOR THE REMAINING NUMBER OF COMPLETED MONTHS.	MONTHS	
233	Since January 2003, have you had any other pregnancies that did not result in a live birth?	YES . . . . . 1 NO 2	→ 235
234	ASK THE DATE AND THE DURATION OF PREGNANCY FOR EACH EARLIER NON-LIVE BIRTH PREGNANCY BACK TO JANUARY 2003. ENTER 'T' IN THE CALENDAR IN THE MONTH THAT EACH PREGNANCY TERMINATED AND 'P' FOR THE REMAINING NUMBER OF COMPLETED MONTHS.		
235	Did you have any miscarriages, abortions or stillbirths that ended before 2003?	YES . . . . . 1 NO 2	→ 237
236	When did the last such pregnancy that terminated before 2003 end?	MONTH . . . . . YEAR	

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
237	When did your last menstrual period start? _____ (DATE, IF GIVEN)	DAYS AGO . . . . . 1 [ ][ ] WEEKS AGO . . . . . 2 [ ][ ] MONTHS AGO . . . . . 3 [ ][ ] YEARS AGO . . . . . 4 [ ][ ] IN MENOPAUSE/ HAS HAD HYSTERECTOMY . . . 994 BEFORE LAST BIRTH . . . . . 995 NEVER MENSTRUATED 996	
238	From one menstrual period to the next, are there certain days when a woman is more likely to become pregnant if she has sexual relations?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	→ 301
239	Is this time just before her period begins, during her period, right after her period has ended, or halfway between two periods?	JUST BEFORE HER PERIOD BEGINS . . . . . 1 DURING HER PERIOD . . . . . 2 RIGHT AFTER HER PERIOD HAS ENDED . . . . . 3 HALFWAY BETWEEN TWO PERIODS . . . . . 4 OTHER _____ 6 (SPECIFY) DON'T KNOW 8	

SECTION 3. CONTRACEPTION

301	Now I would like to talk about family planning - the various ways or methods that a couple can use to delay or avoid a pregnancy. Which ways or methods have you heard about? FOR METHODS NOT MENTIONED SPONTANEOUSLY, ASK: Have you ever heard of (METHOD)? CIRCLE CODE 1 IN 301 FOR EACH METHOD MENTIONED SPONTANEOUSLY. THEN PROCEED DOWN COLUMN 301, READING THE NAME AND DESCRIPTION OF EACH METHOD NOT MENTIONED SPONTANEOUSLY. CIRCLE CODE 1 IF METHOD IS RECOGNIZED, AND CODE 2 IF NOT RECOGNIZED. THEN, FOR EACH METHOD WITH CODE 1 CIRCLED IN 301, ASK 302.		302 Have you ever used (METHOD)?
01	FEMALE STERILIZATION Women can have an operation to avoid having any more children.	YES . . . . . 1 NO 2	Have you ever had an operation to avoid having any more children? YES . . . . . 1 NO 2
02	MALE STERILIZATION Men can have an operation to avoid having any more children.	YES . . . . . 1 NO 2	Have you ever had a partner who had an operation to avoid having any more children? YES . . . . . 1 NO 2
03	PILL Women can take a pill every day to avoid becoming pregnant.	YES . . . . . 1 NO 2	YES . . . . . 1 NO 2
04	IUD Women can have a loop or coil placed inside them by a doctor or a nurse.	YES . . . . . 1 NO 2	YES . . . . . 1 NO 2
05	INJECTABLES Women can have an injection by a health provider that stops them from becoming pregnant for one or more months.	YES . . . . . 1 NO 2	YES . . . . . 1 NO 2
06	IMPLANTS Women can have several small rods placed in their upper arm by a doctor or nurse which can prevent pregnancy for one or more years.	YES . . . . . 1 NO 2	YES . . . . . 1 NO 2
07	CONDOM Men can put a rubber sheath on their penis before sexual intercourse.	YES . . . . . 1 NO 2	YES . . . . . 1 NO 2
08	FEMALE CONDOM Women can place a sheath in their vagina before sexual intercourse.	YES . . . . . 1 NO 2	YES . . . . . 1 NO 2
09	LACTATIONAL AMENORRHEA METHOD (LAM)	YES . . . . . 1 NO 2	YES . . . . . 1 NO 2
10	RHYTHM METHOD Every month that a woman is sexually active she can avoid pregnancy by not having sexual intercourse on the days of the month she is most likely to get pregnant.	YES . . . . . 1 NO 2	YES . . . . . 1 NO 2
11	WITHDRAWAL Men can be careful and pull out before climax.	YES . . . . . 1 NO 2	YES . . . . . 1 NO 2
12	EMERGENCY CONTRACEPTION As an emergency measure after unprotected sexual intercourse, women can take special pills at any time within five days to prevent pregnancy.	YES . . . . . 1 NO 2	YES . . . . . 1 NO 2
13	Have you heard of any other ways or methods that women or men can use to avoid pregnancy?	YES . . . . . 1 _____ (SPECIFY) _____ (SPECIFY) NO 2	YES . . . . . 1 NO . . . . . 2 YES . . . . . 1 NO 2
303	CHECK 302: NOT A SINGLE "YES" (NEVER USED) →	AT LEAST ONE "YES" (EVER USED) → 307	

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
304	Have you ever used anything or tried in any way to delay or avoid getting pregnant?	YES . . . . . 1 NO 2	→ 306
305	ENTER '0' IN THE CALENDAR IN EACH BLANK MONTH.		→ 333
306	What have you used or done? CORRECT 302 AND 303 (AND 301 IF NECESSARY).		
307	Now I would like to ask you about the first time that you did something or used a method to avoid getting pregnant. How many living children did you have at that time, if any? IF NONE, RECORD '00'.	NUMBER OF CHILDREN . . . . . ☐☐	
308	CHECK 302 (01): WOMAN NOT STERILIZED ☐↓ WOMAN STERILIZED ☐ → 311A		
309	CHECK 226: NOT PREGNANT OR UNSURE ☐↓ PREGNANT ☐ → 322		
310	Are you currently doing something or using any method to delay or avoid getting pregnant?	YES . . . . . 1 NO 2	→ 322
311 311A	Which method are you using? CIRCLE ALL MENTIONED. IF MORE THAN ONE METHOD MENTIONED, FOLLOW SKIP INSTRUCTION FOR HIGHEST METHOD IN LIST. CIRCLE 'A' FOR FEMALE STERILIZATION.	FEMALE STERILIZATION . . . . . A MALE STERILIZATION . . . . . B → 316 PILL . . . . . C IUD . . . . . D INJECTABLES . . . . . E → 315 IMPLANTS . . . . . F CONDOM . . . . . G FEMALE CONDOM . . . . . H → 315 LACTATIONAL AMENORRHEA (LAM) I RHYTHM METHOD . . . . . L WITHDRAWAL . . . . . M → 319A OTHER _____ X (SPECIFY)	
312	RECORD IF CODE 'C' FOR PILL IS CIRCLED IN 311. YES (USING PILL) ☐↓ NO (USING CONDOM BUT NOT PILL) ☐↓ May I see the package of pills you are using? May I see the package of condoms you are using? RECORD NAME OF BRAND IF PACKAGE SEEN.	PACKAGE SEEN . . . . . 1 ↓ BRAND NAME _____ ☐☐ (SPECIFY) PACKAGE NOT SEEN 2	→ 314
313	Do you know the brand name of the (pills/condoms) you are using? RECORD NAME OF BRAND.	BRAND NAME _____ ☐☐ (SPECIFY) DON'T KNOW 98	
314	How many (pill cycles/condoms) did you get the last time?	NUMBER OF PILL CYCLES/CONDOMS . . . ☐☐☐ DON'T KNOW 998	

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
315	The last time you obtained (HIGHEST METHOD ON LIST IN 311), how much did you pay in total, including the cost of the method and any consultation you may have had?	COST . . . . . ☐☐☐☐ FREE . . . . . 9995 DON'T KNOW 9998	→ 319A
316	In what facility did the sterilization take place? PROBE TO IDENTIFY THE TYPE OF SOURCE AND CIRCLE THE APPROPRIATE CODE. IF UNABLE TO DETERMINE IF HOSPITAL, HEALTH CENTER OR CLINIC IS PUBLIC OR PRIVATE MEDICAL, WRITE THE NAME OF THE PLACE. _____ (NAME OF PLACE)	PUBLIC SECTOR GOVERNMENT HOSPITAL . . . . . 11 GOVT. HEALTH CENTER . . . . . 12 GOVERNMENT DISPENSARY . . . . . 13 OTHER PUBLIC _____ 16 (SPECIFY) PRIVATE MEDICAL SECTOR FAITH-BASED, CHURCH, MISSION HOSPITAL / CLINIC . . . . . 21 FHOK/FPAK HEALTH CENTER/ CLINIC . . . . . 22 PRIVATE HOSPITAL/CLINIC . . . . . 23 NURSING/MATERNITY HOME . . . . . 25 MOBILE CLINIC . . . . . 31 OTHER _____ 96 (SPECIFY) DON'T KNOW 98	
317	CHECK 311/311A: CODE 'A' CIRCLED → Before your sterilization operation, were you told that you would not be able to have any (more) children because of the operation? CODE 'A' NOT CIRCLED → Before the sterilization operation, was your husband/partner told that he would not be able to have any (more) children because of the operation?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	
318	How much did you (your husband/partner) pay in total for the sterilization, including any consultation you (he) may have had?	COST . . . . . ☐☐☐☐ FREE . . . . . 9995 DON'T KNOW 9998	
319	In what month and year was the sterilization performed?		
319A	Since what month and year have you been using (CURRENT METHOD) without stopping? PROBE: For how long have you been using (CURRENT METHOD) now without stopping?	MONTH . . . . . ☐☐ YEAR . . . . . ☐☐☐☐	
320	CHECK 319/319A, 215 AND 230: ANY BIRTH OR PREGNANCY TERMINATION AFTER MONTH AND YEAR OF START OF USE OF CONTRACEPTION IN 319/319A → YES NO → GO BACK TO 319/319A, PROBE AND RECORD MONTH AND YEAR AT START OF CONTINUOUS USE OF CURRENT METHOD (MUST BE AFTER LAST BIRTH OR PREGNANCY TERMINATION).		

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
321	CHECK 319/319A: YEAR IS 2003 OR LATER ENTER CODE FOR METHOD USED IN MONTH OF INTERVIEW IN THE CALENDAR AND IN EACH MONTH BACK TO THE DATE STARTED USING. YEAR IS 2002 OR EARLIER ENTER CODE FOR METHOD USED IN MONTH OF INTERVIEW IN THE CALENDAR AND EACH MONTH BACK TO JANUARY 2003 THEN SKIP TO → 331		
322	I would like to ask you some questions about the times you or your partner may have used a method to avoid getting pregnant during the last few years. USE CALENDAR TO PROBE FOR EARLIER PERIODS OF USE AND NONUSE, STARTING WITH MOST RECENT USE, BACK TO JANUARY 2003. USE NAMES OF CHILDREN, DATES OF BIRTH, AND PERIODS OF PREGNANCY AS REFERENCE POINTS. ENTER METHOD USE CODE OR '0' FOR NONUSE IN EACH BLANK MONTH. ILLUSTRATIVE QUESTIONS: * When was the last time you used a method? Which method was that? * When did you start using that method? How long after the birth of (NAME)? * How long did you use the method then?		
323	CHECK 311/311A: CIRCLE METHOD CODE: IF MORE THAN ONE METHOD CODE CIRCLED IN 311/311A, CIRCLE CODE FOR HIGHEST METHOD IN LIST.	NO CODE CIRCLED . . . . . 00 → 333 FEMALE STERILIZATION . . . . . 01 → 326 MALE STERILIZATION . . . . . 02 → 335 PILL . . . . . 03 IUD . . . . . 04 INJECTABLES . . . . . 05 IMPLANTS . . . . . 06 CONDOM . . . . . 07 FEMALE CONDOM . . . . . 08 LACTATIONAL AMENORRHEA (LAM) 09 → 324A RHYTHM METHOD . . . . . 10 → 324A WITHDRAWAL . . . . . 11 → 335 96 → 335	
324	Where did you obtain (CURRENT METHOD) when you started using it? IF UNABLE TO DETERMINE IF HOSPITAL, HEALTH CENTER OR CLINIC IS PUBLIC OR PRIVATE MEDICAL, WRITE THE NAME OF THE PLACE. _____ (NAME OF PLACE)	PUBLIC SECTOR GOVERNMENT HOSPITAL . . . . . 11 GOVT. HEALTH CENTER . . . . . 12 GOVERNMENT DISPENSARY . . . 13 OTHER PUBLIC _____ 16 (SPECIFY) PRIVATE MEDICAL SECTOR FAITH-BASED, CHURCH, MISSION HOSPITAL / CLINIC . . . . . 21 FHOK/FPAK HEALTH CENTER/ CLINIC . . . . . 22 PRIVATE HOSPITAL/CLINIC . . . . . 23 PHARMACY/CHEMIST . . . . . 24 NURSING/MATERNITY HOME 25	
324A	Where did you learn how to use the rhythm/lactational amenorrhoea method?	OTHER SOURCE MOBILE CLINIC . . . . . 31 COMMUNITY-BASED DISTRIBUTOR 41 SHOP . . . . . 51 FRIEND/RELATIVE . . . . . 61 OTHER _____ 96 (SPECIFY)	

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
325	CHECK 311/311A: CIRCLE METHOD CODE: IF MORE THAN ONE METHOD CODE CIRCLED IN 311/311A, CIRCLE CODE FOR HIGHEST METHOD IN LIST.	PILL . . . . . 03 IUD . . . . . 04 INJECTABLES . . . . . 05 IMPLANTS . . . . . 06 CONDOM . . . . . 07 FEMALE CONDOM . . . . . 08 LACTATIONAL AMENORRHEA (LAM) 09 RHYTHM METHOD 10	→ 332 → 329 → 335 → 335
326	You obtained (CURRENT METHOD FROM 323) from (SOURCE OF METHOD FROM 316 OR 324) in (DATE FROM 319/319A). At that time, were you told about side effects or problems you might have with the method?	YES . . . . . 1 NO 2	→ 328
327	Were you ever told by a health or family planning worker about side effects or problems you might have with the method?	YES . . . . . 1 NO 2	→ 329
328	Were you told what to do if you experienced side effects or problems?	YES . . . . . 1 NO 2	
329	CHECK 326: CODE '1' CIRCLED → At that time, were you told about other methods of family planning that you could use? CODE '1' NOT CIRCLED → When you obtained (CURRENT METHOD FROM 323) from (SOURCE OF METHOD FROM 316 OR 324) were you told about other methods of family planning that you could use?	YES . . . . . 1 NO 2	→ 331
330	Were you ever told by a health or family planning worker about other methods of family planning that you could use?	YES . . . . . 1 NO 2	
331	CHECK 311/311A: CIRCLE METHOD CODE: IF MORE THAN ONE METHOD CODE CIRCLED IN 311/311A, CIRCLE CODE FOR HIGHEST METHOD IN LIST.	FEMALE STERILIZATION . . . . . 01 MALE STERILIZATION . . . . . 02 PILL . . . . . 03 IUD . . . . . 04 INJECTABLES . . . . . 05 IMPLANTS . . . . . 06 CONDOM . . . . . 07 FEMALE CONDOM . . . . . 08 LACTATIONAL AMENORRHEA (LAM) 09 RHYTHM METHOD . . . . . 10 WITHDRAWAL . . . . . 11 OTHER METHOD 96	→ 335 → 335

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
332	Where did you obtain (CURRENT METHOD) the last time? PROBE TO IDENTIFY THE TYPE OF SOURCE AND CIRCLE THE APPROPRIATE CODE. IF UNABLE TO DETERMINE IF HOSPITAL, HEALTH CENTER OR CLINIC IS PUBLIC OR PRIVATE MEDICAL, WRITE THE NAME OF THE PLACE. _____ (NAME OF PLACE)	PUBLIC SECTOR GOVERNMENT HOSPITAL . . . . . 11 GOVT. HEALTH CENTER . . . . . 12 GOVERNMENT DISPENSARY . . . 13 OTHER PUBLIC _____ 16 (SPECIFY) PRIVATE MEDICAL SECTOR FAITH-BASED, CHURCH, MISSION HOSPITAL / CLINIC . . . . . 21 FHOK/FPAK HEALTH CENTER/ CLINIC . . . . . 22 PRIVATE HOSPITAL/CLINIC . . . . . 23 PHARMACY/CHEMIST . . . . . 24 NURSING/MATERNITY HOME . . . . . 25 OTHER PRIV. MEDICAL _____ 26 (SPECIFY) OTHER SOURCE MOBILE CLINIC . . . . . 31 COMMUNITY-BASED DISTRIBUTOR. 41 SHOP . . . . . 51 FRIEND/RELATIVE . . . . . 61 OTHER _____ 96 (SPECIFY)	→ 335
333	Do you know of a place where you can obtain a method of family planning?	YES . . . . . 1 NO 2	→ 335
334	Where is that? Any other place? PROBE TO IDENTIFY EACH TYPE OF SOURCE AND CIRCLE THE APPROPRIATE CODE(S). IF UNABLE TO DETERMINE IF HOSPITAL, HEALTH CENTER OR CLINIC IS PUBLIC OR PRIVATE MEDICAL, WRITE THE NAME OF THE PLACE. _____ (NAME OF PLACE(S))	PUBLIC SECTOR GOVERNMENT HOSPITAL . . . . . B GOVT. HEALTH CENTER . . . . . C GOVERNMENT DISPENSARY . . . . . D OTHER PUBLIC _____ E (SPECIFY) PRIVATE MEDICAL SECTOR FAITH-BASED, CHURCH, MISSION HOSPITAL / CLINIC . . . . . F FHOK/FPAK HEALTH CENTER/ CLINIC . . . . . G PRIVATE HOSPITAL/CLINIC . . . . . H PHARMACY/CHEMIST . . . . . I NURSING/MATERNITY HOME . . . . . J OTHER PRIV. MEDICAL _____ K (SPECIFY) OTHER SOURCE MOBILE CLINIC . . . . . L COMMUNITY-BASED DISTRIBUTOR M SHOP . . . . . N FRIEND/RELATIVE . . . . . P OTHER _____ X (SPECIFY)	
335	In the last 12 months, were you visited by a fieldworker who talked to you about family planning?	YES . . . . . 1 NO 2	
336	In the last 12 months, have you visited a health facility for care for yourself (or your children)?	YES . . . . . 1 NO 2	→ 401
337	Did any staff member at the health facility speak to you about family planning methods?	YES . . . . . 1 NO 2	

SECTION 4. PREGNANCY AND POSTNATAL CARE

401	CHECK 224: ONE OR MORE BIRTHS IN 2003 OR LATER ☐ ↓ NO BIRTHS IN 2003 OR LATER ☐ → 576			
402	CHECK 215: ENTER IN THE TABLE THE LINE NUMBER, NAME, AND SURVIVAL STATUS OF EACH BIRTH IN 2003 OR LATER. ASK THE QUESTIONS ABOUT ALL OF THESE BIRTHS. BEGIN WITH THE LAST BIRTH. (IF THERE ARE MORE THAN 3 BIRTHS, USE LAST 2 COLUMNS OF ADDITIONAL QUESTIONNAIRES). Now I would like to ask you some questions about the health of all your children born in the last five years. (We will talk about each separately.)			
403	LINE NUMBER FROM 212	LAST BIRTH LINE NO. ☐☐	NEXT-TO-LAST BIRTH LINE NO. ☐☐	SECOND-FROM-LAST BIRTH LINE NO. ☐☐
404	FROM 212 AND 216	NAME _____ LIVING ☐ ↓ DEAD ☐ ↓	NAME _____ LIVING ☐ ↓ DEAD ☐ ↓	NAME _____ LIVING ☐ ↓ DEAD ☐ ↓
405	At the time you became pregnant with (NAME), did you want to become pregnant then, did you want to wait until later, or did you not want to have any (more) children at all?	THEN . . . . . 1 (SKIP TO 407) ↵ LATER . . . . . 2 NOT AT ALL . . . . . 3 (SKIP TO 407) ↵	THEN . . . . . 1 (SKIP TO 432) ↵ LATER . . . . . 2 NOT AT ALL . . . . . 3 (SKIP TO 432) ↵	THEN . . . . . 1 (SKIP TO 432) ↵ LATER . . . . . 2 NOT AT ALL . . . . . 3 (SKIP TO 432) ↵
406	How much longer would you have liked to wait?	MONTHS . .1 ☐☐ YEARS . .2 ☐☐ DON'T KNOW . . . 998	MONTHS . .1 ☐☐ YEARS . .2 ☐☐ DON'T KNOW . . . 998	MONTHS . .1 ☐☐ YEARS . .2 ☐☐ DON'T KNOW . . . 998
407	Did you see anyone for antenatal care for this pregnancy? IF YES: Whom did you see? Anyone else? PROBE TO IDENTIFY EACH TYPE OF PERSON AND RECORD ALL MENTIONED.	HEALTH PERSONNEL DOCTOR . . . . . A NURSE/MIDWIFE B OTHER PERSON TRADITIONAL BIRTH ATTENDANT . C COMMUNITY HEALTH WORKER . . . . . D OTHER _____ X (SPECIFY) NO ONE . . . . . Y (SKIP TO 414) ↵		

NO.	QUESTIONS AND FILTERS	LAST BIRTH NAME _____	NEXT-TO-LAST BIRTH NAME _____	SECOND-FROM-LAST BIRTH NAME _____
408	Where did you receive antenatal care for this pregnancy? Anywhere else? PROBE TO IDENTIFY TYPE(S) OF SOURCE(S) AND CIRCLE THE APPROPRIATE CODE(S). IF UNABLE TO DETERMINE IF A HOSPITAL, HEALTH CENTER, OR CLINIC IS PUBLIC OR PRIVATE MEDICAL, WRITE THE THE NAME OF THE PLACE. _____ (NAME OF PLACE(S))	HOME . . . . . A PUBLIC SECTOR GOV. HOSPITAL B GOV. HEALTH CTR C GOV. DISPENSARY D OTHER PUBLIC _____ (SPECIFY) E PRIVATE MED SECTOR FAITH-BASED, CHURCH HOSP./CLINIC . F PRIVATE HOSPITAL/ CLINIC . . . . . H NURSING/MATERNITY HOME . . . . . J OTHER PVT. MED. _____ (SPECIFY) K OTHER_____ X (SPECIFY)		
409	How many months pregnant were you when you first received antenatal care for this pregnancy?	MONTHS . . . ☐☐ DON'T KNOW 98		
410	How many times did you receive antenatal care during this pregnancy?	NUMBER OF TIMES . ☐☐ DON'T KNOW 98		
411	As part of your antenatal care during this pregnancy, were any of the following done at least once?	YES NO		
	Were you weighed?	WEIGHT . . . 1 2		
	Was your height measured?	HEIGHT . . . 1 2		
	Was your blood pressure taken?	BP 1 2		
	Did you give a urine sample?	URINE 1 2		
	Did you give a blood sample?	BLOOD . . . 1 2		
412	Were you given any information or counselled about breast-feeding?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8		
412A	During (any of) your antenatal care visit(s), were you told about the signs of pregnancy complications?	YES . . . . . 1 NO . . . . . 2 (SKIP TO 414) ←┤ DON'T KNOW 8		
413	Were you told where to go if you had any of these complications?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8		
414	During this pregnancy, were you given an injection in the arm to prevent the baby from getting tetanus, that is, convulsions after birth?	YES . . . . . 1 NO . . . . . 2 (SKIP TO 417) ←┤ DON'T KNOW 8		

NO.	QUESTIONS AND FILTERS	LAST BIRTH NAME _____	NEXT-TO-LAST BIRTH NAME _____	SECOND-FROM-LAST BIRTH NAME _____
415	During this pregnancy, how many times did you get this tetanus injection?	TIMES . . . . . ☐ DON'T KNOW . . . 8		
416	CHECK 415:	2 OR MORE TIMES ☐ → (SKIP TO 421) OTHER ☐ →		
417	At any time before this pregnancy, did you receive any tetanus injections, either to protect yourself or another baby?	YES . . . . . 1 NO . . . . . 2 (SKIP TO 421) ← DON'T KNOW 8		
418	Before this pregnancy, how many other times did you receive a tetanus injection? IF 7 OR MORE TIMES, WRITE '7'.	TIMES . . . . . ☐ DON'T KNOW . . . 8		
419	In what month and year did you receive the last tetanus injection before this pregnancy?	MONTH . . . ☐☐ DK MONTH . . . . . 98 YEAR ☐☐☐☐ (SKIP TO 421) ← DK YEAR 9998		
420	How many years ago did you receive that tetanus injection?	YEARS AGO . . . . . ☐☐		
421	During this pregnancy, were you given or did you buy any iron tablets or iron syrup? SHOW TABLETS/SYRUP.	YES . . . . . 1 NO . . . . . 2 (SKIP TO 423) ← DON'T KNOW 8		
422	During the whole pregnancy, for how many days did you take the tablets or syrup? IF ANSWER IS NOT NUMERIC, PROBE FOR APPROXIMATE NUMBER OF DAYS.	DAYS . ☐☐☐ DON'T KNOW . . . 998		
423	During this pregnancy, did you take any drug for intestinal worms?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8		
424	During this pregnancy, did you have difficulty with your vision during daylight?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8		
425	During this pregnancy, did you suffer from night blindness?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8		

NO.	QUESTIONS AND FILTERS	LAST BIRTH NAME ______	NEXT-TO-LAST BIRTH NAME ______	SECOND-FROM-LAST BIRTH NAME ______
426	During this pregnancy, did you take any drugs to keep you from getting malaria?	YES . . . . 1 NO . . . . 2 (SKIP TO 432) DON'T KNOW 8		
427	What drugs did you take? RECORD ALL MENTIONED. IF TYPE OF DRUG IS NOT DETERMINED, SHOW TYPICAL ANTIMALARIAL DRUGS TO RESPONDENT.	SP/FANSIDAR . . . . . A CHLOROQUINE . . . B OTHER ______ X (SPECIFY) DON'T KNOW . . . . . . Z		
428	CHECK 427: DRUGS TAKEN FOR MALARIA PREVENTION.	CODE 'A' CIRCLED ☐ CODE 'A' NOT CIRCLED ☐ (SKIP TO 432)		
429	How many times did you take (SP/Fansidar) during this pregnancy?	TIMES . . . . . [ ][ ]		
430	CHECK 407: ANTENATAL CARE FROM HEALTH PERSONNEL DURING THIS PREGNANCY	CODE 'A' OR 'B' CIRCLED ☐ OTHER ☐ (SKIP TO 432)		
431	Did you get the (SP/Fansidar) during any antenatal care visit, during another visit to a health facility or from another source?	ANTENATAL VISIT . . 1 ANOTHER FACILITY VISIT . . . . 2 OTHER SOURCE 6		
432	When (NAME) was born, was he/she very large, larger than average, average, smaller than average, or very small?	VERY LARGE . . . . . 1 LARGER THAN AVERAGE . . . . . 2 AVERAGE . . . . 3 SMALLER THAN AVERAGE . . . . . 4 VERY SMALL . . . . . 5 DON'T KNOW 8	VERY LARGE . . . . . 1 LARGER THAN AVERAGE . . . . . 2 AVERAGE . . . . 3 SMALLER THAN AVERAGE . . . . . 4 VERY SMALL . . . . . 5 DON'T KNOW 8	VERY LARGE . . . . . 1 LARGER THAN AVERAGE . . . . . 2 AVERAGE . . . . 3 SMALLER THAN AVERAGE . . . . . 4 VERY SMALL . . . . . 5 DON'T KNOW 8
433	Was (NAME) weighed at birth?	YES . . . . 1 NO . . . . 2 (SKIP TO 435) DON'T KNOW 8	YES . . . . 1 NO . . . . 2 (SKIP TO 435) DON'T KNOW 8	YES . . . . 1 NO . . . . 2 (SKIP TO 435) DON'T KNOW 8
434	How much did (NAME) weigh? RECORD WEIGHT IN KILOGRAMS FROM HEALTH CARD, IF AVAILABLE.	KG FROM CARD 1 [ ] . [ ][ ][ ] KG FROM RECALL 2 [ ] . [ ][ ][ ] DON'T KNOW . 99.998	KG FROM CARD 1 [ ] . [ ][ ][ ] KG FROM RECALL 2 [ ] . [ ][ ][ ] DON'T KNOW . 99.998	KG FROM CARD 1 [ ] . [ ][ ][ ] KG FROM RECALL 2 [ ] . [ ][ ][ ] DON'T KNOW . 99.998

<table>
<tr><th>NO.</th><th>QUESTIONS AND FILTERS</th><th>LAST BIRTH
NAME ________</th><th>NEXT-TO-LAST BIRTH
NAME ________</th><th>SECOND-FROM-LAST BIRTH
NAME ________</th></tr>
<tr><td>435</td><td>Who assisted with the delivery of (NAME)?

Anyone else?
PROBE FOR THE TYPE(S) OF PERSON(S) AND RECORD ALL MENTIONED.

IF RESPONDENT SAYS NO ONE ASSISTED, PROBE TO SEE IF ANY ADULTS WERE PRESENT AT THE DELIVERY.</td><td>HEALTH PERSONNEL
DOCTOR . . . . . A
NURSE/MIDWIFE . B
OTHER PERSON
TRADITIONAL BIRTH ATTENDANT . . C
COMMUNITY HLTH WORKER . . . D
RELATIVE/FRIEND E
OTHER ________ X
(SPECIFY)
NO ONE . . . . Y</td><td>HEALTH PERSONNEL
DOCTOR . . . . . A
NURSE/MIDWIFE . B
OTHER PERSON
TRADITIONAL BIRTH ATTENDANT . . C
COMMUNITY HLTH WORKER . . . D
RELATIVE/FRIEND . E
OTHER ________ X
(SPECIFY)
NO ONE . . . . Y</td><td>HEALTH PERSONNEL
DOCTOR . . . . . A
NURSE/MIDWIFE . B
OTHER PERSON
TRADITIONAL BIRTH ATTENDANT . . C
COMMUNITY HLTH WORKER . . . D
RELATIVE/FRIEND E
OTHER ________ X
(SPECIFY)
NO ONE . . . . Y</td></tr>
<tr><td>436</td><td>Where did you give birth to (NAME)?

PROBE TO IDENTIFY THE TYPE OF SOURCE AND CIRCLE THE APPROPRIATE CODE.

IF UNABLE TO DETERMINE IF A HOSPITAL, HEALTH CENTER, OR CLINIC IS PUBLIC OR PRIVATE MEDICAL, WRITE THE THE NAME OF THE PLACE.

____
(NAME OF PLACE)</td><td>HOME
YOUR HOME . . . 11
(SKIP TO 443)
OTHER HOME . . . 12

PUBLIC SECTOR
GOVT. HOSPITAL 21
GOVT. HEALTH CENTER 22
GOVT. DIS-PENSARY . . . 23
OTHER PUBLIC ________ 26
(SPECIFY)

PRIVATE MED. SECTOR
MISSION HOSPITAL/ CLINIC 31
PVT. HOSPITAL/ CLINIC 33
NURSING/MATERNITY HOME 35
OTHER PRIVATE MED. ________ 36
(SPECIFY)

OTHER ________ 96
(SPECIFY)
(SKIP TO 443)</td><td>HOME
YOUR HOME . . . 11
(SKIP TO 444)
OTHER HOME . . . 12

PUBLIC SECTOR
GOVT. HOSPITAL 21
GOVT. HEALTH CENTER 22
GOVT. DIS-PENSARY . . . 23
OTHER PUBLIC ________ 26
(SPECIFY)

PRIVATE MED. SECTOR
MISSION HOSPITAL/ CLINIC 31
PVT. HOSPITAL/ CLINIC 33
NURSING/MATERNITY HOME 35
OTHER PRIVATE MED. ________ 36
(SPECIFY)

OTHER ________ 96
(SPECIFY)
(SKIP TO 444)</td><td>HOME
YOUR HOME . . . 11
(SKIP TO 444)
OTHER HOME . . . 12

PUBLIC SECTOR
GOVT. HOSPITAL 21
GOVT. HEALTH CENTER 22
GOVT. DIS-PENSARY . . . 23
OTHER PUBLIC ________ 26
(SPECIFY)

PRIVATE MED. SECTOR
MISSION HOSPITAL/ CLINIC 31
PVT. HOSPITAL/ CLINIC 33
NURSING/MATERNITY HOME 35
OTHER PRIVATE MED. ________ 36
(SPECIFY)

OTHER ________ 96
(SPECIFY)
(SKIP TO 444)</td></tr>
<tr><td>437</td><td>How long after (NAME) was delivered did you stay there?

IF LESS THAN ONE DAY, RECORD HOURS.
IF LESS THAN ONE WEEK, RECORD DAYS.</td><td>HOURS 1 [ ][ ]
DAYS 2 [ ][ ]
WEEKS 3 [ ][ ]
DON'T KNOW . 998</td><td>HOURS 1 [ ][ ]
DAYS 2 [ ][ ]
WEEKS 3 [ ][ ]
DON'T KNOW . . . 998</td><td>HOURS 1 [ ][ ]
DAYS 2 [ ][ ]
WEEKS 3 [ ][ ]
DON'T KNOW . . . 998</td></tr>
<tr><td>438</td><td>Was (NAME) delivered by caesarean section?</td><td>YES 1
NO . . . . 2</td><td>YES 1
NO . . . . 2</td><td>YES 1
NO . . . . 2</td></tr>
<tr><td>439</td><td>Before you were discharged after (NAME) was born, did any health care provider check on your health?</td><td>YES 1
NO 2
(SKIP TO 442)</td><td>YES 1
(SKIP TO 455)
NO . . . . 2</td><td>YES 1
(SKIP TO 455)
NO . . . . 2</td></tr>
</table>

NO.	QUESTIONS AND FILTERS	LAST BIRTH NAME _____	NEXT-TO-LAST BIRTH NAME _____	SECOND-FROM-LAST BIRTH NAME _____
440	How long after delivery did the first check take place? IF LESS THAN ONE DAY, RECORD HOURS. IF LESS THAN ONE WEEK, RECORD DAYS.	HOURS 1 DAYS 2 WEEKS 3 DON'T KNOW . . . 998		
441	Who checked on your health at that time? PROBE FOR MOST QUALIFIED PERSON.	HEALTH PERSONNEL DOCTOR . . . . . 11 NURSE/MIDWIFE 12 OTHER PERSON TRADITIONAL BIRTH ATTENDANT . 21 COMMUNITY HLTH WORKER . . . 22 OTHER _____ 96 (SPECIFY) (SKIP TO 453)		
442	After you were discharged, did any health care provider or a traditional birth attendant check on your health?	YES . . . . . 1 (SKIP TO 445) NO . . . . . 2 (SKIP TO 453)	YES . . . . . 1 (SKIP TO 455) NO 2	YES . . . . . 1 (SKIP TO 455) NO 2
443	Why didn't you deliver in a health facility? PROBE: Any other reason? RECORD ALL MENTIONED.	COST TOO MUCH . . A FACILITY NOT OPEN . B TOO FAR/ NO TRANS-PORTATION C DON'T TRUST FACILITY/POOR QUALITY SERVICE D NO FEMALE PROVID-ER AT FACILITY . . E HUSBAND/FAMILY DID NOT ALLOW . . F NOT NECESSARY . . G NOT CUSTOMARY . . H OTHER _____ X (SPECIFY)		
444	After (NAME) was born, did any health care provider or a traditional birth attendant check on your health?	YES . . . . . 1 NO . . . . . 2 (SKIP TO 449)	YES . . . . . 1 NO 2	YES . . . . . 1 NO 2
445	How long after delivery did the first check take place? IF LESS THAN ONE DAY, RECORD HOURS. IF LESS THAN ONE WEEK, RECORD DAYS.	HOURS 1 DAYS 2 WEEKS 3 DON'T KNOW . . . 998		

NO.	QUESTIONS AND FILTERS	LAST BIRTH NAME _____	NEXT-TO-LAST BIRTH NAME _____	SECOND-FROM-LAST BIRTH NAME _____
446	Who checked on your health at that time? PROBE FOR MOST QUALIFIED PERSON.	HEALTH PERSONNEL DOCTOR . . . . . 11 NURSE/MIDWIFE 12 OTHER PERSON TRADITIONAL BIRTH ATTENDANT . 21 COMMUNITY HLTH WORKER . . . 22 OTHER _____ 96 (SPECIFY)		
447	Where did this first check take place? PROBE TO IDENTIFY THE TYPE OF SOURCE AND CIRCLE THE APPROPRIATE CODE. IF UNABLE TO DETERMINE IF A HOSPITAL, HEALTH CENTER, OR CLINIC IS PUBLIC OR PRIVATE MEDICAL, WRITE THE THE NAME OF THE PLACE. _____ (NAME OF PLACE)	HOME YOUR HOME . . . 11 OTHER HOME . . . 12 PUBLIC SECTOR GOVT. HOSPITAL 21 GOVT. HEALTH CENTER . . . . . 22 GOVT. DISPENSARY . . . 23 OTHER PUBLIC _____ 26 (SPECIFY) PRIVATE MED. SECTOR MISSION HOSPITAL/ CLINIC . . . . . 31 PVT. HOSPITAL/ CLINIC . . . . . 33 NURSING/MATERNITY HOME . . . . . 35 OTHER PRIVATE MED. _____ 36 (SPECIFY) OTHER _____ 96 (SPECIFY)		
448	CHECK 442:	YES ☐ → (SKIP TO 453) NOT ASKED ☐ →		
449	In the two months after (NAME) was born, did any health care provider or a traditional birth attendant check on his/her health?	YES . . . . . 1 NO . . . . . 2 (SKIP TO 453) ← DON'T KNOW 8		
450	How many hours, days or weeks after the birth of (NAME) did the first check take place? IF LESS THAN ONE DAY, RECORD HOURS. IF LESS THAN ONE WEEK, RECORD DAYS.	HOURS 1 ☐☐ DAYS 2 ☐☐ WEEKS 3 ☐☐ DON'T KNOW . . . 998		

NO.	QUESTIONS AND FILTERS	LAST BIRTH NAME _____	NEXT-TO-LAST BIRTH NAME _____	SECOND-FROM-LAST BIRTH NAME _____
451	Who checked on (NAME)'s health at that time? PROBE FOR MOST QUALIFIED PERSON.	HEALTH PERSONNEL DOCTOR . . . . . 11 NURSE/MIDWIFE 12 OTHER PERSON TRADITIONAL BIRTH ATTENDANT . 21 COMMUNITY HLTH WORKER . . . 22 OTHER _____ 96 (SPECIFY)		
452	Where did this first check of (NAME) take place? PROBE TO IDENTIFY THE TYPE OF SOURCE AND CIRCLE THE APPROPRIATE CODE. IF UNABLE TO DETERMINE IF A HOSPITAL, HEALTH CENTER, OR CLINIC IS PUBLIC OR PRIVATE MEDICAL, WRITE THE THE NAME OF THE PLACE. _____ (NAME OF PLACE)	HOME YOUR HOME . . . 11 OTHER HOME . . . 12 PUBLIC SECTOR GOVT. HOSPITAL 21 GOVT. HEALTH CENTER . . . . . 22 GOVT. DISPENSARY . . . 23 OTHER PUBLIC _____ 26 (SPECIFY) PRIVATE MED. SECTOR FAITH-BASED, CHURCH HOSP/CLINIC . 31 PVT. HOSPITAL/ CLINIC . . . . . 33 NURSING/MATERNITY HOME . . . . . 35 OTHER PRIVATE MED. _____ 36 (SPECIFY) OTHER _____ 96 (SPECIFY)		
453	In the first two months after delivery, did you receive a vitamin A dose (like this)? SHOW COMMON TYPES OF AMPULES/CAPSULES/SYRUPS.	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8		
454	Has your menstrual period returned since the birth of (NAME)?	YES . . . . . 1 (SKIP TO 456)← NO . . . . . 2 (SKIP TO 457)←		
455	Did your period return between the birth of (NAME) and your next pregnancy?		YES . . . . . 1 NO . . . . . 2 (SKIP TO 459)←	YES . . . . . 1 NO . . . . . 2 (SKIP TO 459)←
456	For how many months after the birth of (NAME) did you <u>not</u> have a period?	MONTHS . . . ☐☐ DON'T KNOW 98	MONTHS . . . ☐☐ DON'T KNOW 98	MONTHS . . . ☐☐ DON'T KNOW 98

NO.	QUESTIONS AND FILTERS	LAST BIRTH NAME _____	NEXT-TO-LAST BIRTH NAME _____	SECOND-FROM-LAST BIRTH NAME _____
457	CHECK 226: IS RESPONDENT PREGNANT?	NOT PREG-NANT ☐ PREGNANT OR UNSURE ☐ (SKIP TO 459)		
458	Have you begun to have sexual intercourse again since the birth of (NAME)?	YES . . . . . 1 NO . . . . . 2 (SKIP TO 460)		
459	For how many months after the birth of (NAME) did you not have sexual intercourse?	MONTHS . . . ☐☐ DON'T KNOW 98	MONTHS . . . ☐☐ DON'T KNOW 98	MONTHS . . . ☐☐ DON'T KNOW 98
460	Did you ever breastfeed (NAME)?	YES . . . . . 1 NO . . . . . 2 (SKIP TO 467)	YES . . . . . 1 NO . . . . . 2 (SKIP TO 467)	YES . . . . . 1 NO . . . . . 2 (SKIP TO 467)
461	How long after birth did you first put (NAME) to the breast? IF LESS THAN 1 HOUR, RECORD '00' HOURS. IF LESS THAN 24 HOURS, RECORD HOURS. OTHERWISE, RECORD DAYS.	IMMEDIATELY . . . 000 HOURS 1 ☐☐ DAYS 2 ☐☐		
462	In the first three days after delivery, was (NAME) given anything to drink other than breast milk?	YES . . . . . 1 NO . . . . . 2 (SKIP TO 464)		
463	What was (NAME) given to drink? Anything else? RECORD ALL LIQUIDS MENTIONED.	MILK (OTHER THAN BREAST MILK) . A PLAIN WATER . . . B SUGAR OR GLU-COSE WATER . . . C GRIPE WATER . . . D SUGAR-SALT-WATER SOLUTION . . . . . E FRUIT JUICE . . . . . F INFANT FORMULA . G TEA/INFUSIONS . . . H HONEY . . . . . I OTHER _____ X (SPECIFY)		
464	CHECK 404: IS CHILD LIVING?	LIVING ☐ DEAD ☐ (SKIP TO 466)		
465	Are you still breastfeeding (NAME)?	YES . . . . . 1 (SKIP TO 468) NO 2		
466	For how many months did you breastfeed (NAME)?	MONTHS . . . ☐☐ DON'T KNOW . . . 98	MONTHS . . . ☐☐ STILL BF . . . . . 95 DON'T KNOW . . . 98	MONTHS . . . ☐☐ STILL BF . . . . . 95 DON'T KNOW . . . 98

NO.	QUESTIONS AND FILTERS	LAST BIRTH NAME _____	NEXT-TO-LAST BIRTH NAME _____	SECOND-FROM-LAST BIRTH NAME _____
467	CHECK 404: IS CHILD LIVING?	LIVING → (SKIP TO 470) DEAD → (GO BACK TO 405 IN NEXT COLUMN; OR, IF NO MORE BIRTHS, GO TO 501)	LIVING → (SKIP TO 470) DEAD → (GO BACK TO 405 IN NEXT COLUMN; OR, IF NO MORE BIRTHS, GO TO 501)	LIVING → (SKIP TO 470) DEAD → (GO BACK TO 405 IN NEXT-TO-LAST COLUMN OF NEW QUESTIONNAIRE; OR, IF NO MORE BIRTHS, GO TO 501)
468	How many times did you breastfeed last night between sunset and sunrise? IF ANSWER IS NOT NUMERIC, PROBE FOR APPROXIMATE NUMBER.	NUMBER OF NIGHTTIME FEEDINGS . ☐☐		
469	How many times did you breastfeed yesterday during the daylight hours? IF ANSWER IS NOT NUMERIC, PROBE FOR APPROXIMATE NUMBER.	NUMBER OF DAYLIGHT FEEDINGS . ☐☐		
470	Did (NAME) drink anything from a bottle with a nipple yesterday or last night?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8
471		GO BACK TO 405 IN NEXT COLUMN; OR, IF NO MORE BIRTHS, GO TO 501.	GO BACK TO 405 IN NEXT COLUMN; OR, IF NO MORE BIRTHS, GO TO 501.	GO BACK TO 405 IN NEXT-TO-LAST COLUMN OF NEW QUESTIONNAIRE; OR, IF NO MORE BIRTHS, GO TO 501.

SECTION 5. IMMUNIZATION, HEALTH AND NUTRITION

501 ENTER IN THE TABLE THE LINE NUMBER, NAME, AND SURVIVAL STATUS OF EACH BIRTH IN 2003 OR LATER.
ASK THE QUESTIONS ABOUT ALL OF THESE BIRTHS. BEGIN WITH THE LAST BIRTH.
(IF THERE ARE MORE THAN 3 BIRTHS, USE LAST 2 COLUMNS OF ADDITIONAL QUESTIONNAIRES).

		LAST BIRTH	NEXT-TO-LAST BIRTH	SECOND-FROM-LAST BIRTH
502	LINE NUMBER FROM 212	LINE NUMBER	LINE NUMBER	LINE NUMBER . . . . .
503	FROM 212 AND 216	NAME _____ LIVING / DEAD → (GO TO 503 IN NEXT COLUMN OR, IF NO MORE BIRTHS, GO TO 573)	NAME _____ LIVING / DEAD → (GO TO 503 IN NEXT COLUMN OR, IF NO MORE BIRTHS, GO TO 573)	NAME _____ LIVING / DEAD → (GO TO 503 IN NEXT-TO-LAST COLUMN OF NEW QUESTIONNAIRE, OR IF NO MORE BIRTHS, GO TO 573)
504	Do you have a child welfare card with (NAME)'s vaccinations? IF YES: May I see it please?	YES, SEEN . . . . . 1 (SKIP TO 506) ← YES, NOT SEEN . . . . . 2 (SKIP TO 508) ← NO CARD 3	YES, SEEN . . . . . 1 (SKIP TO 506) ← YES, NOT SEEN . . . . . 2 (SKIP TO 508) ← NO CARD 3	YES, SEEN . . . . . 1 (SKIP TO 506) ← YES, NOT SEEN . . . . . 2 (SKIP TO 508) ← NO CARD 3
505	Did you ever have a vaccination card for (NAME)?	YES . . . . . 1 (SKIP TO 508) ← NO 2	YES . . . . . 1 (SKIP TO 508) ← NO 2	YES . . . . . 1 (SKIP TO 508) ← NO 2

506 (1) COPY VACCINATION DATE FOR EACH VACCINE FROM THE CARD.
(2) WRITE '44' IN 'DAY' COLUMN IF CARD SHOWS THAT A VACCINATION WAS GIVEN, BUT NO DATE IS RECORDED.
(3) IF MORE THAN TWO VITAMIN 'A' DOSES, RECORD DATES FOR MOST RECENT AND SECOND MOST RECENT DOSES.

	LAST BIRTH DAY	LAST BIRTH MONTH	LAST BIRTH YEAR		NEXT-TO-LAST BIRTH DAY	NEXT-TO-LAST BIRTH MONTH	NEXT-TO-LAST BIRTH YEAR		SECOND-FROM-LAST BIRTH DAY	SECOND-FROM-LAST BIRTH MONTH	SECOND-FROM-LAST BIRTH YEAR
BCG				BCG				BCG			
DPT, HEPATITIS, HIB, 1st DOSE				D1				D1			
DPT, HEPATITIS, HIB, 2nd DOSE				D2				D2			
DPT, HEPATITIS, HIB, 3rd DOSE				D3				D3			
POLIO 0 (POLIO GIVEN AT BIRTH)				P0				P0			
OPV 1				P1				P1			
OPV 2				P2				P2			
OPV 3				P3				P3			
MEASLES				MEA				MEA			
VITAMIN A (MOST RECENT)				VIT A				VIT A			
VITAMIN A (2nd MOST RECENT)				VIT A				VIT A			
YELLOW FEVER											

506A	CHECK 506:	BCG TO MEASLES ALL RECORDED → (GO TO 510) / OTHER	BCG TO MEASLES ALL RECORDED → (GO TO 510) / OTHER	BCG TO MEASLES ALL RECORDED → (GO TO 510) / OTHER

NO.	QUESTIONS AND FILTERS	LAST BIRTH NAME ________	NEXT-TO-LAST BIRTH NAME ________	SECOND-FROM-LAST BIRTH NAME ________
507	Has (NAME) received any vaccinations that are not recorded on this card, including vaccinations received in a national immunization day campaign? RECORD 'YES' ONLY IF RESPONDENT MENTIONS BCG, POLIO 0-3, DPT 1-3, AND/OR MEASLES VACCINES.	YES . . . . 1 (PROBE FOR VACCINATIONS AND WRITE '66' IN THE CORRESPONDING DAY COLUMN IN 506) (SKIP TO 510) NO . . . . 2 (SKIP TO 510) DON'T KNOW 8	YES . . . . 1 (PROBE FOR VACCINATIONS AND WRITE '66' IN THE CORRESPONDING DAY COLUMN IN 506) (SKIP TO 510) NO . . . . 2 (SKIP TO 510) DON'T KNOW 8	YES . . . . 1 (PROBE FOR VACCINATIONS AND WRITE '66' IN THE CORRESPONDING DAY COLUMN IN 506) (SKIP TO 510) NO . . . . 2 (SKIP TO 510) DON'T KNOW 8
508	Did (NAME) ever receive any vaccinations to prevent him/her from getting diseases, including vaccinations received in a national immunization campaign?	YES . . . . 1 NO . . . . 2 (SKIP TO 512) DON'T KNOW 8	YES . . . . 1 NO . . . . 2 (SKIP TO 512) DON'T KNOW 8	YES . . . . 1 NO . . . . 2 (SKIP TO 512) DON'T KNOW 8
509	Please tell me if (NAME) received any of the following vaccinations:			
509A	A BCG vaccination against tuberculosis, that is, an injection in the arm or shoulder that usually causes a scar?	YES . . . . 1 NO . . . . 2 DON'T KNOW 8	YES . . . . 1 NO . . . . 2 DON'T KNOW 8	YES . . . . 1 NO . . . . 2 DON'T KNOW 8
509B	Polio vaccine, that is, drops in the mouth?	YES . . . . 1 NO . . . . 2 (SKIP TO 509E) DON'T KNOW 8	YES . . . . 1 NO . . . . 2 (SKIP TO 509E) DON'T KNOW 8	YES . . . . 1 NO . . . . 2 (SKIP TO 509E) DON'T KNOW 8
509C	Was the first polio vaccine received in the first two weeks after birth or later?	FIRST 2 WEEKS . . . 1 LATER 2	FIRST 2 WEEKS . . . 1 LATER 2	FIRST 2 WEEKS . . . 1 LATER 2
509D	How many times was the polio vaccine received?	NUMBER OF TIMES . . . . . ☐	NUMBER OF TIMES . . . . . ☐	NUMBER OF TIMES . . . . . ☐
509E	A Pentavalent vaccination, that is an injection given in the thigh, sometimes at the same time as polio drops?	YES . . . . 1 NO . . . . 2 (SKIP TO 509G) DON'T KNOW 8	YES . . . . 1 NO . . . . 2 (SKIP TO 509G) DON'T KNOW 8	YES . . . . 1 NO . . . . 2 (SKIP TO 509G) DON'T KNOW 8
509F	How many times was a Penta valent vaccination received?	NUMBER OF TIMES . . . . . ☐	NUMBER OF TIMES . . . . . ☐	NUMBER OF TIMES . . . . . ☐
509G	A measles injection- that is , a shot in the right upper arm at the age of 9 months or older - to prevent him/her from getting measles?	YES . . . . 1 NO . . . . 2 DON'T KNOW 8	YES . . . . 1 NO . . . . 2 DON'T KNOW 8	YES . . . . 1 NO . . . . 2 DON'T KNOW 8
510	Were any of the vaccinations (NAME) received during the last two years given as part of a national immunization day campaign?	YES . . . . 1 NO . . . . 2 NO VACCINATION IN THE LAST 2 YRS. 3 DON'T KNOW . . . 8	YES . . . . 1 NO . . . . 2 NO VACCINATION IN THE LAST 2 YRS. 3 DON'T KNOW . . . 8	YES . . . . 1 NO . . . . 2 NO VACCINATION IN THE LAST 2 YRS. 3 DON'T KNOW . . . 8

NO.	QUESTIONS AND FILTERS	LAST BIRTH NAME _____	NEXT-TO-LAST BIRTH NAME _____	SECOND-FROM-LAST BIRTH NAME _____
512	CHECK 506: DATE SHOWN FOR VITAMIN A DOSE	DATE FOR MOST RECENT VITAMIN A DOSE OTHER (SKIP TO 514)	DATE FOR MOST RECENT VITAMIN A DOSE OTHER (SKIP TO 514)	DATE FOR MOST RECENT VITAMIN A DOSE OTHER (SKIP TO 514)
513	According to (NAME)'s health card, he/she received a vitamin A dose (like this/any of these) in (MONTH AND YEAR OF MOST RECENT DOSE FROM CARD). Has (NAME) received another vitamin A dose since then? SHOW COMMON TYPES OF AMPULES/CAPSULES/SYRUPS.	YES . . . . . 1 (SKIP TO 515) NO . . . . . 2 (SKIP TO 516) DON'T KNOW 8	YES . . . . . 1 (SKIP TO 515) NO . . . . . 2 (SKIP TO 516) DON'T KNOW 8	YES . . . . . 1 (SKIP TO 515) NO . . . . . 2 (SKIP TO 516) DON'T KNOW 8
514	HAS (NAME) ever received a vitamin A dose (like this/any of these)? SHOW COMMON TYPES OF AMPULES/CAPSULES/SYRUPS.	YES . . . . . 1 NO . . . . . 2 (SKIP TO 516) DON'T KNOW 8	YES . . . . . 1 NO . . . . . 2 (SKIP TO 516) DON'T KNOW 8	YES . . . . . 1 NO . . . . . 2 (SKIP TO 516) DON'T KNOW 8
515	Did (NAME) receive a vitamin A dose within the last six months?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8
516	In the last seven days, did (NAME) take iron pills, sprinkles with iron, or iron syrup (like this/any of these)? SHOW COMMON TYPES OF PILLS/SPRINKLES/SYRUPS	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8
517	Has (NAME) taken any drug for intestinal worms in the last six months?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8
518	Has (NAME) had diarrhoea in the last 2 weeks?	YES . . . . . 1 NO . . . . . 2 (SKIP TO 533) DON'T KNOW 8	YES . . . . . 1 NO . . . . . 2 (SKIP TO 533) DON'T KNOW 8	YES . . . . . 1 NO . . . . . 2 (SKIP TO 533) DON'T KNOW 8
519	Was there any blood in the stools?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8
520	Now I would like to know how much (NAME) was given to drink during the diarrhoea (including breastmilk). Was he/she given less than usual to drink, about the same amount, or more than usual to drink? IF LESS, PROBE: Was he/she given much less than usual to drink or somewhat less?	MUCH LESS . . . . . 1 SOMEWHAT LESS . 2 ABOUT THE SAME . 3 MORE . . . . . 4 NOTHING TO DRINK 5 DON'T KNOW 8	MUCH LESS . . . . . 1 SOMEWHAT LESS . 2 ABOUT THE SAME . 3 MORE . . . . . 4 NOTHING TO DRINK 5 DON'T KNOW 8	MUCH LESS . . . . . 1 SOMEWHAT LESS . 2 ABOUT THE SAME . 3 MORE . . . . . 4 NOTHING TO DRINK 5 DON'T KNOW 8

NO.	QUESTIONS AND FILTERS	LAST BIRTH NAME ________	NEXT-TO-LAST BIRTH NAME ________	SECOND-FROM-LAST BIRTH NAME ________
521	When (NAME) had diarrhoea, was he/she given less than usual to eat, about the same amount, more than usual, or nothing to eat? IF LESS, PROBE: Was he/she given much less than usual to eat or somewhat less?	MUCH LESS . . . . . 1 SOMEWHAT LESS . 2 ABOUT THE SAME . 3 MORE . . . . 4 STOPPED FOOD . 5 NEVER GAVE FOOD 6 DON'T KNOW 8	MUCH LESS . . . . . 1 SOMEWHAT LESS . 2 ABOUT THE SAME . 3 MORE . . . . 4 STOPPED FOOD . 5 NEVER GAVE FOOD 6 DON'T KNOW 8	MUCH LESS . . . . . 1 SOMEWHAT LESS . 2 ABOUT THE SAME . 3 MORE . . . . 4 STOPPED FOOD . 5 NEVER GAVE FOOD 6 DON'T KNOW 8
522	Did you seek advice or treatment for the diarrhoea from any source?	YES . . . . 1 NO . . . . 2 (SKIP TO 527)	YES . . . . 1 NO . . . . 2 (SKIP TO 527)	YES . . . . 1 NO . . . . 2 (SKIP TO 527)
523	Where did you seek advice or treatment? Anywhere else? PROBE TO IDENTIFY EACH TYPE OF SOURCE AND CIRCLE THE APPROPRIATE CODE(S). IF UNABLE TO DETERMINE IF A HOSPITAL, HEALTH CENTER, OR CLINIC IS PUBLIC OR PRIVATE MEDICAL, WRITE THE THE NAME OF THE PLACE. ________ (NAME OF PLACE(S))	PUBLIC SECTOR GOVT HOSPITAL B GOVT HEALTH CENTER . . . . . C GOVT DISPENS- ARY . . . . D OTHER PUBLIC ________ E (SPECIFY) PRIVATE MEDICAL SECTOR MISSION HOSP./ CLINIC . . . . F PVT. HOSPITAL/ CLINIC . . . . H PHARMACY . . . I OTHER PRIVATE MED. ________ K (SPECIFY) MOBILE CLINIC . . . L COMMUNITY HEALTH WORKER . . . . M OTHER SOURCE SHOP . . . . N TRADITIONAL PRACTITIONER O RELATIVE/FRIEND P OTHER ________ X (SPECIFY)	PUBLIC SECTOR GOVT HOSPITAL B GOVT HEALTH CENTER . . . . . C GOVT DISPENS- ARY . . . . D OTHER PUBLIC ________ E (SPECIFY) PRIVATE MEDICAL SECTOR MISSION HOSP./ CLINIC . . . . F PVT. HOSPITAL/ CLINIC . . . . H PHARMACY . . . I OTHER PRIVATE MED. ________ K (SPECIFY) MOBILE CLINIC . . . L COMMUNITY HEALTH WORKER . . . . M OTHER SOURCE SHOP . . . . N TRADITIONAL PRACTITIONER O RELATIVE/FRIEND P OTHER ________ X (SPECIFY)	PUBLIC SECTOR GOVT HOSPITAL B GOVT HEALTH CENTER . . . . . C GOVT DISPENS- ARY . . . . D OTHER PUBLIC ________ E (SPECIFY) PRIVATE MEDICAL SECTOR MISSION HOSP./ CLINIC . . . . F PVT. HOSPITAL/ CLINIC . . . . H PHARMACY . . . I OTHER PRIVATE MED. ________ K (SPECIFY) MOBILE CLINIC . . . L COMMUNITY HEALTH WORKER . . . . M OTHER SOURCE SHOP . . . . N TRADITIONAL PRACTITIONER O RELATIVE/FRIEND P OTHER ________ X (SPECIFY)
524	CHECK 523:	TWO OR MORE CODES CIRCLED ☐ ONLY ONE CODE CIRCLED ☐ (SKIP TO 526)	TWO OR MORE CODES CIRCLED ☐ ONLY ONE CODE CIRCLED ☐ (SKIP TO 526)	TWO OR MORE CODES CIRCLED ☐ ONLY ONE CODE CIRCLED ☐ (SKIP TO 526)
525	Where did you first seek advice or treatment? USE LETTER CODE FROM 523.	FIRST PLACE . . . ☐	FIRST PLACE . . . ☐	FIRST PLACE . . . ☐

NO.	QUESTIONS AND FILTERS	LAST BIRTH NAME ________	NEXT-TO-LAST BIRTH NAME ________	SECOND-FROM-LAST BIRTH NAME ________
526	How many days after the diarrhoea began did you first seek advice or treatment for (NAME)? IF THE SAME DAY, RECORD '00'.	DAYS . . . . . [ ][ ]	DAYS . . . . . [ ][ ]	DAYS . . . . . [ ][ ]
527	Does (NAME) still have diarrhoea?	YES . . . . 1 NO . . . . 2 DON'T KNOW 8	YES . . . . 1 NO . . . . 2 DON'T KNOW 8	YES . . . . 1 NO . . . . 2 DON'T KNOW 8
528	Was he/she given any of the following to drink at any time since he/she started having the diarrhoea:	YES NO DK	YES NO DK	YES NO DK
	a) A fluid made from a special packet called Oralite or ORS?	FLUID FROM ORS PKT . . 1 2 8	FLUID FROM ORS PKT . . 1 2 8	FLUID FROM ORS PKT . . 1 2 8
	b) A home-made sugar-salt solution?	SUGAR-SALT SOL'N . . . 1 2 8	SUGAR-SALT SOL'N . . . 1 2 8	SUGAR-SALT SOL'N . . . 1 2 8
	c) Another home-made liquid such as porridge, soup, yoghurt, coconut water, fresh fruit juice, tea, milk, or rice water?	HOMEMADE FLUID . . . 1 2 8	HOMEMADE FLUID . . . 1 2 8	HOMEMADE FLUID . . . 1 2 8
529	Was anything (else) given to treat the diarrhea?	YES . . . . 1 NO . . . . 2 (SKIP TO 533) DON'T KNOW 8	YES . . . . 1 NO . . . . 2 (SKIP TO 533) DON'T KNOW 8	YES . . . . 1 NO . . . . 2 (SKIP TO 533) DON'T KNOW 8
530	What (else) was given to treat the diarrhoea? Anything else? RECORD ALL TREATMENTS GIVEN.	PILL OR SYRUP ANTIBIOTIC . . . . . A ANTIMOTILITY . B ZINC . . . . C OTHER (NOT ANTI-BIOTIC, ANTI-MOTILITY, OR ZINC) . . . . D UNKNOWN PILL OR SYRUP . . . E INJECTION ANTIBIOTIC . . . . . F NON-ANTIBIOTIC . G UNKNOWN INJECTION . . . H (IV) INTRAVENOUS . I HOME REMEDY/ HERBAL MED-ICINE . . . . J OTHER ________ X (SPECIFY)	PILL OR SYRUP ANTIBIOTIC . . . . . A ANTIMOTILITY . B ZINC . . . . C OTHER (NOT ANTI-BIOTIC, ANTI-MOTILITY, OR ZINC) . . . . D UNKNOWN PILL OR SYRUP . . . E INJECTION ANTIBIOTIC . . . . . F NON-ANTIBIOTIC . G UNKNOWN INJECTION . . . H (IV) INTRAVENOUS . I HOME REMEDY/ HERBAL MED-ICINE . . . . J OTHER ________ X (SPECIFY)	PILL OR SYRUP ANTIBIOTIC . . . . . A ANTIMOTILITY . B ZINC . . . . C OTHER (NOT ANTI-BIOTIC, ANTI-MOTILITY, OR ZINC) . . . . D UNKNOWN PILL OR SYRUP . . . E INJECTION ANTIBIOTIC . . . . . F NON-ANTIBIOTIC . G UNKNOWN INJECTION . . . H (IV) INTRAVENOUS . I HOME REMEDY/ HERBAL MED-ICINE . . . . J OTHER ________ X (SPECIFY)
531	CHECK 530: GIVEN ZINC?	CODE "C" CIRCLED [ ] CODE "C" NOT CIRCLED [ ] (SKIP TO 533)	CODE "C" CIRCLED [ ] CODE "C" NOT CIRCLED [ ] (SKIP TO 533)	CODE "C" CIRCLED [ ] CODE "C" NOT CIRCLED [ ] (SKIP TO 533)

NO.	QUESTIONS AND FILTERS	LAST BIRTH NAME ______________	NEXT-TO-LAST BIRTH NAME ______________	SECOND-FROM-LAST BIRTH NAME ______________
532	How many times was (NAME) given zinc?	TIMES . . . . . [ ][ ] DON'T KNOW 98	TIMES . . . . . [ ][ ] DON'T KNOW 98	TIMES . . . . . [ ][ ] DON'T KNOW 98
533	Has (NAME) been ill with a fever at any time in the last 2 weeks?	YES . . . . 1 NO . . . . 2 DON'T KNOW 8	YES . . . . 1 NO . . . . 2 DON'T KNOW 8	YES . . . . 1 NO . . . . 2 DON'T KNOW 8
534	Has (NAME) had an illness with a cough at any time in the last 2 weeks?	YES . . . . 1 NO . . . . 2 (SKIP TO 537)← DON'T KNOW 8	YES . . . . 1 NO . . . . 2 (SKIP TO 537)← DON'T KNOW 8	YES . . . . 1 NO . . . . 2 (SKIP TO 537)← DON'T KNOW 8
535	When (NAME) had an illness with a cough, did he/she breathe faster than usual with short, rapid breaths or have difficulty breathing?	YES . . . . 1 NO . . . . 2 (SKIP TO 538)← DON'T KNOW 8	YES . . . . 1 NO . . . . 2 (SKIP TO 538)← DON'T KNOW 8	YES . . . . 1 NO . . . . 2 (SKIP TO 538)← DON'T KNOW 8
536	Was the fast or difficult breathing due to a problem in the chest or to a blocked or runny nose?	CHEST ONLY . . . 1 NOSE ONLY . . . . . 2 BOTH . . . . 3 OTHER ________ 6 (SPECIFY) DON'T KNOW . . . . . 8 (SKIP TO 538)←	CHEST ONLY . . . 1 NOSE ONLY . . . . . 2 BOTH . . . . 3 OTHER ________ 6 (SPECIFY) DON'T KNOW . . . . . 8 (SKIP TO 538)←	CHEST ONLY . . . 1 NOSE ONLY . . . . . 2 BOTH . . . . 3 OTHER ________ 6 (SPECIFY) DON'T KNOW . . . . . 8 (SKIP TO 538)←
537	CHECK 533: HAD FEVER?	YES [ ] ↓ NO OR DK [ ] ↓ (GO BACK TO 503 IN NEXT COLUMN; OR, IF NO MORE BIRTHS, GO TO 573)	YES [ ] ↓ NO OR DK [ ] ↓ (GO BACK TO 503 IN NEXT COLUMN; OR, IF NO MORE BIRTHS, GO TO 573)	YES [ ] ↓ NO OR DK [ ] ↓ (GO TO 503 IN NEXT-TO-LAST COLUMN OF NEW QUESTIONNAIRE; OR, IF NO MORE BIRTHS, GO TO 573)
538	Now I would like to know how much (NAME) was given to drink (including breastmilk) during the illness with a (fever/cough). Was he/she given less than usual to drink, about the same amount, or more than usual to drink? IF LESS, PROBE: Was he/she given much less than usual to drink or somewhat less?	MUCH LESS . . . . . 1 SOMEWHAT LESS . 2 ABOUT THE SAME . 3 MORE . . . . 4 NOTHING TO DRINK 5 DON'T KNOW 8	MUCH LESS . . . . . 1 SOMEWHAT LESS . 2 ABOUT THE SAME . 3 MORE . . . . 4 NOTHING TO DRINK 5 DON'T KNOW 8	MUCH LESS . . . . . 1 SOMEWHAT LESS . 2 ABOUT THE SAME . 3 MORE . . . . 4 NOTHING TO DRINK 5 DON'T KNOW 8
539	When (NAME) had a (fever/cough), was he/she given less than usual to eat, about the same amount, more than usual, or nothing to eat? IF LESS, PROBE: Was he/she given much less than usual to eat or somewhat less?	MUCH LESS . . . . . 1 SOMEWHAT LESS . 2 ABOUT THE SAME . 3 MORE . . . . 4 STOPPED FOOD . 5 NEVER GAVE FOOD 6 DON'T KNOW 8	MUCH LESS . . . . . 1 SOMEWHAT LESS . 2 ABOUT THE SAME . 3 MORE . . . . 4 STOPPED FOOD . 5 NEVER GAVE FOOD 6 DON'T KNOW 8	MUCH LESS . . . . . 1 SOMEWHAT LESS . 2 ABOUT THE SAME . 3 MORE . . . . 4 STOPPED FOOD . 5 NEVER GAVE FOOD 6 DON'T KNOW 8
540	Did you seek advice or treatment for the illness from any source?	YES . . . . 1 NO . . . . 2 (SKIP TO 545)←	YES . . . . 1 NO . . . . 2 (SKIP TO 545)←	YES . . . . 1 NO . . . . 2 (SKIP TO 545)←

NO.	QUESTIONS AND FILTERS	LAST BIRTH NAME ______	NEXT-TO-LAST BIRTH NAME ______	SECOND-FROM-LAST BIRTH NAME ______
541	Where did you seek advice or treatment? Anywhere else? PROBE TO IDENTIFY EACH TYPE OF SOURCE AND CIRCLE THE APPROPRIATE CODE(S). IF UNABLE TO DETERMINE IF A HOSPITAL, HEALTH CENTER, OR CLINIC IS PUBLIC OR PRIVATE MEDICAL, WRITE THE THE NAME OF THE PLACE. ______ (NAME OF PLACE(S))	PUBLIC SECTOR GOVT HOSPITAL B GOVT HEALTH CENTER ..... C GOVT DISPENS-ARY .... D OTHER PUBLIC ______ E (SPECIFY) PRIVATE MEDICAL SECTOR MISSION HOSP./ CLINIC .... F PVT. HOSPITAL/ CLINIC .... H PHARMACY ... I OTHER PRIVATE MED. ______ K (SPECIFY) MOBILE CLINIC ... L COMMUNITY HEALTH WORKER .... M OTHER SOURCE SHOP .... N TRADITIONAL PRACTITIONER O RELATIVE/FRIEND P OTHER ______ X (SPECIFY)	PUBLIC SECTOR GOVT HOSPITAL B GOVT HEALTH CENTER ..... C GOVT DISPENS-ARY .... D OTHER PUBLIC ______ E (SPECIFY) PRIVATE MEDICAL SECTOR MISSION HOSP./ CLINIC .... F PVT. HOSPITAL/ CLINIC .... H PHARMACY ... I OTHER PRIVATE MED. ______ K (SPECIFY) MOBILE CLINIC ... L COMMUNITY HEALTH WORKER .... M OTHER SOURCE SHOP .... N TRADITIONAL PRACTITIONER O RELATIVE/FRIEND P OTHER ______ X (SPECIFY)	PUBLIC SECTOR GOVT HOSPITAL B GOVT HEALTH CENTER ..... C GOVT DISPENS-ARY .... D OTHER PUBLIC ______ E (SPECIFY) PRIVATE MEDICAL SECTOR MISSION HOSP./ CLINIC .... F PVT. HOSPITAL/ CLINIC .... H PHARMACY ... I OTHER PRIVATE MED. ______ K (SPECIFY) MOBILE CLINIC ... L COMMUNITY HEALTH WORKER .... M OTHER SOURCE SHOP .... N TRADITIONAL PRACTITIONER O RELATIVE/FRIEND P OTHER ______ X (SPECIFY)
542	CHECK 541:	TWO OR MORE CODES CIRCLED ☐ ONLY ONE CODE CIRCLED ☐ (SKIP TO 544)	TWO OR MORE CODES CIRCLED ☐ ONLY ONE CODE CIRCLED ☐ (SKIP TO 544)	TWO OR MORE CODES CIRCLED ☐ ONLY ONE CODE CIRCLED ☐ (SKIP TO 544)
543	Where did you first seek advice or treatment? USE LETTER CODE FROM 541.	FIRST PLACE ... ☐	FIRST PLACE ... ☐	FIRST PLACE ... ☐
544	How many days after the illness began did you first seek advice or treatment for (NAME)? IF THE SAME DAY, RECORD '00'.	DAYS ..... ☐☐	DAYS ..... ☐☐	DAYS ..... ☐☐
545	Is (NAME) still sick with a (fever/ cough)?	FEVER ONLY ..... 1 COUGH ONLY ... 2 BOTH FEVER AND COUGH .... 3 NO, NEITHER ..... 4 DON'T KNOW 8	FEVER ONLY ..... 1 COUGH ONLY ... 2 BOTH FEVER AND COUGH .... 3 NO, NEITHER ..... 4 DON'T KNOW 8	FEVER ONLY ..... 1 COUGH ONLY ... 2 BOTH FEVER AND COUGH .... 3 NO, NEITHER ..... 4 DON'T KNOW 8
546	At any time during the illness, did (NAME) take any drugs for the illness?	YES .... 1 NO .... 2 (GO BACK TO 503 IN NEXT COLUMN; OR, IF NO MORE BIRTHS, GO TO 573) DON'T KNOW 8	YES .... 1 NO .... 2 (GO BACK TO 503 IN NEXT COLUMN; OR, IF NO MORE BIRTHS, GO TO 573) DON'T KNOW 8	YES .... 1 NO .... 2 (GO TO 503 IN NEXT-TO-LAST COLUMN OF NEW QUESTIONNAIRE; OR, IF NO MORE BIRTHS, GO TO 573) DON'T KNOW 8

NO.	QUESTIONS AND FILTERS	LAST BIRTH NAME __________	NEXT-TO-LAST BIRTH NAME __________	SECOND-FROM-LAST BIRTH NAME __________
547	What drugs did (NAME) take? Any other drugs? RECORD ALL MENTIONED.	ANTIMALARIAL DRUGS SP/FANSIDAR . . . A CHLOROQUINE . B AMODIAQUINE . C QUININE . . . . D AL/COARTEM . . . E OTHER ANTI-MALARIAL ______ F (SPECIFY) ANTIBIOTIC DRUGS PILL/SYRUP . . . G INJECTION . . . H OTHER DRUGS ASPIRIN . . . . I ACETA-MINOPHEN . . . J IBUPROFEN . . . K OTHER ______ X (SPECIFY) DON'T KNOW . . . . . Z	ANTIMALARIAL DRUGS SP/FANSIDAR . . . A CHLOROQUINE . B AMODIAQUINE . C QUININE . . . . D AL/COARTEM . . . E OTHER ANTI-MALARIAL ______ F (SPECIFY) ANTIBIOTIC DRUGS PILL/SYRUP . . . G INJECTION . . . H OTHER DRUGS ASPIRIN . . . . I ACETA-MINOPHEN . . . J IBUPROFEN . . . K OTHER ______ X (SPECIFY) DON'T KNOW . . . . . Z	ANTIMALARIAL DRUGS SP/FANSIDAR . . . A CHLOROQUINE . B AMODIAQUINE . C QUININE . . . . D AL/COARTEM . . . E OTHER ANTI-MALARIAL ______ F (SPECIFY) ANTIBIOTIC DRUGS PILL/SYRUP . . . G INJECTION . . . H OTHER DRUGS ASPIRIN . . . . I ACETA-MINOPHEN . . . J IBUPROFEN . . . K OTHER ______ X (SPECIFY) DON'T KNOW . . . . . Z
548	CHECK 547: ANY CODE A-G CIRCLED?	YES ☐ ↓ NO ☐ (GO BACK TO 503 IN NEXT COLUMN; OR, IF NO MORE BIRTHS, GO TO 573)	YES ☐ ↓ NO ☐ (GO BACK TO 503 IN NEXT COLUMN; OR, IF NO MORE BIRTHS, GO TO 573)	YES ☐ ↓ NO ☐ (GO TO 503 IN NEXT-TO-LAST COLUMN OF NEW QUESTIONNAIRE; OR, IF NO MORE BIRTHS, GO TO 573)
549	Did you already have (NAME OF DRUG FROM 547) at home when the child became ill? ASK SEPARATELY FOR EACH OF THE DRUGS 'A' THROUGH 'G' THAT THE CHILD IS RECORDED AS HAVING TAKEN IN 547. IF YES FOR ANY DRUG, CIRCLE CODE FOR THAT DRUG. IF NO FOR ALL DRUGS, CIRCLE 'Y'.	ANTIMALARIAL DRUGS SP/FANSIDAR . . . A CHLOROQUINE . B AMODIAQUINE . . . C QUININE . . . . D AL/COARTEM . . . E OTHER ANTI-MALARIAL . . . F ANTIBIOTIC PILL/SYRUP . . . . G NO DRUG AT HOME . Y	ANTIMALARIAL DRUGS SP/FANSIDAR . . . A CHLOROQUINE . B AMODIAQUINE . . . C QUININE . . . . D AL/COARTEM . . . E OTHER ANTI-MALARIAL . . . F ANTIBIOTIC PILL/SYRUP . . . . G NO DRUG AT HOME . Y	ANTIMALARIAL DRUGS SP/FANSIDAR . . . A CHLOROQUINE . B AMODIAQUINE . . . C QUININE . . . . D AL/COARTEM . . . E OTHER ANTI-MALARIAL . . . F ANTIBIOTIC PILL/SYRUP . . . . G NO DRUG AT HOME . Y

NO.	QUESTIONS AND FILTERS	LAST BIRTH NAME ________	NEXT-TO-LAST BIRTH NAME ________	SECOND-FROM-LAST BIRTH NAME ________
550	CHECK 547: ANY CODE A-F CIRCLED?	YES ☐ ↓ NO ☐ (GO BACK TO 503 IN NEXT COLUMN; OR, IF NO MORE BIRTHS, GO TO 573)	YES ☐ ↓ NO ☐ (GO BACK TO 503 IN NEXT COLUMN; OR, IF NO MORE BIRTHS, GO TO 573)	YES ☐ ↓ NO ☐ (GO TO 503 IN NEXT-TO-LAST COLUMN OF NEW QUESTIONNAIRE; OR, IF NO MORE BIRTHS, GO TO 573)
551	CHECK 547: SP/FANSIDAR ('A') GIVEN	CODE 'A' CIRCLED ☐ ↓ CODE 'A' NOT CIRCLED ☐ (SKIP TO 554)	CODE 'A' CIRCLED ☐ ↓ CODE 'A' NOT CIRCLED ☐ (SKIP TO 554)	CODE 'A' CIRCLED ☐ ↓ CODE 'A' NOT CIRCLED ☐ (SKIP TO 554)
552	How long after the fever started did (NAME) first take SP/Fansidar?	SAME DAY . . . . . 0 NEXT DAY . . . . . 1 TWO DAYS AFTER FEVER . . . . . 2 THREE DAYS AFTER FEVER . . . . . 3 FOUR OR MORE DAYS AFTER FEVER . . 4 DON'T KNOW 8	SAME DAY . . . . . 0 NEXT DAY . . . . . 1 TWO DAYS AFTER FEVER . . . . . 2 THREE DAYS AFTER FEVER . . . . . 3 FOUR OR MORE DAYS AFTER FEVER . . 4 DON'T KNOW 8	SAME DAY . . . . . 0 NEXT DAY . . . . . 1 TWO DAYS AFTER FEVER . . . . . 2 THREE DAYS AFTER FEVER . . . . . 3 FOUR OR MORE DAYS AFTER FEVER . . 4 DON'T KNOW 8
553	For how many days did (NAME) take the SP/Fansidar? IF 7 DAYS OR MORE, WRITE 7.	DAYS . . . . ☐ DON'T KNOW . . . 8	DAYS . . . . ☐ DON'T KNOW . . . 8	DAYS . . . . ☐ DON'T KNOW . . . 8
554	CHECK 547: CHLOROQUINE ('B') GIVEN	CODE 'B' CIRCLED ☐ ↓ CODE 'B' NOT CIRCLED ☐ (SKIP TO 557)	CODE 'B' CIRCLED ☐ ↓ CODE 'B' NOT CIRCLED ☐ (SKIP TO 557)	CODE 'B' CIRCLED ☐ ↓ CODE 'B' NOT CIRCLED ☐ (SKIP TO 557)
555	How long after the fever started did (NAME) first take chloroquine?	SAME DAY . . . . . 0 NEXT DAY . . . . . 1 TWO DAYS AFTER FEVER . . . . . 2 THREE DAYS AFTER FEVER . . . . . 3 FOUR OR MORE DAYS AFTER FEVER . . 4 DON'T KNOW 8	SAME DAY . . . . . 0 NEXT DAY . . . . . 1 TWO DAYS AFTER FEVER . . . . . 2 THREE DAYS AFTER FEVER . . . . . 3 FOUR OR MORE DAYS AFTER FEVER . . 4 DON'T KNOW 8	SAME DAY . . . . . 0 NEXT DAY . . . . . 1 TWO DAYS AFTER FEVER . . . . . 2 THREE DAYS AFTER FEVER . . . . . 3 FOUR OR MORE DAYS AFTER FEVER . . 4 DON'T KNOW 8
556	For how many days did (NAME) take the chloroquine? IF 7 DAYS OR MORE, WRITE 7.	DAYS . . . . ☐ DON'T KNOW 8	DAYS . . . . ☐ DON'T KNOW 8	DAYS . . . . ☐ DON'T KNOW 8
557	CHECK 547: AMODIAQUINE ('C') GIVEN	CODE 'C' CIRCLED ☐ ↓ CODE 'C' NOT CIRCLED ☐ (SKIP TO 560)	CODE 'C' CIRCLED ☐ ↓ CODE 'C' NOT CIRCLED ☐ (SKIP TO 560)	CODE 'C' CIRCLED ☐ ↓ CODE 'C' NOT CIRCLED ☐ (SKIP TO 560)

NO.	QUESTIONS AND FILTERS	LAST BIRTH NAME ________	NEXT-TO-LAST BIRTH NAME ________	SECOND-FROM-LAST BIRTH NAME ________
558	How long after the fever started did (NAME) first take Amodiaquine?	SAME DAY . . . . . 0 NEXT DAY . . . . . 1 TWO DAYS AFTER FEVER . . . . . 2 THREE DAYS AFTER FEVER . . . . . 3 FOUR OR MORE DAYS AFTER FEVER . . 4 DON'T KNOW 8	SAME DAY . . . . . 0 NEXT DAY . . . . . 1 TWO DAYS AFTER FEVER . . . . . 2 THREE DAYS AFTER FEVER . . . . . 3 FOUR OR MORE DAYS AFTER FEVER . . 4 DON'T KNOW 8	SAME DAY . . . . . 0 NEXT DAY . . . . . 1 TWO DAYS AFTER FEVER . . . . . 2 THREE DAYS AFTER FEVER . . . . . 3 FOUR OR MORE DAYS AFTER FEVER . . 4 DON'T KNOW 8
559	For how many days did (NAME) take the Amodiaquine? IF 7 DAYS OR MORE, WRITE 7.	DAYS . . . . ☐ DON'T KNOW 8	DAYS . . . . ☐ DON'T KNOW 8	DAYS . . . . ☐ DON'T KNOW 8
560	CHECK 547: QUININE ('D') GIVEN	CODE 'D' CIRCLED ☐ CODE 'D' NOT CIRCLED ☐ (SKIP TO 563)	CODE 'D' CIRCLED ☐ CODE 'D' NOT CIRCLED ☐ (SKIP TO 563)	CODE 'D' CIRCLED ☐ CODE 'D' NOT CIRCLED ☐ (SKIP TO 563)
561	How long after the fever started did (NAME) first take quinine?	SAME DAY . . . . . 0 NEXT DAY . . . . . 1 TWO DAYS AFTER FEVER . . . . . 2 THREE DAYS AFTER FEVER . . . . . 3 FOUR OR MORE DAYS AFTER FEVER . . 4 DON'T KNOW 8	SAME DAY . . . . . 0 NEXT DAY . . . . . 1 TWO DAYS AFTER FEVER . . . . . 2 THREE DAYS AFTER FEVER . . . . . 3 FOUR OR MORE DAYS AFTER FEVER . . 4 DON'T KNOW 8	SAME DAY . . . . . 0 NEXT DAY . . . . . 1 TWO DAYS AFTER FEVER . . . . . 2 THREE DAYS AFTER FEVER . . . . . 3 FOUR OR MORE DAYS AFTER FEVER . . 4 DON'T KNOW 8
562	For how many days did (NAME) take the quinine? IF 7 DAYS OR MORE, WRITE 7.	DAYS . . . . ☐ DON'T KNOW . . . 8	DAYS . . . . ☐ DON'T KNOW . . . 8	DAYS . . . . ☐ DON'T KNOW . . . 8
563	CHECK 547: ARTEMETER+LUMEFANTRINE (AL/COARTEM) ('E') GIVEN	CODE 'E' CIRCLED ☐ CODE 'E' NOT CIRCLED ☐ (SKIP TO 569)	CODE 'E' CIRCLED ☐ CODE 'E' NOT CIRCLED ☐ (SKIP TO 569)	CODE 'E' CIRCLED ☐ CODE 'E' NOT CIRCLED ☐ (SKIP TO 569)
564	How long after the fever started did (NAME) first take AL?	SAME DAY . . . . . 0 NEXT DAY . . . . . 1 TWO DAYS AFTER FEVER . . . . . 2 THREE DAYS AFTER FEVER . . . . . 3 FOUR OR MORE DAYS AFTER FEVER . . 4 DON'T KNOW 8	SAME DAY . . . . . 0 NEXT DAY . . . . . 1 TWO DAYS AFTER FEVER . . . . . 2 THREE DAYS AFTER FEVER . . . . . 3 FOUR OR MORE DAYS AFTER FEVER . . 4 DON'T KNOW 8	SAME DAY . . . . . 0 NEXT DAY . . . . . 1 TWO DAYS AFTER FEVER . . . . . 2 THREE DAYS AFTER FEVER . . . . . 3 FOUR OR MORE DAYS AFTER FEVER . . 4 DON'T KNOW 8
565	For how many days did (NAME) take AL? IF 7 DAYS OR MORE, WRITE 7.	DAYS . . . . ☐ DON'T KNOW 8	DAYS . . . . ☐ DON'T KNOW 8	DAYS . . . . ☐ DON'T KNOW 8

NO.	QUESTIONS AND FILTERS	LAST BIRTH NAME ________	NEXT-TO-LAST BIRTH NAME ________	SECOND-FROM-LAST BIRTH NAME ________
569	CHECK 547: OTHER ANTIMALARIAL ('F') GIVEN	CODE 'F' CIRCLED ↓ CODE 'F' NOT CIRCLED (GO TO 571A)	CODE 'F' CIRCLED ↓ CODE 'F' NOT CIRCLED (GO TO 571A)	CODE 'F' CIRCLED ↓ CODE 'F' NOT CIRCLED (GO TO 571A)
570	How long after the fever started did (NAME) first take (OTHER ANTIMALARIAL)?	SAME DAY . . . . . 0 NEXT DAY . . . . . 1 TWO DAYS AFTER FEVER . . . . . 2 THREE DAYS AFTER FEVER . . . . . 3 FOUR OR MORE DAYS AFTER FEVER . . 4 DON'T KNOW . . . 8	SAME DAY . . . . . 0 NEXT DAY . . . . . 1 TWO DAYS AFTER FEVER . . . . . 2 THREE DAYS AFTER FEVER . . . . . 3 FOUR OR MORE DAYS AFTER FEVER . . 4 DON'T KNOW . . . 8	SAME DAY . . . . . 0 NEXT DAY . . . . . 1 TWO DAYS AFTER FEVER . . . . . 2 THREE DAYS AFTER FEVER . . . . . 3 FOUR OR MORE DAYS AFTER FEVER . . 4 DON'T KNOW . . . 8
571	For how many days did (NAME) take the (OTHER ANTIMALARIAL)? IF 7 DAYS OR MORE, WRITE 7.	DAYS . . . . [ ] DON'T KNOW . . . 8	DAYS . . . . [ ] DON'T KNOW . . . 8	DAYS . . . . [ ] DON'T KNOW . . . 8
571A	Was anything else done about (NAME)'s fever?	YES . . . . 1 NO . . . . 2 (SKIP TO 572) DON'T KNOW 8	YES . . . . 1 NO . . . . 2 (SKIP TO 572) DON'T KNOW 8	YES . . . . 1 NO . . . . 2 (SKIP TO 572) DON'T KNOW 8
571B	What was done about (NAME)'s fever?	CONSULTED TRAD'L HEALER . . . A GAVE WARM SPONGING . . . . B GAVE HERBS . . . . . C OTHER X	CONSULTED TRAD'L HEALER . . . A GAVE WARM SPONGING . . . . B GAVE HERBS . . . . . C OTHER X	CONSULTED TRAD'L HEALER . . . A GAVE WARM SPONGING . . . . B GAVE HERBS . . . . . C OTHER X
572		GO BACK TO 503 IN NEXT COLUMN; OR, IF NO MORE BIRTHS, GO TO 573.	GO BACK TO 503 IN NEXT COLUMN; OR, IF NO MORE BIRTHS, GO TO 573.	GO TO 503 IN NEXT-TO LAST COLUMN OF NEW QUESTIONNAIRE; OR, IF NO MORE BIRTHS, GO TO 573.

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
573	CHECK 215 AND 218, ALL ROWS: NUMBER OF CHILDREN **BORN IN 2003 OR LATER AND LIVING** WITH THE RESPONDENT ONE OR MORE ↓ NONE → 576 RECORD NAME OF YOUNGEST CHILD LIVING WITH HER (AND CONTINUE WITH 574) _____ (NAME)		
574	The last time (NAME FROM 573) passed stools, what was done to dispose of the stools?	CHILD USED TOILET OR LATRINE . . . 01 PUT/RINSED INTO TOILET OR LATRINE . . . . . 02 PUT/RINSED INTO DRAIN OR DITCH . . . . . 03 THROWN INTO GARBAGE . . . . . 04 BURIED . . . . . 05 LEFT IN THE OPEN . . . . . 06 OTHER _____ 96 (SPECIFY)	
575	CHECK 528(a) AND 528(b), ALL COLUMNS: NO CHILD RECEIVED FLUID FROM ORS PACKET ↓ ANY CHILD RECEIVED FLUID FROM ORS PACKET → 576B		
576	Have you ever heard of a special product called Oralite or ORS that you can get for the treatment of diarrhoea?	YES . . . . . 1 NO 2	
576A	CHECK 224: ONE OR MORE BIRTHS IN 2003 OR LATER ↓ NO BIRTHS IN 2003 OR LATER → 601		
576B	CHECK 218, ALL ROWS: **ANY** CHILD LIVING WITH RESPONDENT? YES, ONE OR MORE CHILDREN LIVING WITH HER ↓ NO CHILDREN LIVING WITH HER → 601		
576C	When a child is ill, what signs of illness would tell you that he or she should be taken to health facility or health worker? CIRCLE ALL MENTIONED.	NOT ABLE TO DRINK/BREASTFEED .. A FEVER, SHIVERING . . . . . B REPEATED VOMITING . . . . . C DIARRHOEA . . . . . D BLOOD IN STOOLS . . . . . E FAST BREATHING . . . . . F CONVULSIONS . . . . . G WEAKNESS . . . . . H GETTING SICKER . . . . . I OTHER_____ X (SPECIFY)	
577	CHECK 215 AND 218, ALL ROWS: NUMBER OF CHILDREN **BORN IN 2005 OR LATER AND LIVING** WITH THE RESPONDENT ONE OR MORE ↓ NONE → 601 RECORD NAME OF YOUNGEST CHILD LIVING WITH HER (AND CONTINUE WITH 578) _____ (NAME)		

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES				SKIP
578	Now I would like to ask you about liquids or foods (NAME FROM 577) had yesterday during the day or at night. Did (NAME FROM 577) (drink/eat):		**YES**	**NO**	**DK**	
	Plain water?	PLAIN WATER	1	2	8	
	Commercially produced infant formula?	FORMULA	1	2	8	
	Milk, such as tinned, powdered, or fresh animal milk?	MILK	1	2	8	
	Tea or coffee?	TEA OR COFFEE	1	2	8	
	Any other liquids?	OTHER LIQUIDS	1	2	8	
	Any fortified baby food like Cerelac?	BABY CEREAL	1	2	8	
	Any (other) porridge or gruel?	OTHER PORRIDGE/GRUEL. .	1	2	8	
579	Now I would like to ask you about other foods (NAME FROM 577) ate over the last 24 hours. I am interested in whether (NAME) had the item even if it was combined with other foods. Yesterday, did (NAME) eat:		**YES**	**NO**	**DK**	
	a) Any foods made from grains, like maize, rice, wheat, porridge, sorghum or other local grains?	GRAINS	1	2	8	
	b) Pumpkin, yellow yams, butternut, carrots or yellow sweet potatoes?	RED-YELLOW VEGETABLES	1	2	8	
	c) Any other food made from roots or tubers, like white potatoes, arrowroot, cassava, or other roots or tubers?	ROOTS, TUBERS	1	2	8	
	d) Any green leafy vegetables?	GREEN LEAFY VEGETABLES	1	2	8	
	e) Mango, pawpaw, guava?	MANGO, PAWPAW, GUAVA	1	2	8	
	f) Any other fruits and vegetables like bananas, apples, green beans, avocados, tomatoes, oranges, pineapples, passion fruit?	OTHER FRUITS	1	2	8	
	g) Meat, chicken, fish, liver, kidney, blood, termites, sea food or eggs?	MEAT, CHICKEN, FISH, EGGS	1	2	8	
	h) Any food made from legumes, e.g. lentils, beans, soybeans, pulses or pea nuts?	BEANS, PULSES	1	2	8	
	i) Sour milk, cheese, or yoghurt?	SOUR MILK, CHEESE	1	2	8	
	j) Any other solid or semi-solid food?	ANY OTHER SOLID OR MUSHY FOOD	1	2	8	
580	CHECK 578 (LAST 2 CATEGORIES: BABY CEREAL OR OTHER PORRIDGE/GRUEL) AND 579: AT LEAST ONE "YES' ☐ ↓ NOT A SINGLE "YES" ☐ → 601					
581	How many times did (NAME FROM 577) eat solid, semisolid, or soft foods yesterday during the day or at night? IF 7 OR MORE TIMES, RECORD '7'.	NUMBER OF TIMES . . . . . ☐ DON'T KNOW 8				

SECTION 6. MARRIAGE AND SEXUAL ACTIVITY

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
601	Are you currently married or living together with a man as if married?	YES, CURRENTLY MARRIED . . . . . 1 YES, LIVING WITH A MAN . . . . . 2 NO, NOT IN UNION 3	→ 604
602	Have you ever been married or lived together with a man as if married?	YES, FORMERLY MARRIED . . . . . 1 YES, LIVED WITH A MAN . . . . . 2 NO 3	→ 617
603	What is your marital status now: are you widowed, divorced, or separated?	WIDOWED . . . . . 1 DIVORCED . . . . . 2 SEPARATED 3	→ 609
604	Is your husband/partner living with you now or is he staying elsewhere?	LIVING WITH HER . . . . . 1 STAYING ELSEWHERE 2	
605	RECORD THE HUSBAND'S/PARTNER'S NAME AND LINE NUMBER FROM THE HOUSEHOLD QUESTIONNAIRE. IF HE IS NOT LISTED IN THE HOUSEHOLD, RECORD '00'.	NAME _____ LINE NO.	
606	Does your husband/partner have other wives or does he live with other women as if married?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	→ 609
607	Including yourself, in total, how many wives or partners does your husband live with now as if married?	TOTAL NUMBER OF WIVES AND LIVE-IN PARTNERS . . . . . DON'T KNOW 98	
608	Are you the first, second, … wife?	RANK	
609	Have you been married or lived with a man only once or more than once?	ONLY ONCE . . . . . 1 MORE THAN ONCE 2	
615	CHECK 609: MARRIED/ LIVED WITH A MAN ONLY ONCE → In what month and year did you start living with your husband/partner? MARRIED/ LIVED WITH A MAN MORE THAN ONCE → Now I would like to ask about when you started living with your first husband/partner. In what month and year was that?	MONTH . . . . . DON'T KNOW MONTH . . . . . 98 YEAR . . . . . DON'T KNOW YEAR 9998	→ 616A
616	How old were you when you first started living with him?	AGE	
616A	When you got married or lived with a man, was it your choice or it was arranged?	OWN CHOICE . . . . . 1 ARRANGED 2	
616B	When you first got married or lived with a man, was the man older than you, younger than you or the same age as you?	OLDER . . . . . 1 YOUNGER . . . . . 2 ABOUT THE SAME AGE . . . . . 3 DON'T KNOW/DON'T REMEMBER . . . 8	→ 617
616C	Would you say this person was ten or more years older than you or less than ten years older than you?	TEN OR MORE YEARS OLDER . . . . . 1 LESS THAN TEN YEARS OLDER . . . 2 OLDER, UNSURE HOW MUCH 3	
617	CHECK FOR THE PRESENCE OF OTHER PEOPLE BEFORE CONTINUING, MAKE EVERY EFFORT TO ENSURE PRIVACY.		

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
618	Now I need to ask you some questions about sexual activity in order to gain a better understanding of some important life issues. How old were you when you had sexual intercourse for the very first time?	NEVER HAD SEXUAL INTERCOURSE . . . . . 00 AGE IN YEARS . . . . . [ ][ ] FIRST TIME WHEN STARTED LIVING WITH (FIRST) HUSBAND/PARTNER 95	→ 621 → 621
619	CHECK 107: AGE 15-24 ↓ AGE 25-49	[ ]	→ 641
620	Do you intend to wait until you get married to have sexual intercourse for the first time?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW/UNSURE 8	→ 641
621	CHECK 107: AGE 15-24 ↓ AGE 25-49	[ ]	→ 626
622	The first time you had sexual intercourse, was a condom used?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW/DON'T REMEMBER . . . 8	
623	How old was the person you first had sexual intercourse with?	AGE OF PARTNER . . . . . [ ][ ] DON'T KNOW 98	→ 626
624	Was this person older than you, younger than you, or about the same age as you?	OLDER . . . . . 1 YOUNGER . . . . . 2 ABOUT THE SAME AGE . . . . . 3 DON'T KNOW/DON'T REMEMBER . . . 8	→ 626
625	Would you say this person was ten or more years older than you or less than ten years older than you?	TEN OR MORE YEARS OLDER . . . . . 1 LESS THAN TEN YEARS OLDER . . . 2 OLDER, UNSURE HOW MUCH 3	
626	When was the last time you had sexual intercourse? IF LESS THAN 12 MONTHS, ANSWER MUST BE RECORDED IN DAYS, WEEKS OR MONTHS. IF 12 MONTHS (ONE YEAR) OR MORE, ANSWER MUST BE RECORDED IN YEARS.	DAYS AGO . . . . . 1 [ ][ ] WEEKS AGO . . . . . 2 [ ][ ] MONTHS AGO . . . . . 3 [ ][ ] YEARS AGO . . . . . 4 [ ][ ]	→ 640

		LAST SEXUAL PARTNER	SECOND-TO-LAST SEXUAL PARTNER	THIRD-TO-LAST SEXUAL PARTNER
626A	Now I would like to ask you some questions about your recent sexual activity. Let me assure you again that your answers are completely confidential and will not be told to anyone. If we should come to any question that you don't want to answer, just let me know and we will go to the next question. → SKIP TO 628			
627	When was the last time you had sexual intercourse with this person?		DAYS . 1 WEEKS 2 MONTHS 3	DAYS . 1 WEEKS 2 MONTHS 3
628	The last time you had sexual intercourse (with this second/third person), was a condom used?	YES . . . . 1 NO . . . . 2 (SKIP TO 630)←	YES . . . . 1 NO . . . . 2 (SKIP TO 630)←	YES . . . . 1 NO . . . . 2 (SKIP TO 630)←
629A	What is the main reason you used a condom on that occasion?	PREVENT STD/HIV . . . . 1 AVOID PREGNANCY . . . . 2 BOTH PREVENT STD/HIV AND PREGNANCY . . . . 3 DID NOT TRUST PARTNER/ HE MAY HAVE OTHER PARTNERS . . . . 4 PARTNER WANTED TO USE 5 OTHER ______ 6 (SPECIFY)	PREVENT STD/HIV . . . . 1 AVOID PREGNANCY . . . . 2 BOTH PREVENT STD/HIV AND PREGNANCY . . . . 3 DID NOT TRUST PARTNER/ HE MAY HAVE OTHER PARTNERS . . . . 4 PARTNER WANTED TO USE 5 OTHER ______ 6 (SPECIFY)	PREVENT STD/HIV . . . . 1 AVOID PREGNANCY . . . . 2 BOTH PREVENT STD/HIV AND PREGNANCY . . . . 3 DID NOT TRUST PARTNER/ HE MAY HAVE OTHER PARTNERS . . . . 4 PARTNER WANTED TO USE 5 OTHER ______ 6 (SPECIFY)
629	Did you use a condom every time you had sexual intercourse with this person in the last 12 months?	YES . . . . 1 NO 2	YES . . . . 1 NO 2	YES . . . . 1 NO 2
630	What was your relationship to this person with whom you had sexual intercourse? IF BOYFRIEND: Were you living together as if married? IF YES, CIRCLE '2'. IF NO, CIRCLE '3'.	HUSBAND . . . . 1 (SKIP TO 636)← LIVE-IN PARTNER . . . . 2 BOYFRIEND NOT LIVING WITH RESPONDENT . . . . 3 CASUAL ACQUAINTANCE . . . 4 PAYING CLIENT 5 OTHER ______ 6 (SPECIFY)	HUSBAND . . . . 1 (SKIP TO 636)← LIVE-IN PARTNER . . . . 2 BOYFRIEND NOT LIVING WITH RESPONDENT . . . . 3 CASUAL ACQUAINTANCE . . . 4 PAYING CLIENT 5 OTHER ______ 6 (SPECIFY)	HUSBAND . . . . 1 (SKIP TO 636)← LIVE-IN PARTNER . . . . 2 BOYFRIEND NOT LIVING WITH RESPONDENT . . . . 3 CASUAL ACQUAINTANCE . . . 4 PAYING CLIENT 5 OTHER ______ 6 (SPECIFY)
631	For how long (have you had/did you have) a sexual relationship with this person? IF ONLY HAD SEXUAL RELATIONS WITH THIS PERSON ONCE, RECORD '01' DAYS.	DAYS . 1 MONTHS 2 YEARS 3	DAYS . 1 MONTHS 2 YEARS 3	DAYS . 1 MONTHS 2 YEARS 3
632	CHECK 107:	AGE 15-24 ☐↓ AGE 25-49 ☐ (SKIP TO 636)←	AGE 15-24 ☐↓ AGE 25-49 ☐ (SKIP TO 636)←	AGE 15-24 ☐↓ AGE 25-49 ☐ (SKIP TO 636)←
633	How old is this person?	AGE OF PARTNER (SKIP TO 636)← DON'T KNOW 98	AGE OF PARTNER (SKIP TO 636)← DON'T KNOW 98	AGE OF PARTNER (SKIP TO 636)← DON'T KNOW 98
634	Is this person older than you, younger than you, or about the same age?	OLDER . . . . 1 YOUNGER . . . . . 2 SAME AGE . . . . . 3 DON'T KNOW . . . 8 (SKIP TO 636) ←	OLDER . . . . 1 YOUNGER . . . . . 2 SAME AGE . . . . . 3 DON'T KNOW . . . 8 (SKIP TO 636) ←	OLDER . . . . 1 YOUNGER . . . . . 2 SAME AGE . . . . . 3 DON'T KNOW . . . 8 (SKIP TO 636) ←

		LAST SEXUAL PARTNER	SECOND-TO-LAST SEXUAL PARTNER	THIRD-TO-LAST SEXUAL PARTNER
635	Would you say this person is ten or more years older than you or less than ten years older than you?	TEN OR MORE YEARS OLDER . 1 LESS THAN TEN YEARS OLDER . 2 OLDER, UNSURE HOW MUCH . . . 3	TEN OR MORE YEARS OLDER . 1 LESS THAN TEN YEARS OLDER . 2 OLDER, UNSURE HOW MUCH . . . 3	TEN OR MORE YEARS OLDER . 1 LESS THAN TEN YEARS OLDER . 2 OLDER, UNSURE HOW MUCH . . . 3
636	The last time you had sexual intercourse with this person, did you or this person drink alcohol?	YES . . . . . 1 NO . . . . . 2 (SKIP TO 638)	YES . . . . . 1 NO . . . . . 2 (SKIP TO 638)	YES . . . . . 1 NO . . . . . 2 (SKIP TO 639)
637	Were you or your partner drunk at that time? IF YES: Who was drunk?	RESPONDENT ONLY 1 PARTNER ONLY . . . 2 BOTH RESPONDENT AND PARTNER . 3 NEITHER 4	RESPONDENT ONLY 1 PARTNER ONLY . . . 2 BOTH RESPONDENT AND PARTNER . 3 NEITHER 4	RESPONDENT ONLY 1 PARTNER ONLY . . . 2 BOTH RESPONDENT AND PARTNER . 3 NEITHER 4
638	Apart from [this person/these two people], have you had sexual intercourse with any other person in the last 12 months?	YES . . . . . 1 (GO BACK TO 627 IN NEXT COLUMN) NO . . . . . 2 (SKIP TO 640)	YES . . . . . 1 (GO BACK TO 627 IN NEXT COLUMN) NO . . . . . 2 (SKIP TO 640)	
639	In total, with how many different people have you had sexual intercourse in the last 12 months? IF NON-NUMERIC ANSWER, PROBE TO GET AN ESTIMATE. IF NUMBER OF PARTNERS IS GREATER THAN 95, WRITE '95.'			NUMBER OF PARTNERS LAST 12 MONTHS . . . [ ][ ] DON'T KNOW . . . 98

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
640	In total, with how many different people have you had sexual intercourse in your lifetime? IF NON-NUMERIC ANSWER, PROBE TO GET AN ESTIMATE. IF NUMBER OF PARTNERS IS GREATER THAN 95, WRITE '95'.	NUMBER OF PARTNERS IN LIFETIME . . . . . [ ][ ] DON'T KNOW 98	
640A	In the last 12 months, have you ever given or received money, gifts or favours in return for sex?	YES . . . . . 1 NO 2	
641	Do you know of a place where a person can get male condoms?	YES . . . . . 1 NO 2	→ 644
642	Where is that? Any other place? PROBE TO IDENTIFY EACH TYPE OF SOURCE AND CIRCLE THE APPROPRIATE CODE(S). IF UNABLE TO DETERMINE IF HOSPITAL, HEALTH CENTER OR CLINIC IS PUBLIC OR PRIVATE MEDICAL, WRITE THE NAME OF THE PLACE. _____ (NAME OF PLACE(S))	PUBLIC SECTOR GOVT. HOSPITAL . . . . . B GOVT. HEALTH CENTER . . . . . C GOVERNMENT DISPENSARY . . . D OTHER PUBLIC _____ E (SPECIFY) PRIVATE MEDICAL SECTOR FAITH-BASED, CHURCH, MISSION HOSPITAL / CLINIC . . . . . F FHOK/FPAK HEALTH CENTER/ CLINIC . . . . . G PRIVATE HOSPITAL/CLINIC . . . . . H PHARMACY/CHEMIST . . . . . I NURSING/MATERNITY HOME . . . . . J OTHER PRIV. MEDICAL _____ K (SPECIFY) OTHER SOURCE MOBILE CLINIC . . . . . L COMMUNITY-BASED DISTRIBUTOR M SHOP . . . . . N FRIEND/RELATIVE . . . . . P OTHER _____ X (SPECIFY)	
643	If you wanted to, could you yourself get a male condom?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW/UNSURE 8	
644	Do you know of a place where a person can get female condoms?	YES . . . . . 1 NO 2	→ 647

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
645	Where is that? Any other place? PROBE TO IDENTIFY EACH TYPE OF SOURCE AND CIRCLE THE APPROPRIATE CODE(S). IF UNABLE TO DETERMINE IF HOSPITAL, HEALTH CENTER OR CLINIC IS PUBLIC OR PRIVATE MEDICAL, WRITE THE NAME OF THE PLACE. _____ (NAME OF PLACE(S))	PUBLIC SECTOR GOVT. HOSPITAL . . . . . B GOVT. HEALTH CENTER . . . . . C GOVERNMENT DISPENSARY . . . D OTHER PUBLIC _____ E (SPECIFY) PRIVATE MEDICAL SECTOR FAITH-BASED, CHURCH, MISSION HOSPITAL / CLINIC . . . . . F FHOK/FPAK HEALTH CENTER/ CLINIC . . . . . G PRIVATE HOSPITAL/CLINIC . . . . . H PHARMACY/CHEMIST . . . . . I NURSING/MATERNITY HOME . . . . . J OTHER PRIV. MEDICAL _____ K (SPECIFY) OTHER SOURCE MOBILE CLINIC . . . . . L COMMUNITY-BASED DISTRIBUTOR M SHOP . . . . . N FRIEND/RELATIVE . . . . . P OTHER _____ X (SPECIFY)	
646	If you wanted to, could you yourself get a female condom?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW/UNSURE 8	
647	In the last few months have you heard or read about condoms:	**YES** **NO** RADIO . . . . . 1 2 TELEVISION . . . . . 1 2 NEWSPAPER OR MAGAZINE . . 1 2 BILLBOARDS 1 2	
	On the radio?		
	On the television?		
	In a newspaper or magazine?		
	On billboards?		
648	In your opinion,is it acceptable or unacceptable for condoms to be advertised:	**ACCEP-TABLE** **NOT ACCEP-TABLE** **DK/ UN-SURE** ON THE RADIO. . 1 2 8 ON THE TV. . . . . 1 2 8 NEWSPAPERS. . 1 2 8 BILLBOARDS. . . 1 2 8	
	On the radio?		
	On the TV?		
	In newspapers?		
	On billboards		

SECTION 7. FERTILITY PREFERENCES

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
701	CHECK 311/311A: NEITHER STERILIZED ↓ HE OR SHE STERILIZED → 713		
702	CHECK 226: NOT PREGNANT OR UNSURE ↓ Now I have some questions about the future. Would you like to have (a/another) child, or would you prefer not to have any (more) children? PREGNANT ↓ Now I have some questions about the future. After the child you are expecting now, would you like to have another child, or would you prefer not to have any more children?	HAVE (A/ANOTHER) CHILD . . . . . 1 NO MORE/NONE . . . . . 2 → 704 SAYS SHE CAN'T GET PREGNANT . 3 → 713 UNDECIDED/DON'T KNOW AND PREGNANT . . . . . 4 → 709 UNDECIDED/DON'T KNOW AND NOT PREGNANT OR UNSURE . . . . . 5 → 708	
703	CHECK 226: NOT PREGNANT OR UNSURE ↓ How long would you like to wait from now before the birth of (a/another) child? PREGNANT ↓ After the birth of the child you are expecting now, how long would you like to wait before the birth of another child?	MONTHS . . . . . 1 ☐☐ YEARS . . . . . 2 ☐☐ SOON/NOW . . . . . 993 → 708 SAYS SHE CAN'T GET PREGNANT 994 → 713 AFTER MARRIAGE . . . . . 995 OTHER _____ 996 → 708 (SPECIFY) DON'T KNOW 998	
704	CHECK 226: NOT PREGNANT OR UNSURE ↓ PREGNANT → 709		
705	CHECK 310: USING A CONTRACEPTIVE METHOD? NOT ASKED ↓ NOT CURRENTLY USING ↓ CURRENTLY USING → 713		
706	CHECK 703: NOT ASKED ↓ 24 OR MORE MONTHS OR 02 OR MORE YEARS ↓ 00-23 MONTHS OR 00-01 YEAR → 709		

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
707	CHECK 702: WANTS TO HAVE A/ANOTHER CHILD → You have said that you do not want (a/another) child soon, but you are not using any method to avoid pregnancy. Can you tell me why you are not using a method? Any other reason? WANTS NO MORE/ NONE → You have said that you do not want any (more) children, but you are not using any method to avoid pregnancy. Can you tell me why you are not using a method? Any other reason? RECORD ALL REASONS MENTIONED.	NOT MARRIED . . . . . A FERTILITY-RELATED REASONS NOT HAVING SEX . . . . . B INFREQUENT SEX . . . . . C MENOPAUSAL/HYSTERECTOMY . D SUBFECUND/INFECUND . . . . . E POSTPARTUM AMENORRHEIC . . . F BREASTFEEDING . . . . . G FATALISTIC . . . . . H OPPOSITION TO USE RESPONDENT OPPOSED . . . . . I HUSBAND/PARTNER OPPOSED . J OTHERS OPPOSED . . . . . K RELIGIOUS PROHIBITION . . . . . L LACK OF KNOWLEDGE KNOWS NO METHOD . . . . . M KNOWS NO SOURCE . . . . . N METHOD-RELATED REASONS HEALTH CONCERNS . . . . . O FEAR OF SIDE EFFECTS . . . . . P LACK OF ACCESS/TOO FAR . . . . . Q COSTS TOO MUCH . . . . . R INCONVENIENT TO USE . . . . . S INTERFERES WITH BODY'S NORMAL PROCESSES . . . . . T OTHER _____ (SPECIFY) X DON'T KNOW . . . . . Z	
707A	In the next few weeks, if you dicovered that you were pregnant, would that be a big problem, a small problem, or no problem for you?	BIG PROBLEM . . . . . 1 SMALL PROBLEM . . . . . 2 NO PROBLEM . . . . . 3 SAYS SHE CAN'T GET PREGNANT/ NOT HAVING SEX 4	
708	CHECK 310: USING A CONTRACEPTIVE METHOD? NOT ASKED → NO, NOT CURRENTLY USING → YES, CURRENTLY USING → 713		
709	Do you think you will use a contraceptive method to delay or avoid pregnancy at any time in the future?	YES . . . . . 1 NO . . . . . 2 → 711 DON'T KNOW . . . . . 8 → 713	
710	Which contraceptive method would you prefer to use?	FEMALE STERILIZATION . . . . . 01 MALE STERILIZATION . . . . . 02 PILL . . . . . 03 IUD . . . . . 04 INJECTABLES . . . . . 05 IMPLANTS . . . . . 06 CONDOM . . . . . 07 FEMALE CONDOM . . . . . 08 LACTATIONAL AMEN. METHOD . . . . . 09 RHYTHM METHOD . . . . . 10 WITHDRAWAL . . . . . 11 OTHER _____ (SPECIFY) 96 UNSURE 98	→ 713

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
711	What is the main reason that you think you will not use a contraceptive method at any time in the future?	NOT MARRIED . . . . . 11 FERTILITY-RELATED REASONS INFREQUENT SEX/NO SEX . . . . . 22 MENOPAUSAL/HYSTERECTOMY 23 SUBFECUND/INFECUND . . . . . 24 WANTS AS MANY CHILDREN AS POSSIBLE . . . . . 26 OPPOSITION TO USE RESPONDENT OPPOSED . . . . . 31 HUSBAND/PARTNER OPPOSED 32 OTHERS OPPOSED . . . . . 33 RELIGIOUS PROHIBITION . . . . . 34 LACK OF KNOWLEDGE KNOWS NO METHOD . . . . . 41 KNOWS NO SOURCE . . . . . 42 METHOD-RELATED REASONS HEALTH CONCERNS . . . . . 51 FEAR OF SIDE EFFECTS . . . . . 52 LACK OF ACCESS/TOO FAR . . . . . 53 COSTS TOO MUCH . . . . . 54 INCONVENIENT TO USE . . . . . 55 INTERFERES WITH BODY'S NORMAL PROCESSES . . . . . 56 OTHER _____ 96 (SPECIFY) DON'T KNOW 98	→ 713
712	Would you ever use a contraceptive method if you were married?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	
713	CHECK 216: HAS LIVING CHILDREN ↓ If you could go back to the time you did not have any children and could choose exactly the number of children to have in your whole life, how many would that be? NO LIVING CHILDREN ↓ If you could choose exactly the number of children to have in your whole life, how many would that be? PROBE FOR A NUMERIC RESPONSE.	NONE . . . . . 00 → 715 NUMBER . . . . . ☐☐ OTHER _____ 96 → 715 (SPECIFY)	
714	How many of these children would you like to be boys, how many would you like to be girls and for how many would the sex not matter?	BOYS GIRLS EITHER NUMBER ☐☐ ☐☐ ☐☐ OTHER _____ 96 (SPECIFY)	
715	In the last few months have you: Heard about family planning on the radio? Seen about family planning on the television? Read about family planning in a newspaper or magazine?	YES NO RADIO . . . . . 1 2 TELEVISION . . . . . 1 2 NEWSPAPER OR MAGAZINE . . . 1 2	

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
717	CHECK 601: YES, CURRENTLY MARRIED ↓ YES, LIVING WITH A MAN ↓ NO, NOT IN UNION → 801		
718	CHECK 311/311A: CODE B, G, OR M CIRCLED → 720 NO CODE CIRCLED → 722 OTHER ↓		
719	Does your husband/partner know that you are using a method of family planning?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	
720	Would you say that using contraception is mainly your decision, mainly your husband's/partner's decision, or did you both decide together?	MAINLY RESPONDENT . . . . . 1 MAINLY HUSBAND/PARTNER . . . . . 2 JOINT DECISION . . . . . 3 OTHER _____ 6 (SPECIFY)	
720A	Now I want to ask you about your husband's/partner's views on family planning. Do you think that your husband/partner approves or disapproves of couples using a method to avoid pregnancy?	APPROVES . . . . . 1 DISAPPROVES . . . . . 2 DOES NOT KNOW 8	
720B	How often have you talked to your husband/partner about family planning in the past year?	NEVER . . . . . 1 ONCE OR TWICE . . . . . 2 MORE OFTEN 3	
721	CHECK 311/311A: NEITHER STERILIZED ↓ HE OR SHE STERILIZED → 801		
722	Does your husband/partner want the same number of children that you want, or does he want more or fewer than you want?	SAME NUMBER . . . . . 1 MORE CHILDREN . . . . . 2 FEWER CHILDREN . . . . . 3 DON'T KNOW 8	

SECTION 8. HUSBAND'S BACKGROUND AND WOMAN'S WORK

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
801	CHECK 601 AND 602: CURRENTLY MARRIED/ LIVING WITH A MAN ↓ FORMERLY MARRIED/ LIVED WITH A MAN → 803 NEVER MARRIED AND NEVER LIVED WITH A MAN → 807		
802	How old was your husband/partner on his last birthday?	AGE IN COMPLETED YEARS ☐☐	
803	Did your (last) husband/partner ever attend school?	YES . . . . . 1 NO . . . . . 2 → 806	
804	What is the highest level of school he attended: primary, vocational, secondary, or higher?	PRIMARY . . . . . 1 POST-PRIMARY/VOCATIONAL . . . . . 2 SECONDARY/'A' LEVEL . . . . . 3 COLLEGE (MIDDLE LEVEL) . . . . . 4 UNIVERSITY . . . . . 5 DON'T KNOW . . . . . 8 → 806	
805	What is the highest (standard/form/year) he completed at that level? IF NONE, WRITE '00'.	STANDARD/FORM/YEAR . . . ☐☐ DON'T KNOW 98	
806	CHECK 801: CURRENTLY MARRIED/ LIVING WITH A MAN ↓ What is your husband's/partner's occupation? That is, what kind of work does he mainly do? FORMERLY MARRIED/ LIVED WITH A MAN ↓ What was your (last) husband's/ partner's occupation? That is, what kind of work did he mainly do?	_____ ☐☐ _____ _____	
807	Aside from your own housework, have you done any work in the last seven days?	YES . . . . . 1 NO . . . . . 2 → 811	
808	As you know, some women take up jobs for which they are paid in cash or kind. Others sell things, have a small business or work on the family farm or in the family business. In the last seven days, have you done any of these things or any other work?	YES . . . . . 1 NO . . . . . 2 → 811	
809	Although you did not work in the last seven days, do you have any job or business from which you were absent for leave, illness, vacation, maternity leave or any other such reason?	YES . . . . . 1 NO . . . . . 2 → 811	
810	Have you done any work in the last 12 months?	YES . . . . . 1 NO . . . . . 2 → 818	
811	What is your occupation, that is, what kind of work do you mainly do?	_____ ☐☐ _____ _____	
812	CHECK 811: WORKS IN AGRICULTURE ↓ DOES NOT WORK IN AGRICULTURE → 814		

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
813	Do you work mainly on your own land or on family land, or do you work on land that you rent from someone else, or do you work on someone else's land?	OWN LAND . . . . . 1 FAMILY LAND . . . . . 2 RENTED LAND . . . . . 3 SOMEONE ELSE'S LAND . . . . . 4 OTHER _____ 6 (SPECIFY)	
814	Do you do this work for a member of your family, for someone else, or are you self-employed?	FOR FAMILY MEMBER . . . . . 1 FOR SOMEONE ELSE . . . . . 2 SELF-EMPLOYED 3	
815	Do you usually work at home or away from home?	HOME . . . . . 1 AWAY 2	
816	Do you usually work throughout the year, or do you work seasonally, or only once in a while?	THROUGHOUT THE YEAR . . . . . 1 SEASONALLY/PART OF THE YEAR . 2 ONCE IN A WHILE 3	
817	Are you paid in cash or kind for this work or are you not paid at all?	CASH ONLY . . . . . 1 CASH AND KIND . . . . . 2 IN KIND ONLY . . . . . 3 NOT PAID 4	
818	CHECK 601: CURRENTLY MARRIED/LIVING WITH A MAN ☐ NOT IN UNION ☐		→ 827
819	CHECK 817: CODE 1 OR 2 CIRCLED ☐ OTHER ☐		→ 822
820	Who usually decides how the money you earn will be used: mainly you, mainly your husband/partner, or you and your husband/partner jointly?	RESPONDENT . . . . . 1 HUSBAND/PARTNER . . . . . 2 RESPONDENT AND HUSBAND/PARTNER JOINTLY . . . 3 OTHER _____ 6 (SPECIFY)	
821	Would you say that the money that you earn is more than what your husband/partner earns, less than what he earns, or about the same?	MORE THAN HIM . . . . . 1 LESS THAN HIM . . . . . 2 ABOUT THE SAME . . . . . 3 HUSBAND/PARTNER DOESN'T BRING IN ANY MONEY . . . . . 4 DON'T KNOW 8	→ 823
822	Who usually decides how your husband's/partner's earnings will be used: you, your husband/partner, or you and your husband/partner jointly?	RESPONDENT . . . . . 1 HUSBAND/PARTNER . . . . . 2 RESPONDENT AND HUSBAND/PARTNER JOINTLY . . . 3 HUSBAND/PARTNER HAS NO EARNINGS . . . . . 4 OTHER _____ 6 (SPECIFY)	
823	Who usually makes decisions about health care for yourself: you, your husband/partner, you and your husband/partner jointly, or someone else?	RESPONDENT = 1 HUSBAND/PARTNER = 2 RESPONDENT & HUSBAND/PARTNER JOINTLY = 3 SOMEONE ELSE = 4 OTHER = 6 1 2 3 4 6	
824	Who usually makes decisions about making major household purchases?	1 2 3 4 6	

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
825	Who usually makes decisions about making purchases for daily household needs?	1 2 3 4 6	
826	Who usually makes decisions about visits to your family or relatives?	1 2 3 4 6	
826A	Who usually makes decisions about what food should be cooked each day?	1 2 3 4 6	
827	PRESENCE OF OTHERS AT THIS POINT (PRESENT AND LISTENING, PRESENT BUT NOT LISTENING, OR NOT PRESENT)	PRES./ LISTEN. / PRES./ NOT LISTEN. / NOT PRES. CHILDREN < 10 . . . . . 1 2 3 HUSBAND . . . . . 1 2 3 OTHER MALES . . . . . 1 2 3 OTHER FEMALES . . . 1 2 3	
828	Sometimes a husband is annoyed or angered by things that his wife does. In your opinion, is a husband justified in hitting or beating his wife in the following situations:	YES / NO / DK	
	If she goes out without telling him?	GOES OUT 1 2 8	
	If she neglects the children?	NEGL. CHILDREN . . . 1 2 8	
	If she argues with him?	ARGUES 1 2 8	
	If she refuses to have sex with him?	REFUSES SEX 1 2 8	
	If she burns the food?	BURNS FOOD 1 2 8	

SECTION 9. HIV/AIDS

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
901	Now I would like to talk about something else. Have you ever heard of an illness called AIDS?	YES . . . . . 1 NO 2	→ 917
902	Can people reduce their chance of getting the AIDS virus by having just one uninfected sex partner who has no other sex partners?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	
903	Can people get the AIDS virus from mosquito bites?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	
904	Can people reduce their chance of getting the AIDS virus by using a condom every time they have sex?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	
905	Can people get the AIDS virus by sharing food with a person who has AIDS?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	
906	Can people reduce their chance of getting the AIDS virus by not having sexual intercourse at all?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	
907	Can people get the AIDS virus because of witchcraft or other supernatural means?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	
908A	Is there anything else a person can do to avoid getting AIDS or the virus?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	→ 909 → 909
908B	What can a person do? Anything else? CIRCLE ALL MENTIONED	ABSTAIN FROM SEX . . . . . A USE CONDOMS . . . . . B LIMIT SEX TO ONE PARTNER/STAY FAITHFUL TO ONE PARTNER . . . . . C LIMIT NUMBER OF SEX PARTNER . . . D AVOID SEX WITH PROSTITUTES . . . . . E AVOID SEX WITH PERSONS WHO HAVE MANY PARTNERS . . . . . F AVOID SEX WITH HOMOSEXUALS . . . G AVOID SEX WITH DRUG USERS . . . . . H AVOID BLOOD TRANSFUSIONS . . . . . I AVOID INJECTIONS . . . . . J AVOID SHARING RAZORS/BLADES . . . K AVOID KISSING . . . . . L AVOID MOSQUITO BITES . . . . . M SEEK PROTECTION FROM TRADITIONAL HEALER . . . . . N OTHERS (SPECIFY)_____ W OTHERS (SPECIFY)_____ X DON'T KNOW Z	
909	Is it possible for a healthy-looking person to have the AIDS virus?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	
910	Do you know someone personally who has the virus that causes AIDS or someone who died of AIDS?	YES . . . . . 1 NO 2	
911	Can the virus that causes AIDS be transmitted from a mother to her baby: During pregnancy? During delivery? By breastfeeding?	YES NO DK DURING PREG. . . . . 1 2 8 DURING DELIVERY . . . 1 2 8 BREASTFEEDING . . . 1 2 8	

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
912	CHECK 911: AT LEAST ONE 'YES' ☐ OTHER ☐ → 913		
912A	Are there any special drugs that a doctor or a nurse can give to a woman infected with the AIDS virus to reduce the risk of transmission to the baby?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	
913	CHECK 801: CURRENTLY MARRIED/ LIVING WITH A MAN ☐ FORMERLY MARRIED/ LIVED WITH A MAN ☐ NEVER MARRIED/ NEVER LIVED WITH A MAN ☐ → 914A		
914	Have you ever talked with (your husband/the man you are with) about ways to prevent getting the virus that causes AIDS?	YES . . . . . 1 NO 2	
914A	Would you buy fresh vegetables from a shopkeeper or vendor if you knew that this person had the AIDS virus?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	
915	If a member of your family got infected with the AIDS virus, would you want it to remain a secret or not?	YES, REMAIN A SECRET . . . . . 1 NO . . . . . 2 DK/NOT SURE/DEPENDS 8	
916	If a member of your family became sick with AIDS, would you be willing to care for her or him in your own household?	YES . . . . . 1 NO . . . . . 2 DK/NOT SURE/DEPENDS 8	
916A	In your opinion, if a female teacher has the AIDS virus, but is not sick, should she be allowed to continue teaching in the school?	SHOULD BE ALLOWED . . . . . 1 SHOULD NOT BE ALLOWED . . . . . 2 DK/NOT SURE/DEPENDS 8	
916B	Should children age 12-14 years be taught about using condoms to avoid getting AIDS?	YES . . . . . 1 NO . . . . . 2 DK/NOT SURE/DEPENDS 8	
916B1	Do you think your chances of getting AIDS are small, moderate, great or no risk at all?	NO RISK AT ALL . . . . . 1 SMALL . . . . . 2 MODERATE . . . . . 3 → 916B3 GREAT . . . . . 4 HAS AIDS . . . . . 5 → 916B4	
916B2	Why do you think that you have (no risk/small chance) of getting AIDS? Any reasons? CIRCLE ALL MENTIONED	IS NOT HAVING SEX . . . . . A USES CONDOM . . . . . B HAS ONLY ONE PARTNER . . . . . C LIMITS THE NUMBER OF PARTNERS .. D PATNER HAS NO OTHER PATNERS .. E OTHER_____ X (SPECIFY)	→ 916B4
916B3	Why do you think that you have (moderate/great) chance of getting AIDS? Any reasons? CIRCLE ALL MENTIONED	DOES NOT USE CONDOM . . . . . A HAS MORE THAN ONE SEX PARTNER .. B PARTNER HAS OTHER PARTNERS . . . C HOMOSEXUAL CONTACTS . . . . . D HAD BLOOD TRANSFUSION/INJECTION E OTHER_____ X (SPECIFY)	
916B4	Have you ever heard of VCT?	YES . . . . . 1 NO 2	
916B5	CHECK 208 AND 215: NO BIRTHS ☐ → 916C LAST BIRTH SINCE JANUARY 2005 ☐ LAST BIRTH BEFORE JANUARY 2005 ☐ → 916C		

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
916B6	CHECK 407 FOR LAST BIRTH: HAD ANTENATAL CARE ☐↓ NO ANTENATAL CARE ☐		→916C
916B7	CHECK FOR PRESENCE OF OTHERS. BEFORE CONTINUING, MAKE EVERY EFFORT TO ENSURE PRIVACY.		
916B8	During any of the antenatal visits for your last birth, did anyone talk to you about: Babies getting the AIDS virus from their mother? Things that you can do to prevent getting the AIDS virus? Getting tested for the AIDS virus?	YES NO DK AIDS FROM MOTHER 1 2 8 THINGS TO DO . . . 1 2 8 TESTED FOR AIDS .. 1 2 8	
916B9	Were you offered a test for the AIDS virus as part of your antenatal care?	YES . . . . . 1 NO 2	
916B10	I don't want to know the results, but were you tested for the AIDS virus as part of your antenatal care?	YES . . . . . 1 NO 2	→ 916C
916B11	I don't want to know the results, but did you get the results of the test?	YES . . . . . 1 NO 2	
916B12	Where was the test done? IF SOURCE IS HOSPITAL, HEALTH CENTRE OR CLINIC, WRITE THE NAME OF THE PLACE. PROBE TO IDENTIFY THE TYPE SOURCE AND CIRCLE THE APPROPRIATE CODE. NAME OF PLACE _____ IF NURSING/MATERNITY HOME, ASK IF IT IS RUN BY A CHURCH OR MISSION. IF SO, CIRCLE CODE "21".	PUBLIC SECTOR GOVERNMENT HOSPITAL . . . . . 11 GOVT. HEALTH CENTRE/CLINIC . . . 12 GOVERNMENT DISPENSARY . . . . . 13 OTHER PUBLIC _____ 16 (SPECIFY) PRIVATE MEDICAL SECTOR MISSIONARY/CHURCH HOSP./CLINIC 21 FPAK HEALTH CENTRE/CLINIC . . . 22 PRIVATE HOSPITAL/CLINIC . . . . . 23 VCT CENTRE . . . . . 24 NURSING/MATERNITY HOMES . . . 25 BLOOD TRANSFUSION SERVICES 26 OTHER PRIVATE MEDICAL _____ 27 (SPECIFY) OTHER _____ 96 (SPECIFY)	
916B13	Have you been tested for the AIDS virus since that time you were tested during your pregnancy?	YES . . . . . 1 NO 2	→ 916C1
916B14	When was the last time you were tested for the AIDS virus?	LESS THAN 12 MONTHS AGO . . . . . 1 12 - 23 MONTHS AGO . . . . . 2 2 OR MORE YEARS AGO 3	→ 917
916C	I do not want to know the results, but have you ever been tested to see if you have the AIDS virus?	YES . . . . . 1 NO 2	→ 916D
916C1	When was the last time you were tested?	LESS THAN 12 MONTHS AGO . . . . . 1 12 - 23 MONTHS AGO . . . . . 2 2 OR MORE YEARS AGO 3	
916C2	The last time you were tested, did you ask for the test, was it offered to you and you accepted, or was ir required?	ASKED FOR TEST . . . . . 1 OFFERED AND ACCEPTED . . . . . 2 REQUIRED 3	
916C3	I donot want to know the results, but did you get the results of the test?	YES . . . . . 1 NO 2	

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
916C4	Where was the test done? IF SOURCE IS HOSPITAL, HEALTH CENTRE OR CLINIC, WRITE THE NAME OF THE PLACE. PROBE TO IDENTIFY THE TYPE SOURCE AND CIRCLE THE APPROPRIATE CODE. NAME OF PLACE_____ IF NURSING/MATERNITY HOME, ASK IF IT IS RUN BY A CHURCH OR MISSION. IF SO, CIRCLE CODE "21".	PUBLIC SECTOR GOVERNMENT HOSPITAL . . . . . 11 GOVT. HEALTH CENTRE/CLINIC . . . 12 GOVERNMENT DISPENSARY . . . . . 13 OTHER PUBLIC_____ 16 (SPECIFY) PRIVATE MEDICAL SECTOR MISSIONARY/CHURCH HOSP./CLINIC 21 FPAK HEALTH CENTRE/CLINIC . . . 22 PRIVATE HOSPITAL/CLINIC . . . . . 23 VCT CENTRE . . . . . 24 NURSING/MATERNITY HOMES . . . 25 BLOOD TRANSFUSION SERVICES 26 OTHER PRIVATE MEDICAL_____ 27 (SPECIFY) OTHER _____ 96 (SPECIFY)	→ 917
916D	Would you want to be tested for the AIDS virus?	YES . . . . . 1 NO . . . . . 2 DK/NOT SURE 8	
916E	Do you know of a place where people can go to get tested for the AIDS virus?	YES . . . . . 1 NO 2	→ 917
916F	Where is that? Any other place? IF SOURCE IS HOSPITAL, HEALTH CENTRE OR CLINIC, WRITE THE NAME OF THE PLACE. PROBE TO IDENTIFY THE TYPE SOURCE AND CIRCLE THE APPROPRIATE CODE(S). NAME OF PLACE_____ IF NURSING/MATERNITY HOME, ASK IF IT IS RUN BY A CHURCH OR MISSION. IF SO, CIRCLE CODE "E".	PUBLIC SECTOR GOVERNMENT HOSPITAL . . . . . A GOVT. HEALTH CENTRE/CLINIC . . . B GOVERNMENT DISPENSARY . . . . . C OTHER PUBLIC_____ D (SPECIFY) PRIVATE MEDICAL SECTOR MISSIONARY/CHURCH HOSP./CLINIC E FPAK HEALTH CENTRE/CLINIC . . . F PRIVATE HOSPITAL/CLINIC . . . . . G VCT CENTRE . . . . . H NURSING/MATERNITY HOMES . . . I BLOOD TRANSFUSION SERVICES J OTHER PRIVATE MEDICAL_____ K (SPECIFY) OTHER _____ X (SPECIFY)	
917	CHECK 901: HEARD ABOUT AIDS Apart from AIDS, have you heard about other infections that can be transmitted through sexual contact? NOT HEARD ABOUT AIDS Have you heard about infections that can be transmitted through sexual contact?	YES . . . . . 1 NO 2	→ 919A

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
918	If a man has a sexually transmitted disease, what symptoms might he have? Any others? RECORD ALL MENTIONED	ABDOMINAL PAIN . . . . . A GENITAL DISCHARGE/DRIPPING . . . . . B FOUL SMELL/DISCHARGE . . . . . C BURNING PAIN ON URINATION . . . . . D REDNESS/INFLAMATION IN GENITAL AREA . . . . . E SWELLING IN GENITAL AREA . . . . . F GENITAL SORES/ULCERS . . . . . G GENITAL WARTS . . . . . H GENITAL ITCHING . . . . . I BLOOD IN URINE . . . . . J LOSS OF WEIGHT . . . . . K IMPOTENCE/NO ERECTION . . . . . L OTHER _____ W (SPECIFY) OTHER _____ X (SPECIFY) NO SYMPTOMS . . . . . Y DOES NOT KNOW . . . . . Z	
919	If a woman has a sexually transmitted disease, what symptoms might she have? Any others? RECORD ALL MENTIONED	ABDOMINAL PAIN . . . . . A GENITAL DISCHARGE . . . . . B FOUL SMELL/DISCHARGE . . . . . C BURNING PAIN ON URINATION . . . . . D REDNESS/INFLAMATION IN GENITAL AREA . . . . . E SWELLING IN GENITAL AREA . . . . . F GENITAL SORES/ULCERS . . . . . G GENITAL WARTS . . . . . H GENITAL ITCHING . . . . . I BLOOD IN URINE . . . . . J LOSS OF WEIGHT . . . . . K HARD TO GET PREGNANT . . . . . L OTHER _____ W (SPECIFY) OTHER _____ X (SPECIFY) NO SYMPTOMS . . . . . Y DOES NOT KNOW . . . . . Z	
919A	CHECK 618: HAS HAD SEXUAL INTERCOURSE ↓ HAS NOT HAD SEXUAL INTERCOURSE →		1001
919A1	CHECK917: HEARD ABOUT OTHER SEXUALLY TRANSMITTED INFECTIONS? YES ↓ NO →		919C
919B	Now I would like to ask you some questions about your health in the last twelve months. During the last twelve months have you had a sexually transmitted disease?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	
919C	Sometimes women experience an abnormal vaginal discharge. During the last twelve months, have you had a bad smelling unusual discharge from your vagina?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	
919D	Sometimes women have a genital sore or ulcer. During the last twelve months have you had a genital sore or ulcer?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	
919E	CHECK 919B, 919C AND 919D HAS HAD AN INFECTION (ANY 'YES') ↓ HAS NOT HAD AN INFECTION OR DOES NOT KNOW →		1001
919F	Last time you had (PROBLEM(S) FROM 919B/919C/919D), did you seek any kind of advice or treatment?	YES . . . . . 1 NO 2	→ 919H

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
919G	Where did you go? Any other place? PROBE TO IDENTIFY EACH TYPE OF SOURCE AND CIRCLE THE APPROPRIATE CODE(S). IF UNABLE TO DETERMINE IF HOSPITAL, HEALTH CENTER VCT CENTER, OR CLINIC IS PUBLIC OR PRIVATE MEDICAL, WRITE THE NAME OF THE PLACE. _____ (NAME OF PLACE(S))	PUBLIC SECTOR GOVERNMENT HOSPITAL . . . . . A GOVT. HEALTH CENTRE/CLINIC . . . B GOVERNMENT DISPENSARY . . . . . C OTHER PUBLIC _____ D (SPECIFY) PRIVATE MEDICAL SECTOR MISSIONARY/CHURCH HOSP./CLINIC E FPAK HEALTH CENTRE/CLINIC . . . F PRIVATE HOSPITAL/CLINIC . . . . . G VCT CENTRE . . . . . H NURSING/MATERNITY HOMES . . . I BLOOD TRANSFUSION SERVICES J OTHER PRIVATE MEDICAL _____ K (SPECIFY) OTHER SOURCE TRADITIONAL HEALER . . . . . L SHOP/PHARMACY . . . . . M FRIENDS OR RELATIVES . . . . . N OTHER _____ X (SPECIFY)	
919H	When you had (PROBLEM(S) FROM 919B/919C/919D), did you inform the person(s) with whom you were having sex?	YES, INFORMED ALL PARTNERS . . . 1 NO, INFORMED NONE . . . . . 2 INFORMED SOME NOT ALL . . . . . 3 DID NOT HAVE A PARTNER 4	→ 1001
919I	When you had (PROBLEM(S) FROM 919B/919C/919D), did you do anything to avoid infecting your sexual partners(s)	YES . . . . . 1 NO . . . . . 2 DID NOT HAVE A PARTNER 3	→ 1001 → 1001
919J	What did you do to avoid infecting your partner(s)? Did you: Use medicine? Stop having sex? Use a condom when having sex?	YES NO USE MEDICINE . . . . . 1 2 STOP SEX . . . . . 1 2 USE CONDOM 1 2	

SECTION 10. OTHER HEALTH ISSUES

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
1001	Have you ever heard of an illness called tuberculosis or TB?	YES . . . . . 1 NO 2	→ 1009
1002	How does tuberculosis spread from one person to another? PROBE: Any other ways? RECORD ALL MENTIONED.	THROUGH THE AIR WHEN COUGHING OR SNEEZING . . . . . A THROUGH SHARING UTENSILS . . . . . B THROUGH TOUCHING A PERSON WITH TB . . . . . C THROUGH FOOD . . . . . D THROUGH SEXUAL CONTACT . . . . . E THROUGH MOSQUITO BITES . . . . . F OTHER _____ X (SPECIFY) DON'T KNOW . . . . . Z	
1003	Can tuberculosis be cured?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	
1004	If a member of your family got tuberculosis, would you want it to remain a secret or not?	YES, REMAIN A SECRET . . . . . 1 NO . . . . . 2 DON'T KNOW/NOT SURE/ DEPENDS 8	
1009	Do you currently smoke cigarettes?	YES . . . . . 1 NO 2	→ 1011
1010	In the last 24 hours, how many cigarettes did you smoke?	CIGARETTES	
1011	Do you currently smoke or use any other type of tobacco?	YES . . . . . 1 NO 2	→ 1014
1012	What (other) type of tobacco do you currently smoke or use? RECORD ALL MENTIONED.	PIPE . . . . . A CHEWING TOBACCO . . . . . B SNUFF . . . . . C OTHER _____ X (SPECIFY)	
1014	Are you covered by any health insurance?	YES . . . . . 1 NO 2	→ 1016
1015	What type of health insurance? RECORD ALL MENTIONED.	MUTUAL HEALTH ORGANIZATION/ COMMUNITY-BASED HEALTH INSURANCE . . . . . A HEALTH INSURANCE THROUGH EMPLOYER . . . . . B SOCIAL SECURITY . . . . . C OTHER PRIVATELY PURCHASED COMMERCIAL HEALTH INSURANCE. D OTHER _____ X (SPECIFY)	

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
1016	Sometimes a woman can have a problem such that she experiences a constant leakage of urine or stool from her vagina during the day and night. This problem usually occurs after a difficult childbirth, but may also occur after a sexual assault or after a pelvic surgery. Have you ever experienced a constant leakage of urine or stool from your vagina during the day and night?	YES . . . . . 1 NO 2	→ 1101
1017	Did this problem occur after a **delivery**?	YES . . . . . 1 NO 2	→ 1021
1018	Did this problem occur after a **sexual assault**?	YES . . . . . 1 NO 2	→ 1023
1019	Did this problem occur after you had **pelvic surgery**?	YES . . . . . 1 NO 2	→ 1023
1020	Did this problem occur after some other event happened to you? IF YES: What happened?	YES . . . . . 1 NO . . . . . 2 EVENT _____ (SPECIFY)	→ 1023 → 1024
1021	Did this problem occur after an uncomplicated delivery, after a difficult delivery where the child was born alive, or after a difficult delivery where the child was born still?	UNCOMP. DELIVERY . . . . . 1 DIFF DELIVERY, LIVEBORN . . . . . 2 DIFF DELIVERY, STILLBORN 3	
1022	After which delivery did this occur?	DELIVERY NUMBER: ☐☐	
1023	How many days after did the leakage start? IF MORE THAN 99 DAYS, WRITE '99'.	NUMBER OF DAYS AFTER PRECIPITATING EVENT . . . . . ☐☐	
1024	Have you sought treatment for this condition?	YES . . . . . 1 NO 2	

SECTION 11. MATERNAL MORTALITY

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
1101	Now I would like to ask you some questions about your brothers and sisters, that is, all of the children born to your biological mother, including those who are living with you, those living elsewhere and those who have died. How many children did your mother give birth to, including you?	NUMBER OF BIRTHS TO NATURAL MOTHER	
1102	CHECK 1101: TWO OR MORE BIRTHS ☐ ONLY ONE BIRTH (RESPONDENT ONLY) ☐ → 1200		
1103	How many of these births did your mother have before you were born?	NUMBER OF PRECEDING BIRTHS	

1104	What was the name given to your oldest (next oldest) brother or sister?	(1) _____	(2) _____	(3) _____	(4) _____	(5) _____	(6) _____
1105	Is (NAME) male or female?	MALE 1 FEMALE 2	MALE 1 FEMALE 2	MALE 1 FEMALE 2	MALE 1 FEMALE 2	MALE 1 FEMALE 2	MALE 1 FEMALE 2
1106	Is (NAME) still alive?	YES . . . 1 NO . . . 2 → GO TO 1108 DK . . . 8 → GO TO (2)	YES . . . 1 NO . . . 2 → GO TO 1108 DK . . . 8 → GO TO (3)	YES . . . 1 NO . . . 2 → GO TO 1108 DK . . . 8 → GO TO (4)	YES . . . 1 NO . . . 2 → GO TO 1108 DK . . . 8 → GO TO (5)	YES . . . 1 NO . . . 2 → GO TO 1108 DK . . . 8 → GO TO (6)	YES . . . 1 NO . . . 2 → GO TO 1108 DK . . . 8 → GO TO (7)
1107	How old is (NAME)?	☐☐ GO TO (2)	☐☐ GO TO (3)	☐☐ GO TO (4)	☐☐ GO TO (5)	☐☐ GO TO (6)	☐☐ GO TO (7)
1108	How many years ago did (NAME) die?	☐☐	☐☐	☐☐	☐☐	☐☐	☐☐
1109	How old was (NAME) when he/she died?	☐☐ IF MALE OR DIED BEFORE 12 YEARS OF AGE GO TO (2)	☐☐ IF MALE OR DIED BEFORE 12 YEARS OF AGE GO TO (3)	☐☐ IF MALE OR DIED BEFORE 12 YEARS OF AGE GO TO (4)	☐☐ IF MALE OR DIED BEFORE 12 YEARS OF AGE GO TO (5)	☐☐ IF MALE OR DIED BEFORE 12 YEARS OF AGE GO TO (6)	☐☐ IF MALE OR DIED BEFORE 12 YEARS OF AGE GO TO (7)
1110	Was (NAME) pregnant when she died?	YES . . . 1 → GO TO 1113 NO . . . 2	YES . . . 1 → GO TO 1113 NO . . . 2	YES . . . 1 → GO TO 1113 NO . . . 2	YES . . . 1 → GO TO 1113 NO . . . 2	YES . . . 1 → GO TO 1113 NO . . . 2	YES . . . 1 → GO TO 1113 NO . . . 2
1111	Did (NAME) die during childbirth?	YES . . . 1 → GO TO 1113 NO . . . 2	YES . . . 1 → GO TO 1113 NO . . . 2	YES . . . 1 → GO TO 1113 NO . . . 2	YES . . . 1 → GO TO 1113 NO . . . 2	YES . . . 1 → GO TO 1113 NO . . . 2	YES . . . 1 → GO TO 1113 NO . . . 2
1112	Did (NAME) die within two months after the end of a pregnancy or childbirth?	YES . . . 1 NO . . . 2	YES . . . 1 NO . . . 2	YES . . . 1 NO . . . 2	YES . . . 1 NO . . . 2	YES . . . 1 NO . . . 2	YES . . . 1 NO . . . 2
1113	How many live born children did (NAME) give birth to during her lifetime (before this pregnancy)?	☐☐	☐☐	☐☐	☐☐	☐☐	☐☐

IF NO MORE BROTHERS OR SISTERS, GO TO 1200

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES					SKIP
1104	What was the name given to your oldest (next oldest) brother or sister?	(7) _____	(8) _____	(9) _____	(10) _____	(11) _____	(12) _____
1105	Is (NAME) male or female?	MALE 1 FEMALE 2	MALE 1 FEMALE 2	MALE 1 FEMALE 2	MALE 1 FEMALE 2	MALE 1 FEMALE 2	MALE 1 FEMALE 2
1106	Is (NAME) still alive?	YES . . . 1 NO . . . 2 → GO TO 1108 DK . . . 8 → GO TO (8)	YES . . . 1 NO . . . 2 → GO TO 1108 DK . . . 8 → GO TO (9)	YES . . . 1 NO . . . 2 → GO TO 1108 DK . . . 8 → GO TO (10)	YES . . . 1 NO . . . 2 → GO TO 1108 DK . . . 8 → GO TO (11)	YES . . . 1 NO . . . 2 → GO TO 1108 DK . . . 8 → GO TO (12)	YES . . . 1 NO . . . 2 → GO TO 1108 DK . . . 8 → GO TO (13)
1107	How old is (NAME)?	GO TO (8)	GO TO (9)	GO TO (10)	GO TO (11)	GO TO (12)	GO TO (13)
1108	How many years ago did (NAME) die?						
1109	How old was (NAME) when he/she died?	IF MALE OR DIED BEFORE 12 YEARS OF AGE GO TO (8)	IF MALE OR DIED BEFORE 12 YEARS OF AGE GO TO (9)	IF MALE OR DIED BEFORE 12 YEARS OF AGE GO TO (10)	IF MALE OR DIED BEFORE 12 YEARS OF AGE GO TO (11)	IF MALE OR DIED BEFORE 12 YEARS OF AGE GO TO (12)	IF MALE OR DIED BEFORE 12 YEARS OF AGE GO TO (13)
1110	Was (NAME) pregnant when she died?	YES . . . 1 → GO TO 1113 NO . . . 2	YES . . . 1 → GO TO 1113 NO . . . 2	YES . . . 1 → GO TO 1113 NO . . . 2	YES . . . 1 → GO TO 1113 NO . . . 2	YES . . . 1 → GO TO 1113 NO . . . 2	YES . . . 1 → GO TO 1113 NO . . . 2
1111	Did (NAME) die during childbirth?	YES . . . 1 → GO TO 1113 NO . . . 2	YES . . . 1 → GO TO 1113 NO . . . 2	YES . . . 1 → GO TO 1113 NO . . . 2	YES . . . 1 → GO TO 1113 NO . . . 2	YES . . . 1 → GO TO 1113 NO . . . 2	YES . . . 1 → GO TO 1113 NO . . . 2
1112	Did (NAME) die within two months after the end of a pregnancy or childbirth?	YES . . . 1 NO . . . 2	YES . . . 1 NO . . . 2	YES . . . 1 NO . . . 2	YES . . . 1 NO . . . 2	YES . . . 1 NO . . . 2	YES . . . 1 NO . . . 2
1113	How many live born children did (NAME) give birth to during her lifetime (before this pregnancy)?						

IF NO MORE BROTHERS OR SISTERS, GO TO 1200.

SECTION 12. DOMESTIC VIOLENCE

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
1200	CHECK HOUSEHOLD QUESTIONNAIRE, COLUMN 9. WOMAN SELECTED FOR THIS SECTION WOMAN NOT SELECTED		1301
1201	CHECK FOR PRESENCE OF OTHERS: DO NOT CONTINUE UNTIL EFFECTIVE PRIVACY IS ENSURED. PRIVACY OBTAINED . . . . . 1 PRIVACY NOT POSSIBLE 2		1234
	READ TO THE RESPONDENT Now I would like to ask you questions about some other important aspects of a woman's life. I know that some of these questions are very personal. However, your answers are crucial for helping to understand the condition of women in Kenya. Let me assure you that your answers are completely confidential and will not be told to anyone and no one else will know that you were asked these questions.		
1202	CHECK 601 AND 602: CURRENTLY MARRIED/ LIVING WITH A MAN FORMERLY MARRIED/ LIVED WITH A MAN (READ IN PAST TENSE) NEVER MARRIED/ NEVER LIVED WITH A MAN		1214
1203	First, I am going to ask you about some situations which happen to some women. Please tell me if these apply to your relationship with your (last) husband/partner?		
	a) He (is/was) jealous or angry if you (talk/talked) to other men?	JEALOUS 1 2 8	
	b) He frequently (accuses/accused) you of being unfaithful?	ACCUSES 1 2 8	
	c) He (does/did) not permit you to meet your female friends?	NOT MEET FRIENDS 1 2 8	
	d) He (tries/tried) to limit your contact with your family?	NO FAMILY 1 2 8	
	e) He (insists/insisted) on knowing where you (are/were) at all times?	WHERE YOU ARE . . . 1 2 8	
	f) He (does/did) not trust you with any money?	MONEY 1 2 8	
1204	Now if you will permit me, I need to ask some more questions about your relationship with your (last) husband/partner. If we should come to any question that you do not want to answer, just let me know and we will go on to the next question.		
	A (Does/did) your (last) husband/partner ever:	B How often did this happen during the last 12 months: often, only sometimes, or not at all?	
	a) say or do something to humiliate you in front of others?	YES 1 → OFTEN 1 SOMETIMES 2 NOT AT ALL 3 NO 2 ↓	
	b) threaten to hurt or harm you or someone close to you?	YES 1 → OFTEN 1 SOMETIMES 2 NOT AT ALL 3 NO 2 ↓	
	c) insult you or make you feel bad about yourself?	YES 1 → OFTEN 1 SOMETIMES 2 NOT AT ALL 3 NO 2 ↓	

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
1205	A (Does/did) your (last) husband/partner ever do any of the following things to you:	B How often did this happen during the last 12 months: often, only sometimes, or not at all?	

				OFTEN	SOME-TIMES	NOT AT ALL
a)	push you, shake you, or throw something at you?	YES 1 →		1	2	3
		NO 2 ↓				
b)	slap you?	YES 1 →		1	2	3
		NO 2 ↓				
c)	twist your arm or pull your hair?	YES 1 →		1	2	3
		NO 2 ↓				
d)	punch you with his fist or with something that could hurt you?	YES 1 →		1	2	3
		NO 2 ↓				
e)	kick you, drag you or beat you up?	YES 1 →		1	2	3
		NO 2 ↓				
f)	try to choke you or burn you on purpose?	YES 1 →		1	2	3
		NO 2 ↓				
g)	threaten or attack you with a knife, gun, or any other weapon?	YES 1 →		1	2	3
		NO 2 ↓				
h)	physically force you to have sexual intercourse with him even when you did not want to?	YES 1 →		1	2	3
		NO 2 ↓				
i)	force you to perform any sexual acts you did not want to?	YES 1 →		1	2	3
		NO 2 ↓				

1206	CHECK 1205 (a-i): AT LEAST ONE 'YES' ↓	NOT A SINGLE 'YES' →	1209
1207	How long after you first got married to/started living with your (last) husband/partner did (this/any of these things) first happen? IF LESS THAN ONE YEAR, RECORD '00'.	NUMBER OF YEARS . . . . . ☐☐ BEFORE MARRIAGE/BEFORE LIVING TOGETHER 95	
1208	Did the following ever happen as a result of what your (last) husband/partner did to you: a) You had cuts, bruises or aches? b) You had eye injuries, sprains, dislocations, or burns? c) You had deep wounds, broken bones, broken teeth, or any other serious injury?	YES . . . . . 1 NO . . . . . 2 YES . . . . . 1 NO . . . . . 2 YES . . . . . 1 NO 2	
1209	Have you ever hit, slapped, kicked, or done anything else to physically hurt your (last) husband/partner at times when he was not already beating or physically hurting you?	YES . . . . . 1 NO 2	→ 1212
1210	CHECK 603: RESPONDENT IS **NOT** A WIDOW ↓	RESPONDENT IS A WIDOW →	1212
1211	In the last 12 months, how often have you done this to your husband/partner: often, only sometimes, or not at all?	OFTEN . . . . . 1 SOMETIMES . . . . . 2 NOT AT ALL 3	

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
1212	Does (did) your husband/partner drink alcohol?	YES . . . . . 1 NO 2	→ 1214
1213	How often does (did) he get drunk: often, only sometimes, or never?	OFTEN . . . . . 1 SOMETIMES . . . . . 2 NEVER 3	
1214	CHECK 601 AND 602: EVER MARRIED/LIVED WITH A MAN → From the time you were 15 years old has anyone other than your (current/last) husband/partner hit, slapped, kicked, or done anything else to hurt you physically? NEVER MARRIED/ NEVER LIVED WITH A MAN → From the time you were 15 years old has anyone ever hit, slapped, kicked, or done anything else to hurt you physically?	YES . . . . . 1 NO . . . . . 2 REFUSED TO ANSWER/ NO ANSWER 3	→ 1220
1215	Who has hurt you in this way? Anyone else? RECORD ALL MENTIONED.	MOTHER/STEP-MOTHER . . . . . A FATHER/STEP-FATHER . . . . . B SISTER/BROTHER . . . . . C DAUGHTER/SON . . . . . D OTHER RELATIVE . . . . . E FORMER HUSBAND/PARTNER . . . . . F CURRENT BOYFRIEND . . . . . G FORMER BOYFRIEND . . . . . H MOTHER-IN-LAW . . . . . I FATHER-IN-LAW . . . . . J OTHER IN-LAW . . . . . K TEACHER . . . . . L EMPLOYER/SOMEONE AT WORK . . . M POLICE/SOLDIER . . . . . N OTHER _____ X (SPECIFY)	
1216	In the last 12 months, how often have you been hit, slapped, kicked, or physically hurt by this/these person(s): often, only sometimes, or not at all?	OFTEN . . . . . 1 SOMETIMES . . . . . 2 NOT AT ALL 3	
1220	CHECK 618: EVER HAD SEX? HAS EVER HAD SEX NEVER HAD SEX →		1225
1221	The first time you had sexual intercourse, would you say that you had it because you wanted to, or because you were forced to have it against your will?	WANTED TO . . . . . 1 FORCED TO . . . . . 2 REFUSED TO ANSWER/ NO RESPONSE 3	
1222	CHECK 601 AND 602: EVER MARRIED/LIVED WITH A MAN → In the last 12 months, has anyone other than your (current/last) husband/ partner forced you to have sexual intercourse against your will? NEVER MARRIED/ NEVER LIVED WITH A MAN → In the last 12 months has anyone forced you to have sexual intercourse against your will?	YES . . . . . 1 NO . . . . . 2 REFUSED TO ANSWER/ NO ANSWER 3	
1223	CHECK 1221 AND 1222: 1221 ='1' OR '3' **AND** 1222 ='2' OR '3' OTHER →		1226
1224	CHECK 1205A(h) and 1205A(i): 1205A(h) IS NOT '1' **AND** 1205A(i) IS NOT '1' OTHER →		1228

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
1225	At any time in your life, as a child or as an adult, has anyone ever forced you in any way to have sexual intercourse or perform any other sexual acts?	YES . . . . . 1 NO . . . . . 2 REFUSED TO ANSWER/ NO ANSWER 3	→ 1228
1226	How old were you the first time you were forced to have sexual intercourse or perform any other sexual acts?	AGE IN COMPLETED YEAR . . . [ ][ ] DON'T KNOW 98	
1227	Who was the person who was forcing you at that time?	CURRENT HUSBAND/PARTNER . . . 01 FORMER HUSBAND/PARTNER . . . . . 02 CURRENT/FORMER BOYFRIEND . . . 03 FATHER . . . . . 04 STEP FATHER . . . . . 05 OTHER RELATIVE . . . . . 06 IN-LAW . . . . . 07 OWN FRIEND/ACQUAINTANCE . . . . . 08 FAMILY FRIEND . . . . . 09 TEACHER . . . . . 10 EMPLOYER/SOMEONE AT WORK . . . 11 POLICE/SOLDIER . . . . . 12 PRIEST/RELIGIOUS LEADER . . . . . 13 STRANGER . . . . . 14 OTHER_____ . . . 96 (SPECIFY)	
1228	CHECK 1205A (a-i), 1214, 1222 AND 1225: AT LEAST ONE 'YES' ↓ NOT A SINGLE 'YES' → 1232		
1229	Thinking about what you yourself have experienced among the different things we have been talking about, have you ever tried to seek help to stop (the/these) person(s) from doing this to you again?	YES . . . . . 1 NO 2	→ 1231
1230	From whom have you sought help? Anyone else? RECORD ALL MENTIONED.	OWN FAMILY . . . . . A HUSBAND/PARTNER'S FAMILY . . . . . B CURRENT/LAST/LATE HUSBAND/PARTNER . . . . . C CURRENT/FORMER BOYFRIEND . . . D FRIEND . . . . . E NEIGHBOR . . . . . F RELIGIOUS LEADER . . . . . G DOCTOR/MEDICAL PERSONNEL . . . H POLICE . . . . . I LAWYER . . . . . J SOCIAL SERVICE ORGANIZATION . . . K COMMUNITYLEADER/LOCAL ADMN L OTHER _____ X (SPECIFY)	→ 1232
1231	Have you ever told any one else about this?	YES . . . . . 1 NO 2	
1232	As far as you know, did your father ever beat your mother?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	

THANK THE RESPONDENT FOR HER COOPERATION AND REASSURE HER ABOUT THE CONFIDENTIALITY OF HER ANSWERS. FILL OUT THE QUESTIONS BELOW WITH REFERENCE TO THE DOMESTIC VIOLENCE MODULE ONLY.

1233	DID YOU HAVE TO INTERRUPT THE INTERVIEW BECAUSE SOME ADULT WAS TRYING TO LISTEN, OR CAME INTO THE ROOM, OR INTERFERED IN ANY OTHER WAY?		YES ONCE	YES, MORE THAN ONCE	NO
		HUSBAND	1	2	3
		OTHER MALE ADULT . . .	1	2	3
		FEMALE ADULT	1	2	3
1234	INTERVIEWER'S COMMENTS / EXPLANATION FOR NOT COMPLETING THE DOMESTIC VIOLENCE MODULE				

Serial number_____

CONFIDENTIAL

KENYA NATIONAL BUREAU OF STATISTICS
KENYA DEMOGRAPHIC AND HEALTH SURVEY 2008
HOUSEHOLD QUESTIONNAIRE

IDENTIFICATION

PROVINCE* _____

DISTRICT _____

LOCATION/TOWN _____

SUBLOCATION/WARD _____

NASSEP CLUSTER NUMBER . . . . . .

KDHS CLUSTER NUMBER . . . . . .

HOUSEHOLD NUMBER . . . . . .

NAIROBI/MOMBASA/KISUMU=1; NAKURU/ELDORET/THIKA/NYERI=2;
SMALL TOWN=3; RURAL=4 . . . . . .

NAME OF HOUSEHOLD HEAD _____

IS HOUSEHOLD SELECTED FOR MAN'S SURVEY? (YES=1; NO=2) . . . . . .

INTERVIEWER VISITS

	1	2	3	FINAL VISIT
DATE				DAY / MONTH / YEAR (2 0 0)
INTERVIEWER'S NAME				INT. CODE
RESULT**				FINAL RESULT
NEXT VISIT: DATE				TOTAL NUMBER OF VISITS
TIME				

**RESULT CODES:
1 COMPLETED
2 NO HOUSEHOLD MEMBER AT HOME OR NO COMPETENT RESPONDENT HOME AT TIME OF VISIT
3 ENTIRE HOUSEHOLD ABSENT FOR EXTENDED PERIOD OF TIME
4 POSTPONED
5 REFUSED
6 DWELLING VACANT OR ADDRESS NOT A DWELLING
7 DWELLING DESTROYED
8 DWELLING NOT FOUND
9 OTHER _____
(SPECIFY)

ENGLISH

TOTAL PERSONS IN HOUSEHOLD

TOTAL ELIGIBLE WOMEN

TOTAL ELIGIBLE MEN

LINE NO. OF RESPONDENT TO HH QUESTION.

SUPERVISOR	FIELD EDITOR	OFFICE EDITOR	KEYED BY
NAME _____	NAME _____		
DATE _____	DATE _____		

* Province: NAIROBI=1; CENTRAL=2; COAST=3; EASTERN=4; NYANZA=5; R.VALLEY=6; WESTERN=7; NORTHEASTERN=8

INTRODUCTION AND CONSENT

Hello. My name is _____ and I am working with the Kenya National Bureau of Statistics. We are conducting a national survey that asks about various health issues. We would very much appreciate your participation in this survey.
This information will help the government to plan health services. The survey usually takes between 30 to 60 minutes to complete. Whatever information you provide will be kept confidential and will not be shared with anyone other than members of our survey team.

Participation in this survey is voluntary, and if we should come to any question you don't want to answer, just let me know and I will go on to the next question; or you can stop the interview at any time. However, we hope that you will participate in this survey since your views are important.
At this time, do you want to ask me anything about the survey?

May I begin the interview now?

Signature of interviewer: _____ Date: _____

RESPONDENT AGREES TO BE INTERVIEWED . . . 1 RESPONDENT DOES NOT AGREE TO BE INTERVIEWED . . . 2 → END

HOUSEHOLD SCHEDULE

Now we would like some information about the people who usually live in your household or who are staying with you now.

LINE NO.	USUAL RESIDENTS AND VISITORS	RELATIONSHIP TO HEAD OF HOUSEHOLD	SEX	RESIDENCE		AGE	IF AGE 15 OR OLDER: MARITAL STATUS	ELIGIBILITY		
	Please give me the names of the persons who usually live in your household and guests of the household who stayed here last night, starting with the head of the household. AFTER LISTING THE NAMES AND RECORDING THE RELATIONSHIP AND SEX FOR EACH PERSON, ASK QUESTIONS 2A-2C TO BE SURE THAT THE LISTING IS COMPLETE. THEN ASK APPROPRIATE QUESTIONS IN COLUMNS 5-33 FOR EACH PERSON.	What is the relationship of (NAME) to the head of the household? SEE CODES BELOW.	Is (NAME) male or female?	Does (NAME) usually live here?	Did (NAME) stay here last night?	How old is (NAME)?	What is (NAME'S) current marital status? 1 = MARRIED OR LIVING TOGETHER 2 = DIVORCED/ SEPARATED 3 = WIDOWED 4 = NEVER-MARRIED AND NEVER LIVED TOGETHER	CIRCLE LINE NUMBER OF ALL **WOMEN** AGE 15-49 * LINE NO. OF WOMAN SELECTED FOR Qs. ON DOMESTIC VIOLENCE.	CIRCLE LINE NUMBER OF ALL **CHILDREN** AGE 0-5	CIRCLE LINE NUMBER OF ALL **MEN** AGE 15 - 54
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
01			M F 1 2	Y N 1 2	Y N 1 2	IN YEARS		01	01	01
02			1 2	1 2	1 2			02	02	02
03			1 2	1 2	1 2			03	03	03
04			1 2	1 2	1 2			04	04	04
05			1 2	1 2	1 2			05	05	05
06			1 2	1 2	1 2			06	06	06
07			1 2	1 2	1 2			07	07	07
08			1 2	1 2	1 2			08	08	08
09			1 2	1 2	1 2			09	09	09
10			1 2	1 2	1 2			10	10	10

CODES FOR Q. 3: RELATIONSHIP TO HEAD OF HOUSEHOLD

01 = HEAD
02 = WIFE OR HUSBAND
03 = SON OR DAUGHTER
04 = SON-IN-LAW OR DAUGHTER-IN-LAW
05 = GRANDCHILD
06 = PARENT
07 = PARENT-IN-LAW
08 = BROTHER OR SISTER
09 = NIECE/NEPHEW BY BLOOD
10 = NIECE/NEPHEW BY MARRIAGE
11 = OTHER RELATIVE
12 = ADOPTED/FOSTER/ STEPCHILD
13 = NOT RELATED
98 = DON'T KNOW

2A) Just to make sure that I have a complete listing. Are there any other persons such as small children or infants that we have not listed? YES → ADD TO TABLE NO

2B) Are there any other people who may not be members of your family, such as domestic servants, lodgers, or friends who usually live here YES → ADD TO TABLE NO

2C) Are there any guests or temporary visitors staying here, or anyone else who stayed here last night, who have not been listed? YES → ADD TO TABLE NO

	IF AGE 4 YEARS OR OLDER		IF AGE 4-24 YEARS				IF AGE 0-4 YEARS	
LINE NO.	EVER ATTENDED SCHOOL		CURRENT/RECENT SCHOOL ATTENDANCE				BIRTH REGISTRATION	
	Has (NAME) ever attended school?	What is the highest level of school (NAME) has attended? SEE CODES BELOW. What is the highest grade (NAME) completed at that level? SEE CODES BELOW.	Did (NAME) attend school at any time during the 2008 school year?	During the 2008 school year, what level and grade is/was (NAME) attending? SEE CODES BELOW.	Did (NAME) attend school at any time during the 2007 school year?	During the 2007 school year, what level and grade did (NAME) attend? SEE CODES BELOW.	Has (NAME) ever been registered with the civil authority? 1 = YES, REGISTERED WITH BIRTH CERTIFICATE 2 = YES, REGISTERED WITHOUT BIRTH CERTIFICATE 8 = DON'T KNOW 3 = NOT REGISTERED	Why was (NAME) never registered 1=TOO FAR 2=LITTLE MONEY 3=NOT AWARE 4=NOT NECESARY 5=NOMADIC LIFE DIFFICULT TERRAIN INSECURITY 8=OTHER
	(23)	(24)	(25)	(26)	(27)	(28)	(32)	(33)
01	Y N 1 2 ↓ GO TO 32	LEVEL GRADE ☐ ☐☐	Y N 1 2 ↓ GO TO 27	LEVEL GRADE ☐ ☐☐	Y N 1 2 ↓ GO TO 32	LEVEL GRADE ☐ ☐☐	Y Y DK NO 1 2 8 3 ↓ ↓ ↓ ↓ TO NEXT LINE TO 33	☐
02	1 2 ↓ GO TO 32	☐ ☐☐	1 2 ↓ GO TO 27	☐ ☐☐	1 2 ↓ GO TO 32	☐ ☐☐	1 2 8 3 ↓ ↓ ↓ ↓ TO NEXT LINE TO 33	☐
03	1 2 ↓ GO TO 32	☐ ☐☐	1 2 ↓ GO TO 27	☐ ☐☐	1 2 ↓ GO TO 32	☐ ☐☐	1 2 8 3 ↓ ↓ ↓ ↓ TO NEXT LINE TO 33	☐
04	1 2 ↓ GO TO 32	☐ ☐☐	1 2 ↓ GO TO 27	☐ ☐☐	1 2 ↓ GO TO 32	☐ ☐☐	1 2 8 3 ↓ ↓ ↓ ↓ TO NEXT LINE TO 33	☐
05	1 2 ↓ GO TO 32	☐ ☐☐	1 2 ↓ GO TO 27	☐ ☐☐	1 2 ↓ GO TO 32	☐ ☐☐	1 2 8 3 ↓ ↓ ↓ ↓ TO NEXT LINE TO 33	☐
06	1 2 ↓ GO TO 32	☐ ☐☐	1 2 ↓ GO TO 27	☐ ☐☐	1 2 ↓ GO TO 32	☐ ☐☐	1 2 8 3 ↓ ↓ ↓ ↓ TO NEXT LINE TO 33	☐
07	1 2 ↓ GO TO 32	☐ ☐☐	1 2 ↓ GO TO 27	☐ ☐☐	1 2 ↓ GO TO 32	☐ ☐☐	1 2 8 3 ↓ ↓ ↓ ↓ TO NEXT LINE TO 33	☐
08	1 2 ↓ GO TO 32	☐ ☐☐	1 2 ↓ GO TO 27	☐ ☐☐	1 2 ↓ GO TO 32	☐ ☐☐	1 2 8 3 ↓ ↓ ↓ ↓ TO NEXT LINE TO 33	☐
09	1 2 ↓ GO TO 32	☐ ☐☐	1 2 ↓ GO TO 27	☐ ☐☐	1 2 ↓ GO TO 32	☐ ☐☐	1 2 8 3 ↓ ↓ ↓ ↓ TO NEXT LINE TO 33	☐
10	1 2 ↓ GO TO 32	☐ ☐☐	1 2 ↓ GO TO 27	☐ ☐☐	1 2 ↓ GO TO 32	☐ ☐☐	1 2 8 3 ↓ ↓ ↓ ↓ TO NEXT LINE TO 33	☐

CODES FOR Qs. 24, 26, AND 28: EDUCATION

LEVEL	GRADE
0= NURSERY/KINDERGARTEN	00 = LESS THAN 1 YEAR COMPLETED
1 = PRIMARY	(USE '00' FOR Q. 24 ONLY.
2= POST-PRIMARY, VOCATIONAL	THIS CODE IS NOT ALLOWED
3 = SECONDARY, A LEVEL	FOR QS. 26 AND 28)
4 = COLLEGE (MIDDLE LEVEL)	
5= UNIVERSITY	98 = DON'T KNOW
8 = DON'T KNOW	

							IF AGE 15 OR OLDER			
LINE NO.	USUAL RESIDENTS AND VISITORS	RELATIONSHIP TO HEAD OF HOUSEHOLD	SEX	RESIDENCE		AGE	MARITAL STATUS	ELIGIBILITY		
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(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
			M F	Y N	Y N	IN YEARS				
11			1 2	1 2	1 2			11	11	11
12			1 2	1 2	1 2			12	12	12
13			1 2	1 2	1 2			13	13	13
14			1 2	1 2	1 2			14	14	14
15			1 2	1 2	1 2			15	15	15
16			1 2	1 2	1 2			16	16	16
17			1 2	1 2	1 2			17	17	17
18			1 2	1 2	1 2			18	18	18
19			1 2	1 2	1 2			19	19	19
20			1 2	1 2	1 2			20	20	20

TICK HERE IF CONTINUATION SHEET USED ☐

2A) Just to make sure that I have a complete listing. Are there any other persons such as small children or infants that we have not listed? YES ☐ → ADD TO TABLE NO ☐

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11	Y N 1 2 ↓ GO TO 32	LEVEL GRADE ☐☐☐	Y N 1 2 ↓ GO TO 27	LEVEL GRADE ☐☐☐	Y N 1 2 ↓ GO TO 32	LEVEL GRADE ☐☐☐	Y Y DK NO 1 2 8 3 ↓ ↓ ↓ ↓ TO NEXT LINE TO 33	☐
12	1 2 ↓ GO TO 32	☐☐☐	1 2 ↓ GO TO 27	☐☐☐	1 2 ↓ GO TO 32	☐☐☐	1 2 8 3 ↓ ↓ ↓ ↓ TO NEXT LINE TO 33	☐
13	1 2 ↓ GO TO 32	☐☐☐	1 2 ↓ GO TO 27	☐☐☐	1 2 ↓ GO TO 32	☐☐☐	1 2 8 3 ↓ ↓ ↓ ↓ TO NEXT LINE TO 33	☐
14	1 2 ↓ GO TO 32	☐☐☐	1 2 ↓ GO TO 27	☐☐☐	1 2 ↓ GO TO 32	☐☐☐	1 2 8 3 ↓ ↓ ↓ ↓ TO NEXT LINE TO 33	☐
15	1 2 ↓ GO TO 32	☐☐☐	1 2 ↓ GO TO 27	☐☐☐	1 2 ↓ GO TO 32	☐☐☐	1 2 8 3 ↓ ↓ ↓ ↓ TO NEXT LINE TO 33	☐
16	1 2 ↓ GO TO 32	☐☐☐	1 2 ↓ GO TO 27	☐☐☐	1 2 ↓ GO TO 32	☐☐☐	1 2 8 3 ↓ ↓ ↓ ↓ TO NEXT LINE TO 33	☐
17	1 2 ↓ GO TO 32	☐☐☐	1 2 ↓ GO TO 27	☐☐☐	1 2 ↓ GO TO 32	☐☐☐	1 2 8 3 ↓ ↓ ↓ ↓ TO NEXT LINE TO 33	☐
18	1 2 ↓ GO TO 32	☐☐☐	1 2 ↓ GO TO 27	☐☐☐	1 2 ↓ GO TO 32	☐☐☐	1 2 8 3 ↓ ↓ ↓ ↓ TO NEXT LINE TO 33	☐
19	1 2 ↓ GO TO 32	☐☐☐	1 2 ↓ GO TO 27	☐☐☐	1 2 ↓ GO TO 32	☐☐☐	1 2 8 3 ↓ ↓ ↓ ↓ TO NEXT LINE TO 33	☐
20	1 2 ↓ GO TO 32	☐☐☐	1 2 ↓ GO TO 27	☐☐☐	1 2 ↓ GO TO 32	☐☐☐	1 2 8 3 ↓ ↓ ↓ ↓ TO NEXT LINE TO 33	☐

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2= POST-PRIMARY, VOCATIONAL	
3 = SECONDARY, A LEVEL	
4 = COLLEGE (MIDDLE LEVEL)	
5= UNIVERSITY	98 = DON'T KNOW
8 = DON'T KNOW	

GRID TO SELECT ONE WOMAN PER HOUSEHOLD

LOOK AT THE LAST DIGIT OF THE **QUESTIONNAIRE** SERIAL NUMBER ON THE COVER PAGE. THIS IS THE NUMBER OF THE **ROW** YOU SHOULD GO TO.

CHECK THE TOTAL NUMBER OF WOMEN 15-49 IN COLUMN (9) OF THE HOUSEHOLD QUESTIONNAIRE. THIS IS THE NUMBER OF THE **COLUMN** YOU SHOULD GO TO.

FIND THE BOX WHERE THE ROW AND THE COLUMN MEET AND CIRCLE THE NUMBER THAT APPEARS IN THE BOX. THIS NUMBER IS USED TO IDENTIFY WHETHER THE FIRST ('1'), SECOND ('2'), THIRD ('3'), ETC. ELIGIBLE WOMAN LISTED IN THE HOUSEHOLD SCHEDULE WILL BE ASKED THE DOMESTIC VIOLENCE QUESTIONS.

PUT AN ASTERISK (*) NEXT TO THE LINE NUMBER OF THE SELECTED WOMAN IN COL.9.

EXAMPLE: IF THE QUESTIONNAIRE SERIAL NUMBER IS '3716', GO TO ROW '6'.
IF THERE ARE THREE ELIGIBLE WOMEN IN THE HOUSEHOLD, GO TO COLUMN '3'.
FIND THE BOX WHERE ROW '6' AND COLUMN '3' MEET. THE NUMBER IN THAT BOX ('2') INDICATES THAT THE SECOND ELIGIBLE WOMAN IN THE HOUSEHOLD LISTING SHOULD BE ASKED THE DOMESTIC VIOLENCE QUESTIONS.
SUPPOSE THE LINE NUMBERS OF THE THREE WOMEN ARE '02', '03', AND '07'. THE WOMAN TO BE ASKED THE DOMESTIC VIOLENCE QUESTIONS IS THE SECOND ONE, I.E., THE WOMAN ON LINE '03'.

LAST DIGIT OF THE QUESTIONNAIRE SERIAL NUMBER (ROW)	TOTAL NUMBER OF ELIGIBLE WOMEN IN HOUSEHOLD (COLUMN)							
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
0	1	2	2	4	3	6	5	4
1	1	1	3	1	4	1	6	5
2	1	2	1	2	5	2	7	6
3	1	1	2	3	1	3	1	7
4	1	2	3	4	2	4	2	8
5	1	1	1	1	3	5	3	1
6	1	2	2	2	4	6	4	2
7	1	1	3	3	5	1	5	3
8	1	2	1	4	1	2	6	4
9	1	1	2	1	2	3	7	5

HOUSEHOLD CHARACTERISTICS

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
101	What is the main source of drinking water for members of your household?	PIPED WATER PIPED INTO DWELLING . . . . . 11 PIPED TO COMPOUND/PLOT . . . . . 12 PUBLIC TAP/STANDPIPE . . . . . 13 TUBE WELL OR BOREHOLE . . . . . 21 DUG WELL PROTECTED WELL . . . . . 31 UNPROTECTED WELL . . . . . 32 WATER FROM SPRING PROTECTED SPRING . . . . . 41 UNPROTECTED SPRING . . . . . 42 RAINWATER . . . . . 51 TANKER TRUCK . . . . . 61 CART WITH SMALL TANK . . . . . 71 SURFACE WATER (RIVER/DAM/ LAKE/POND/STREAM/CANAL/ IRRIGATION CHANNEL) . . . . . 81 BOTTLED WATER . . . . . 91 OTHER _____ 96 (SPECIFY)	12 → 106 31, 32, 41, 42 → 103 51 → 106 61, 71, 81 → 103 96 → 103
102	What is the main source of water used by your household for other purposes such as cooking and handwashing?	PIPED WATER PIPED INTO DWELLING . . . . . 11 PIPED TO COMPOUND/PLOT . . . . . 12 PUBLIC TAP/STANDPIPE . . . . . 13 TUBE WELL OR BOREHOLE . . . . . 21 DUG WELL PROTECTED WELL . . . . . 31 UNPROTECTED WELL . . . . . 32 WATER FROM SPRING PROTECTED SPRING . . . . . 41 UNPROTECTED SPRING . . . . . 42 RAINWATER . . . . . 51 TANKER TRUCK . . . . . 61 CART WITH SMALL TANK . . . . . 71 SURFACE WATER (RIVER/DAM/ LAKE/POND/STREAM/CANAL/ IRRIGATION CHANNEL) . . . . . 81 OTHER _____ 96 (SPECIFY)	12 → 106 51 → 106
103	Where is that water source located?	IN OWN DWELLING . . . . . 1 IN OWN YARD/PLOT . . . . . 2 ELSEWHERE 3	1, 2 → 106
104	How long does it take to go there, get water, and come back?	MINUTES . . . . . ☐☐☐ MORE THAN 12 HOURS . . . . . 995 DON'T KNOW 998	
105	Who usually goes to this source to fetch the water for your household?	ADULT WOMAN . . . . . 1 ADULT MAN . . . . . 2 FEMALE CHILD UNDER 15 YEARS OLD . . . . . 3 MALE CHILD UNDER 15 YEARS OLD . . . . . 4 OTHER _____ 6 (SPECIFY)	

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
106	Do you do anything to the water to make it safer to drink?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	→ 108
107	What do you usually do to make the water safer to drink? Anything else? RECORD ALL MENTIONED.	BOIL . . . . . A ADD BLEACH/CHLORINE . . . . . B STRAIN THROUGH A CLOTH . . . . . C USE WATER FILTER (CERAMIC/ SAND/COMPOSITE/ETC.) . . . . . D SOLAR DISINFECTION . . . . . E LET IT STAND AND SETTLE . . . . . F OTHER _____ X (SPECIFY) DON'T KNOW . . . . . Z	
108	What kind of toilet facility do members of your household usually use?	FLUSH OR POUR FLUSH TOILET FLUSH TO PIPED SEWER SYSTEM . . . 11 FLUSH TO SEPTIC TANK . . . . . 12 FLUSH TO PIT LATRINE . . . . . 13 FLUSH TO SOMEWHERE ELSE . . . 14 FLUSH, DON'T KNOW WHERE . . . 15 PIT LATRINE VENTILATED IMPROVED PIT LATRINE . . . . . 21 PIT LATRINE WITH SLAB . . . . . 22 PIT LATRINE WITHOUT SLAB/ OPEN PIT . . . . . 23 COMPOSTING TOILET . . . . . 31 BUCKET TOILET . . . . . 41 HANGING TOILET/HANGING LATRINE . 51 NO FACILITY/BUSH/FIELD . . . . . 61 OTHER _____ 96 (SPECIFY)	→ 111
109	Do you share this toilet facility with other households?	YES . . . . . 1 NO 2	→ 111
110	How many households use this toilet facility?	NO. OF HOUSEHOLDS IF LESS THAN 10 . . . . . 0 [ ] 10 OR MORE HOUSEHOLDS . . . . . 95 DON'T KNOW 98	
111	Does your household have:	YES NO A clock or watch? — CLOCK/WATCH . . . . . 1 2 Electricity? — ELECTRICITY . . . . . 1 2 A radio? — RADIO . . . . . 1 2 A television? — TELEVISION . . . . . 1 2 A mobile telephone? — MOBILE TELEPHONE . . . . . 1 2 A non-mobile telephone? — NON-MOBILE TELEPHONE . 1 2 A refrigerator? — REFRIGERATOR . . . . . 1 2 A solar panel? — SOLAR PANEL 1 2	
112	What type of fuel does your household mainly use for cooking?	ELECTRICITY . . . . . 01 LPG/NATURAL GAS . . . . . 02 BIOGAS . . . . . 03 KEROSENE . . . . . 04 COAL, LIGNITE . . . . . 05 CHARCOAL . . . . . 06 WOOD . . . . . 07 STRAW/SHRUBS/GRASS . . . . . 08 AGRICULTURAL CROP . . . . . 09 ANIMAL DUNG . . . . . 10 NO FOOD COOKED IN HOUSEHOLD . . . . . 95 OTHER _____ 96 (SPECIFY)	→ 117

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
115	Is the cooking usually done in the house, in a separate building, or outdoors?	IN THE HOUSE . . . . . 1 IN A SEPARATE BUILDING . . . . . 2 OUTDOORS . . . . . 3 OTHER _____ 6 (SPECIFY)	→ 117
116	Do you have a separate room which is used as a kitchen?	YES . . . . . 1 NO 2	
117	MAIN MATERIAL OF THE FLOOR. RECORD OBSERVATION.	NATURAL FLOOR EARTH/SAND . . . . . 11 DUNG . . . . . 12 RUDIMENTARY FLOOR WOOD PLANKS . . . . . 21 PALM/BAMBOO . . . . . 22 FINISHED FLOOR PARQUET OR POLISHED WOOD . . . 31 VINYL OR ASPHALT STRIPS . . . . . 32 CERAMIC TILES . . . . . 33 CEMENT . . . . . 34 CARPET . . . . . 35 OTHER _____ 96 (SPECIFY)	
118	MAIN MATERIAL OF THE ROOF. RECORD OBSERVATION.	**NATURAL ROOFING** GRASS / THATCH / MAKUTI . . . . . 11 DUNG / MUD . . . . . 12 **RUDIMENTARY ROOFING** CORRUGATED IRON (MABATI) . . . . . 21 TIN CANS . . . . . 22 **FINISHED ROOFING** ASBESTOS SHEET . . . . . 31 CONCRETE . . . . . 32 TILES . . . . . 33 OTHER _____ 96 (SPECIFY)	
119	MAIN MATERIAL OF THE WALLS. RECORD OBSERVATION.	NATURAL WALLS NO WALLS . . . . . 11 CANE/PALM/TRUNKS . . . . . 12 DIRT . . . . . 13 RUDIMENTARY WALLS BAMBOO WITH MUD . . . . . 21 STONE WITH MUD . . . . . 22 UNCOVERED ADOBE . . . . . 23 PLYWOOD . . . . . 24 CARDBOARD . . . . . 25 REUSED WOOD . . . . . 26 FINISHED WALLS CEMENT . . . . . 31 STONE WITH LIME/CEMENT . . . . . 32 BRICKS . . . . . 33 CEMENT BLOCKS . . . . . 34 COVERED ADOBE . . . . . 35 WOOD PLANKS/SHINGLES . . . . . 36 OTHER _____ 96 (SPECIFY)	
120	How many rooms in this household are used for sleeping?	ROOMS	

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
121	Does any member of this household own:	**YES** **NO**	
	A bicycle?	BICYCLE 1 2	
	A motorcycle or motor scooter?	MOTORCYCLE/SCOOTER . . . 1 2	
	An animal-drawn cart?	ANIMAL-DRAWN CART 1 2	
	A car or truck?	CAR/TRUCK 1 2	
	A boat with a motor?	BOAT WITH MOTOR 1 2	
121A	Does your household own this structure (house, flat, shack), do you rent it, or do you live here without pay?	OWNS . . . . . 1 PAYS RENT/LEASE . . . . . 2 NO RENT,W. CONSENT OF OWNER . . . . . 3 NO RENT, SQUATTING 4	
121B	Does your household own the land on which the structure (house, flat, shack) sits?	OWNS . . . . . 1 PAYS RENT/LEASE . . . . . 2 NO RENT,W. CONSENT OF OWNER . . . . . 3 NO RENT, SQUATTING 4	
122	Does any member of this household own any agricultural land?	YES . . . . . 1 NO 2	→ 124
123	How many hectares of land (altogether) are owned by the members of this family. IF MORE THAN 95, WRITE '95.0'. IF UNKNOWN, WRITE '99.8'.	NUMBER OF HECTARES ..... ☐☐.☐	
124	Does this household own any livestock, herds, other farm animals, or poultry?	YES . . . . . 1 NO 2	→ 125A
125	How many of the following animals does this household own? IF NONE, WRITE '00'. IF MORE THAN 95, WRITE '95'. IF UNKNOWN, WRITE '98'.		
	Local cattle (indegeneous)?	CATTLE (INDIGENEOUS) . . . . . ☐☐	
	Milk cows or bulls?	COWS/BULLS . . . . . ☐☐	
	Horses, donkeys, or mules?	HORSES/DONKEYS/MULES . . . ☐☐	
	Goats?	GOATS . . . . . ☐☐	
	Sheep?	SHEEP . . . . . ☐☐	
	Chicken?	CHICKEN . . . . . ☐☐	
125A	At any time in the past 12 months, has anyone come into your house to spray the inside walls against mosquitoes?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	→ 127 → 127
125B	How many months ago was the house sprayed? IF LESS THAN ONE MONTH, WRITE '00'	MONTHS AGO . . . . . ☐☐	
125C	Who sprayed the house?	GOVERNMENT WORKER/PROGRAMME . 1 PRIVATE COMPANY . . . . . 2 OTHER_____ 6 (SPECIFY) DON'T KNOW 8	
127	Does your household have any mosquito nets that can be used while sleeping?	YES . . . . . 1 NO 2	→ 138
128	How many mosquito nets does your household have? IF 7 OR MORE NETS, RECORD '7'.	NUMBER OF NETS . . . . . ☐	

		NET #1	NET #2	NET #3
129	ASK THE RESPONDENT TO SHOW YOU THE NETS IN THE HOUSEHOLD. IF MORE THAN 3 NETS, USE ADDITIONAL QUESTIONNAIRE(S).	OBSERVED ..... 1 NOT OBSERVED . 2	OBSERVED ..... 1 NOT OBSERVED . 2	OBSERVED ..... 1 NOT OBSERVED . 2
130	How many months ago did your household obtain the mosquito net? IF LESS THAN ONE MONTH, RECORD '00'.	MONTHS AGO ..... [ ][ ] 37 OR MORE MONTHS AGO ... 95 NOT SURE 98	MONTHS AGO ..... [ ][ ] 37 OR MORE MONTHS AGO ... 95 NOT SURE 98	MONTHS AGO ..... [ ][ ] 37 OR MORE MONTHS AGO ... 95 NOT SURE 98
131	OBSERVE OR ASK THE BRAND/ TYPE OF MOSQUITO NET.	'LONG LASTING' NET PERMANET ..... 11 OLYSET .... 12 SUPANET EXTRA 13 OTHER/ DK BRAND ..... 16 (SKIP TO 135) 'CONVENTIONAL' NET KINGA NET ..... 21 SUPANET ..... 22 UNBRANDED RURAL NET ... 23 OTHER/ DK BRAND ..... 26 (SKIP TO 133) OTHER .... 31 DK BRAND 98	'LONG LASTING' NET PERMANET ..... 11 OLYSET .... 12 SUPANET EXTRA 13 OTHER/ DK BRAND ..... 16 (SKIP TO 135) 'CONVENTIONAL' NET KINGA NET ..... 21 SUPANET ..... 22 UNBRANDED RURAL NET ... 23 OTHER/ DK BRAND ..... 26 (SKIP TO 133) OTHER .... 31 DK BRAND 98	'LONG LASTING' NET PERMANET ..... 11 OLYSET .... 12 SUPANET EXTRA 13 OTHER/ DK BRAND ..... 16 (SKIP TO 135) 'CONVENTIONAL' NET KINGA NET ..... 21 SUPANET ..... 22 UNBRANDED RURAL NET ... 23 OTHER/ DK BRAND ..... 26 (SKIP TO 133) OTHER .... 31 DK BRAND 98
132	When you got the net, was it treated with an insecticide to kill or repel mosquitos?	YES .... 1 NO .... 2 NOT SURE 8	YES .... 1 NO .... 2 NOT SURE 8	YES .... 1 NO .... 2 NOT SURE 8
133	Since you got the mosquito net, was it ever soaked or dipped in a liquid to kill or repel mosquitos?	YES .... 1 NO .... 2 (SKIP TO 135) NOT SURE 8	YES .... 1 NO .... 2 (SKIP TO 135) NOT SURE 8	YES .... 1 NO .... 2 (SKIP TO 135) NOT SURE 8
134	How many months ago was the net last soaked or dipped? IF LESS THAN ONE MONTH, RECORD '00'.	MONTHS AGO ..... [ ][ ] 25 OR MORE MONTHS AGO ... 95 NOT SURE 98	MONTHS AGO ..... [ ][ ] 25 OR MORE MONTHS AGO ... 95 NOT SURE 98	MONTHS AGO ..... [ ][ ] 25 OR MORE MONTHS AGO ... 95 NOT SURE 98
134A	The <u>last</u> time the net was treated, was a liquid from a packet like this added to the treatment solution? SHOW SACHET FOR K-O TAB 1-2-3 BINDING AGENT.	YES .... 1 NO .... 2 NOT SURE 8	YES .... 1 NO .... 2 NOT SURE 8	YES .... 1 NO .... 2 NOT SURE 8
134B	The <u>last</u> time the net was treated, was it treated as part of a net retreatment campaign?	YES .... 1 NO .... 2 NOT SURE 8	YES .... 1 NO .... 2 NOT SURE 8	YES .... 1 NO .... 2 NOT SURE 8
135	Did anyone sleep under this mosquito net last night?	YES .... 1 NO .... 2 (SKIP TO 137) NOT SURE 8	YES .... 1 NO .... 2 (SKIP TO 137) NOT SURE 8	YES .... 1 NO .... 2 (SKIP TO 137) NOT SURE 8

		NET #1	NET #2	NET #3
136	Who slept under this mosquito net last night? RECORD THE PERSON'S LINE NUMBER FROM THE HOUSEHOLD SCHEDULE.	NAME_____________ LINE NO. . . . . . [ ][ ] NAME_____________ LINE NO. . . . . . [ ][ ] NAME_____________ LINE NO. . . . . . [ ][ ] NAME_____________ LINE NO. . . . . . [ ][ ]	NAME_____________ LINE NO. . . . . . [ ][ ] NAME_____________ LINE NO. . . . . . [ ][ ] NAME_____________ LINE NO. . . . . . [ ][ ] NAME_____________ LINE NO. . . . . . [ ][ ]	NAME_____________ LINE NO. . . . . . [ ][ ] NAME_____________ LINE NO. . . . . . [ ][ ] NAME_____________ LINE NO. . . . . . [ ][ ] NAME_____________ LINE NO. . . . . . [ ][ ]
137		GO BACK TO 129 FOR NEXT NET; OR, IF NO MORE NETS, GO TO 138.	GO BACK TO 129 FOR NEXT NET; OR, IF NO MORE NETS, GO TO 138.	GO TO 129 IN FIRST COLUMN OF A NEW QUESTIONNAIRE; OR, IF NO MORE NETS, GO TO 138.

138	ASK RESPONDENT FOR A TEASPOONFUL OF COOKING SALT TEST SALT FOR IODINE RECORD PPM (PARTS PER MILLION)	0 PPM (NO IODINE).. 1 BELOW 15 PPM... 2 15 PPM AND ABOVE..................................... 3 NO SALT IN HH.. 4 SALT NOT TESTED________________________ 6 (SPECIFY REASON)

501	CHECK COLUMN 10. RECORD THE LINE NUMBER AND AGE FOR ALL ELIGIBLE CHILDREN 0-5 YEARS IN QUESTION 502. IF MORE THAN SIX CHILDREN, USE ADDITIONAL QUESTIONNAIRE. A FINAL OUTCOME MUST BE RECORDED FOR THE WEIGHT AND HEIGHT MEASUREMENT IN 508.			
		CHILD 1	CHILD 2	CHILD 3
502	LINE NUMBER FROM COLUMN 10 NAME FROM COLUMN 2	LINE NUMBER . . . NAME _____	LINE NUMBER . . . NAME _____	LINE NUMBER . . . NAME _____
503	IF MOTHER INTERVIEWED, COPY MONTH AND YEAR FROM BIRTH HISTORY AND ASK DAY; IF MOTHER NOT INTERVIEWED, ASK: What is (NAME'S) birth date?	DAY . . . . . . MONTH . . . . . YEAR	DAY . . . . . . MONTH . . . . . YEAR	DAY . . . . . . MONTH . . . . . YEAR
504	CHECK 503: CHILD BORN IN JANUARY 2003 OR LATER?	YES . . . . . 1 NO . . . . . 2 (GO TO 503 FOR NEXT CHILD OR, IF NO MORE, GO TO 515)	YES . . . . . 1 NO . . . . . 2 (GO TO 503 FOR NEXT CHILD OR, IF NO MORE, GO TO 515)	YES . . . . . 1 NO . . . . . 2 (GO TO 503 FOR NEXT CHILD OR, IF NO MORE, GO TO 515)
505	WEIGHT IN KILOGRAMS	KG.	KG.	KG. . . . .
506	HEIGHT IN CENTIMETERS	CM.	CM.	CM. . . . .
507	MEASURED LYING DOWN OR STANDING UP?	LYING DOWN . . . . . 1 STANDING UP 2	LYING DOWN . . . . . 1 STANDING UP 2	LYING DOWN . . . . . 1 STANDING UP 2
508	RESULT OF WEIGHT AND HEIGHT MEASUREMENT	MEASURED . . . . . 1 NOT PRESENT . . . . . 2 REFUSED . . . . . 3 OTHER 6	MEASURED . . . . . 1 NOT PRESENT . . . . . 2 REFUSED . . . . . 3 OTHER 6	MEASURED . . . . . 1 NOT PRESENT . . . . . 2 REFUSED . . . . . 3 OTHER 6
514		GO BACK TO 503 IN NEXT COLUMN IN THIS QUESTIONNAIRE OR IN THE FIRST COLUMN OF THE ADDITIONAL QUESTIONNAIRE(S); IF NO MORE CHILDREN, GO TO 515.		

		CHILD 4	CHILD 5	CHILD 6
502	LINE NUMBER FROM COLUMN 10 NAME FROM COLUMN 2	LINE NUMBER . . . NAME _____	LINE NUMBER . . . NAME _____	LINE NUMBER . . . NAME _____
503	IF MOTHER INTERVIEWED, COPY MONTH AND YEAR FROM BIRTH HISTORY AND ASK DAY; IF MOTHER NOT INTERVIEWED, ASK: What is (NAME'S) birth date?	DAY . . . . . . MONTH . . . . . YEAR	DAY . . . . . . MONTH . . . . . YEAR	DAY . . . . . . MONTH . . . . . YEAR
504	CHECK 503: CHILD BORN IN JANUARY 2003 OR LATER	YES . . . . . 1 NO . . . . . 2 (GO TO 503 FOR NEXT CHILD OR, IF NO MORE, GO TO 515)	YES . . . . . 1 NO . . . . . 2 (GO TO 503 FOR NEXT CHILD OR, IF NO MORE, GO TO 515)	YES . . . . . 1 NO . . . . . 2 (GO TO 503 FOR NEXT CHILD OR, IF NO MORE, GO TO 515)
505	WEIGHT IN KILOGRAMS	KG.	KG.	KG. . . . .
506	HEIGHT IN CENTIMETERS	CM.	CM.	CM. . . . .
507	MEASURED LYING DOWN OR STANDING UP?	LYING DOWN . . . . . 1 STANDING UP 2	LYING DOWN . . . . . 1 STANDING UP 2	LYING DOWN . . . . . 1 STANDING UP 2
508	RESULT OF WEIGHT AND HEIGHT MEASUREMENT	MEASURED . . . . . 1 NOT PRESENT . . . . . 2 REFUSED . . . . . 3 OTHER 6	MEASURED . . . . . 1 NOT PRESENT . . . . . 2 REFUSED . . . . . 3 OTHER 6	MEASURED . . . . . 1 NOT PRESENT . . . . . 2 REFUSED . . . . . 3 OTHER 6
514		GO BACK TO 503 IN NEXT COLUMN IN THIS QUESTIONNAIRE OR IN THE FIRST COLUMN OF ADDITIONAL QUESTIONNAIRE(S); IF NO MORE CHILDREN, GO TO 515.		

WEIGHT, HEIGHT AND HIV TESTING FOR WOMEN AGE 15-49

515 CHECK COLUMN 9. RECORD THE LINE NUMBER AND NAME FOR ALL ELIGIBLE WOMEN IN 516.
IF THERE ARE MORE THAN THREE WOMEN, USE ADDITIONAL QUESTIONNAIRE(S).

A FINAL OUTCOME MUST BE RECORDED FOR THE WEIGHT AND HEIGHT MEASUREMENT IN 519 AND FOR THE HIV TEST PROCEDURE IN 530.

		WOMAN 1	WOMAN 2	WOMAN 3
516	LINE NUMBER (COLUMN 9) NAME (COLUMN 2)	LINE NUMBER . . . . . . NAME _____	LINE NUMBER . . . . . . NAME _____	LINE NUMBER . . . . . . NAME _____
517	WEIGHT IN KILOGRAMS	KG.	KG.	KG. . . . .
518	HEIGHT IN CENTIMETERS	CM.	CM.	CM. . . . .
519	RESULT OF WEIGHT AND HEIGHT MEASUREMENT	MEASURED . . . . . 1 NOT PRESENT . . . . . 2 REFUSED . . . . . 3 OTHER 6	MEASURED . . . . . 1 NOT PRESENT . . . . . 2 REFUSED . . . . . 3 OTHER 6	MEASURED . . . . . 1 NOT PRESENT . . . . . 2 REFUSED . . . . . 3 OTHER 6
520	AGE: CHECK COLUMN 7.	15-17 YEARS . . . . . 1 18-49 YEARS . . . . . 2 (GO TO 525)	15-17 YEARS . . . . . 1 18-49 YEARS . . . . . 2 (GO TO 525)	15-17 YEARS . . . . . . 18-49 YEARS . . . . . . (GO TO 525)
521	MARITAL STATUS: CHECK COLUMN 8.	CODE 4 (NEVER IN UNION) . . . 1 OTHER . . . . . 2 (GO TO 525)	CODE 4 (NEVER IN UNION) . . . 1 OTHER . . . . . 2 (GO TO 525)	CODE 4 (NEVER IN UNION) . . . . . . OTHER . . . . . . (GO TO 525)
522	RECORD LINE NUMBER OF PARENT/OTHER ADULT RESPONSIBLE FOR ADOLESCENT. RECORD '00' IF NOT LISTED.	LINE NUMBER OF PARENT OR OTHER RESPONSIBLE ADULT .	LINE NUMBER OF PARENT OR OTHER RESPONSIBLE ADULT .	LINE NUMBER OF PARENT OR OTHER RESPONSIBLE ADULT .
525	READ THE HIV TEST CONSENT STATEMENT. FOR NEVER-IN-UNION WOMEN AGE 15-17, ASK CONSENT FROM PARENT/ OTHER ADULT IDENTIFIED IN 522 BEFORE ASKING RESPONDENT'S CONSENT.	GRANTED . . . . . 1 PARENT/OTHER RESPONSIBLE ADULT REFUSED . . . . . 2 RESPONDENT REFUSED . . . . . 3 _____ (SIGN)	GRANTED . . . . . 1 PARENT/OTHER RESPONSIBLE ADULT REFUSED . . . . . 2 RESPONDENT REFUSED . . . . . 3 _____ (SIGN)	GRANTED . . . . . 1 PARENT/OTHER RESPONSIBLE ADULT REFUSED . . . . . 2 RESPONDENT REFUSED . . . . . 3 _____ (SIGN)

CONSENT STATEMENT FOR HIV TEST

READ CONSENT STATEMENT TO EACH RESPONDENT. CIRCLE CODE '1' IN 525 IF RESPONDENT CONSENTS TO THE HIV TEST AND CODE '3' IF SHE REFUSES.

FOR NEVER-IN-UNION WOMEN AGE 15-17, ASK CONSENT FROM THE PARENT OR OTHER ADULT IDENTIFIED AS RESPONSIBLE FOR THE ADOLESCENT (SEE 522) BEFORE ASKING THE ADOLESCENT FOR HER CONSENT. CIRCLE CODE '2' IN 525 IF THE PARENT (OTHER ADULT) REFUSES. CONDUCT THE TEST ONLY IF BOTH THE PARENT (OTHER ADULT) AND THE ADOLESCENT CONSENT.

As part of the survey we also are asking people all over the country to take an HIV test. HIV is the virus that causes AIDS. AIDS is a very serious illness. The HIV test is being done to see how big the AIDS problem is in Kenya.

For the HIV test, we need a few drops of blood from a finger. The equipment used in taking the blood is clean and completely safe. It has never been used before and will be thrown away after each test.

No names will be attached so we will not be able to tell you the test results. No one else will be able to know (your/NAME OF ADOLESCENT's) test results either.

If you want to know whether you have HIV, I can provide you with a list of nearby facilities offering counseling and testing for HIV. I will also give you a voucher for free services for you (and for your partner if you want) that you can use at any of these facilities.

Do you have any questions?

You can say yes to the test, or you can say no. It is up to you to decide.
Will you allow (NAME OF ADOLESCENT to) take the HIV test?

		WOMAN 1	WOMAN 2	WOMAN 3
	LINE NUMBER (COLUMN 9) NAME (COLUMN 2)	LINE NUMBER . . . . . ☐☐ NAME _____	LINE NUMBER . . . . . ☐☐ NAME _____	LINE NUMBER . . . . . ☐☐ NAME _____
526	CHECK 525 AND PREPARE EQUIPMENT AND SUPPLIES FOR THE HIV TEST IF CONSENT HAS BEEN OBTAINED AND PROCEED WITH THE TEST. A FINAL OUTCOME FOR THE THE HIV TEST PROCEDURE MUST BE RECORDED IN 530 FOR EACH ELIGIBLE WOMAN EVEN IF SHE WAS NOT PRESENT, REFUSED, OR COULD NOT BE TESTED FOR SOME OTHER REASON.			
529	BAR CODE LABEL	PUT THE 1ST BAR CODE LABEL HERE. PUT THE 2ND BAR CODE LABEL ON THE RESPONDENT'S FILTER PAPER AND THE 3RD ON THE TRANSMITTAL FORM.	PUT THE 1ST BAR CODE LABEL HERE. PUT THE 2ND BAR CODE LABEL ON THE RESPONDENT'S FILTER PAPER AND THE 3RD ON THE TRANSMITTAL FORM.	PUT THE 1ST BAR CODE LABEL HERE. PUT THE 2ND BAR CODE LABEL ON THE RESPONDENT'S FILTER PAPER AND THE 3RD ON THE TRANSMITTAL FORM.
530	OUTCOME OF HIV TEST PROCEDURE	BLOOD TAKEN . . . . . 1 NOT PRESENT . . . . . 2 REFUSED . . . . . 3 OTHER 6	BLOOD TAKEN . . . . . 1 NOT PRESENT . . . . . 2 REFUSED . . . . . 3 OTHER 6	BLOOD TAKEN . . . . . 1 NOT PRESENT . . . . . 2 REFUSED . . . . . 3 OTHER 6
530A	CHECK 530: OUTCOME OF HIV TEST	BLOOD TAKEN → GO TO NEXT WOMAN BLOOD NOT TAKEN → GO TO NEXT WOMAN	BLOOD TAKEN → GO TO NEXT WOMAN BLOOD NOT TAKEN → GO TO NEXT WOMAN	BLOOD TAKEN → GO TO NEXT WOMAN BLOOD NOT TAKEN → GO TO NEXT WOMAN
530B	READ THE CONSENT STATEMENT FOR ADDITIONAL TESTS. FOR NEVER-IN UNION WOMEN AGE 15-17, ASK CONSENT FROM PARENT/ OTHER ADULT IDENTIFIED IN 522 BEFORE ASKING RESPONDENT'S CONSENT.	GRANTED . . . . . 1 PARENT/OTHER RESPONSIBLE ADULT REFUSED . . . . . 2 RESPONDENT REFUSED . . . . . 3 _____ (SIGN)	GRANTED . . . . . 1 PARENT/OTHER RESPONSIBLE ADULT REFUSED . . . . . 2 RESPONDENT REFUSED . . . . . 3 _____ (SIGN)	GRANTED . . . . . 1 PARENT/OTHER RESPONSIBLE ADULT REFUSED . . . . . 2 RESPONDENT REFUSED . . . . . 3 _____ (SIGN)
530C	ADDITIONAL TESTS	CHECK 530B: IF CONSENT HAS NOT BEEN GRANTED WRITE "NO ADDITIONAL TEST" ON THE FILTER PAPER.	CHECK 530B: IF CONSENT HAS NOT BEEN GRANTED WRITE "NO ADDITIONAL TEST" ON THE FILTER PAPER.	CHECK 530B: IF CONSENT HAS NOT BEEN GRANTED WRITE "NO ADDITIONAL TEST" ON THE FILTER PAPER.
530D	GO BACK TO 517 IN NEXT COLUMN IN THIS QUESTIONNAIRE OR IN THE FIRST COLUMNS OF ADDITIONAL QUESTIONNAIRE(S); IF NO MORE WOMEN, GO TO 531.			

CONSENT STATEMENT FOR ADDITIONAL TESTS

READ CONSENT STATEMENT TO EACH RESPONDENT. CIRCLE CODE '1' IN 530B IF RESPONDENT CONSENTS TO THE ADDITIONAL TESTS AND CODE '3' IF SHE REFUSES.

FOR NEVER-IN-UNION WOMEN AGE 15-17, ASK CONSENT FROM THE PARENT OR OTHER ADULT IDENTIFIED AS RESPONSIBLE FOR THE ADOLESCENT (SEE 522) BEFORE ASKING THE ADOLESCENT FOR HER CONSENT. CIRCLE CODE '2' IN 530B IF THE PARENT (OTHER ADULT) REFUSES. CIRCLE CODE '1' IN 530B IF BOTH THE PARENT (OTHER ADULT) AND THE ADOLESCENT CONSENT.

We ask you to allow Kenya National Bureau of Statistics to store part of the blood sample at the laboratory to be used for testing or research in the future. We are not certain about what tests might be done.

The blood sample will not have any name or other data attached that could identify (you/NAME OF ADOLESCENT). You do not have to agree. If you do not want the blood sample stored for later use, (you/NAME OF ADOLESCENT) can still participate in the HIV testing in this survey. Will you allow us to keep the blood sample stored for later testing or research?

HIV TESTING FOR MEN AGE 15-54

531	CHECK COLUMN 11. RECORD THE LINE NUMBER AND NAME FOR ALL ELIGIBLE MEN IN 532. IF THERE ARE MORE THAN THREE MEN, USE ADDITIONAL QUESTIONNAIRE(S). A FINAL OUTCOME MUST BE RECORDED FOR THE HIV TEST PROCEDURE IN 545.			
		MAN 1	MAN 2	MAN 3
532	LINE NUMBER (COLUMN 11) NAME (COLUMN 2)	LINE NUMBER . . . . . [ ][ ] NAME _____	LINE NUMBER . . . . . [ ][ ] NAME _____	LINE NUMBER . . . . . [ ][ ] NAME _____
536	AGE: CHECK COLUMN 7.	15-17 YEARS . . . . . 1 18-54 YEARS . . . . . 2 (GO TO 540) ↵	15-17 YEARS . . . . . 1 18-54 YEARS . . . . . 2 (GO TO 540) ↵	15-17 YEARS . . . . . . 18-54 YEARS . . . . . . (GO TO 540) ↵
537	MARITAL STATUS: CHECK COLUMN 8.	CODE 4 (NEVER IN UNION) . . . . . 1 OTHER . . . . . 2 (GO TO 540) ↵	CODE 4 (NEVER IN UNION) . . . . . 1 OTHER . . . . . 2 (GO TO 540) ↵	CODE 4 (NEVER IN UNION) . . . . . . OTHER . . . . . . (GO TO 540) ↵
538	RECORD LINE NUMBER OF PARENT/OTHER ADULT RESPONSIBLE FOR ADOLESCENT. RECORD '00' IF NOT LISTED.	LINE NUMBER OF PARENT OR OTHER RESPONSIBLE ADULT . [ ][ ]	LINE NUMBER OF PARENT OR OTHER RESPONSIBLE ADULT . [ ][ ]	LINE NUMBER OF PARENT OR OTHER RESPONSIBLE ADULT . [ ][ ]
540	READ THE HIV TEST CONSENT STATEMENT. FOR NEVER-IN-UNION MEN AGE 15-17, ASK CONSENT FROM PARENT/ OTHER ADULT IDENTIFIED IN 538 BEFORE ASKING RESPONDENT'S CONSENT.	GRANTED . . . . . 1 PARENT/OTHER RESPONSIBLE ADULT REFUSED . . . . . 2 RESPONDENT REFUSED . . . . . 3 _____ (SIGN)	GRANTED . . . . . 1 PARENT/OTHER RESPONSIBLE ADULT REFUSED . . . . . 2 RESPONDENT REFUSED . . . . . 3 _____ (SIGN)	GRANTED . . . . . 1 PARENT/OTHER RESPONSIBLE ADULT REFUSED . . . . . 2 RESPONDENT REFUSED . . . . . 3 _____ (SIGN)
541	CHECK 540 AND PREPARE EQUIPMENT AND SUPPLIES FOR THE HIV TEST IFCONSENT HAS BEEN OBTAINED AND PROCEED WITH THE TEST. A FINAL OUTCOME OF THE HIV TEST PROCEDURE MUST BE RECORDED IN 545 FOR EACH ELIGIBLE MAN EVEN IF HE WAS NOT PRESENT, REFUSED, OR COULD NOT BE TESTED FOR SOME OTHER REASON.			
544	BAR CODE LABEL	PUT THE 1ST BAR CODE LABEL HERE. PUT THE 2ND BAR CODE LABEL ON THE RESPONDENT'S FILTER PAPER AND THE 3RD ON THE TRANSMITTAL FORM.	PUT THE 1ST BAR CODE LABEL HERE. PUT THE 2ND BAR CODE LABEL ON THE RESPONDENT'S FILTER PAPER AND THE 3RD ON THE TRANSMITTAL FORM.	PUT THE 1ST BAR CODE LABEL HERE. PUT THE 2ND BAR CODE LABEL ON THE RESPONDENT'S FILTER PAPER AND THE 3RD ON THE TRANSMITTAL FORM.

CONSENT STATEMENT FOR HIV TEST

READ CONSENT STATEMENT TO EACH RESPONDENT. CIRCLE CODE '1' IN 540 IF RESPONDENT CONSENTS TO THE HIV TEST AND CODE '3' IF HE REFUSES.

FOR NEVER-IN-UNION MEN AGE 15-17, ASK CONSENT FROM THE PARENT OR OTHER ADULT IDENTIFIED AS RESPONSIBLE FOR THE ADOLESCENT (SEE 538) BEFORE ASKING THE ADOLESCENT FOR HIS CONSENT. CIRCLE CODE '2' IN 540 IF THE PARENT (OTHER ADULT) REFUSES. CONDUCT THE TEST ONLY IF BOTH THE PARENT (OTHER ADULT) AND THE ADOLESCENT CONSENT.

As part of the survey we also are asking people all over the country to take an HIV test. HIV is the virus that causes AIDS. AIDS is a very serious illness. The HIV test is being done to see how big the AIDS problem is in Kenya.

For the HIV test, we need a few drops of blood from a finger. The equipment used in taking the blood is clean and completely safe. It has never been used before and will be thrown away after each test.

No names will be attached so we will not be able to tell you the test results. No one else will be able to know (your/NAME OF ADOLESCENT's) test results either.

If you want to know whether you have HIV, I can provide you with a list of nearby facilities offering counseling and testing for HIV. I will also give you a voucher for free services for you (and for your partner if you want) that you can use at any of these facilities.

Do you have any questions?

You can say yes to the test, or you can say no. It is up to you to decide.
Will you allow (NAME OF ADOLESCENT to) take the HIV test?

		MAN 1	MAN 2	MAN 3
	LINE NUMBER (COLUMN 11) NAME (COLUMN 2)	LINE NUMBER . . . . . [ ][ ] NAME _____	LINE NUMBER . . . . . [ ][ ] NAME _____	LINE NUMBER . . . . . [ ][ ] NAME _____
545	OUTCOME OF HIV TEST PROCEDURE	BLOOD TAKEN . . . . . 1 NOT PRESENT . . . . . 2 REFUSED . . . . . 3 OTHER 6	BLOOD TAKEN . . . . . 1 NOT PRESENT . . . . . 2 REFUSED . . . . . 3 OTHER 6	BLOOD TAKEN . . . . . 1 NOT PRESENT . . . . . 2 REFUSED . . . . . 3 OTHER 6
545A	CHECK 545 OUTCOME OF HIV TEST	BLOOD TAKEN → BLOOD NOT TAKEN → GO TO NEXT MAN	BLOOD TAKEN → BLOOD NOT TAKEN → GO TO NEXT MAN	BLOOD TAKEN → BLOOD NOT TAKEN → GO TO NEXT MAN
545B	READ THE CONSENT STATEMENT FOR ADDITIONAL TESTS WITH LEFT OVER BLOOD. FOR NEVER-IN-UNION MEN AGE 15-17, ASK CONSENT FROM PARENT/ OTHER ADULT IDENTIFIED IN 538 BEFORE ASKING RESPONDENT'S CONSENT.	GRANTED . . . . . 1 PARENT/OTHER RESPONSIBLE ADULT REFUSED . . . . . 2 RESPONDENT REFUSED . . . . . 3 _____ (SIGN)	GRANTED . . . . . 1 PARENT/OTHER RESPONSIBLE ADULT REFUSED . . . . . 2 RESPONDENT REFUSED . . . . . 3 _____ (SIGN)	GRANTED . . . . . 1 PARENT/OTHER RESPONSIBLE ADULT REFUSED . . . . . 2 RESPONDENT REFUSED . . . . . 3 _____ (SIGN)
545C	ADDITIONAL TESTS	CHECK 545B: IF CONSENT HAS NOT BEEN GRANTED WRITE "NO ADDITIONAL TEST" ON THE FILTER PAPER.	CHECK 545B: IF CONSENT HAS NOT BEEN GRANTED WRITE "NO ADDITIONAL TEST" ON THE FILTER PAPER.	CHECK 545B: IF CONSENT HAS NOT BEEN GRANTED WRITE "NO ADDITIONAL TEST" ON THE FILTER PAPER.
545D	GO BACK TO 536 IN NEXT COLUMN IN THIS QUESTIONNAIRE OR IN THE FIRST COLUMNS OF ADDITIONAL QUESTIONNAIRE(S); IF NO MORE MEN, END INTERVIEW.			

CONSENT STATEMENT FOR ADDITIONAL TESTS

READ CONSENT STATEMENT TO EACH RESPONDENT. CIRCLE CODE '1' IN 545B IF RESPONDENT CONSENTS TO THE ADDITIONAL TESTS AND CODE '3' IF HE REFUSES.

FOR NEVER-IN-UNION MEN AGE 15-17, ASK CONSENT FROM THE PARENT OR OTHER ADULT IDENTIFIED AS RESPONSIBLE FOR THE ADOLESCENT (SEE 538) BEFORE ASKING THE ADOLESCENT FOR HIS CONSENT. CIRCLE CODE '2' IN 545B IF THE PARENT (OTHER ADULT) REFUSES. CIRCLE CODE '1' IN 545B ONLY IF BOTH THE PARENT (OTHER ADULT) AND THE ADOLESCENT CONSENT.

We ask you to allow Kenya National Bureau of Statistics to store part of the blood sample at the laboratory to be used for testing or research in the future. We are not certain about what tests might be done.

The blood sample will not have any name or other data attached that could identify (you/NAME OF ADOLESCENT). You do not have to agree. If you do not want the blood sample stored for later use, (you/NAME OF ADOLESCENT) can still participate in the HIV testing in this survey. Will you allow us to keep the blood sample stored for later testing or research?

SECTION 13. FEMALE GENITAL CUTTING

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
1301	Have you ever heard of female circumcision?	YES . . . . . 1 NO 2	→ 1303
1302	In some countries, there is a practice in which a girl may have part of her genitals cut. Have you ever heard about this practice?	YES . . . . . 1 NO 2	→ 1322
1303	Have you yourself ever been circumcised?	YES . . . . . 1 NO 2	→ 1309A
1304	Now I would like to ask you what was done to you at that time. Was any flesh removed from the genital area?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	→ 1306
1305	Was the genital area just nicked without removing any flesh?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	
1306	Was your genital area sewn closed?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	
1307	How old were you when you were circumcised? IF THE RESPONDENT DOES NOT KNOW THE EXACT AGE, PROBE TO GET AN ESTIMATE.	AGE IN COMPLETED YEARS .. ☐☐ DURING INFANCY . . . . . 95 DON'T KNOW 98	
1308	Who performed the circumcision?	**TRADITIONAL** TRAD. CIRCUMCISER . . . . . 11 TRAD. BIRTH ATTENDANT . . . . . 12 OTHER TRAD. _____ 16 (SPECIFY) **HEALTH PROFESSIONAL** DOCTOR . . . . . 21 TRAINED NURSE/MIDWIFE . . . . . 22 OTHER HEALTH PROFESSIONAL _____ 26 (SPECIFY) DON'T KNOW 98	
1309A	CHECK 214 AND 216: NUMBER OF LIVING DAUGHTERS . . . . . ☐☐		
1309B	CHECK 1309A: HAS ONE LIVING DAUGHTER ☐↓ HAS MORE THAN ONE LIVING DAUGHTER ☐↓ HAS NO LIVING DAUGHTER ☐		→ 1319
1310	CHECK 1309B: ONE LIVING DAUGHTER ☐↓ Has your daughter been circumcised? IF YES: RECORD '01' MORE THAN ONE LIVING DAUGHTER ☐↓ Have any of your daughters been circumcised? IF YES: How many?	NUMBER CIRCUMCISED . . . . . ☐☐ NO DAUGHTER CIRCUMCISED 00	→ 1318
1311	CHECK 1310: ONE LIVING DAUGHTER ☐↓ What is your daughter's name? MORE THAN ONE LIVING DAUGHTER ☐↓ Which of your daughters was circumcised most recently? _____ (DAUGHTER'S NAME)	DAUGHTER'S LINE NUMBER FROM Q. 212 . . . . . ☐☐	

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
1312	Now I would like to ask you what was done to (NAME OF THE DAUGHTER FROM Q. 1311) at that time. Was any flesh removed from her genital area?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	→ 1314
1313	Was her genital area just nicked without removing any flesh?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	
1314	Was her genital area sewn closed?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	
1315	How old was (NAME OF THE DAUGHTER FROM Q. 1311) when this occurred? IF THE RESPONDENT DOES NOT KNOW THE AGE, PROBE TO GET AN ESTIMATE.	AGE IN COMPLETED YEARS . ☐☐ DURING INFANCY . . . . . 95 DON'T KNOW 98	
1316	Who performed the circumcision?	**TRADITIONAL** TRAD. CIRCUMCISER . . . . . 11 TRAD. BIRTH ATTENDANT . . . . . 12 OTHER TRAD. _____ 16 (SPECIFY) **HEALTH PROFESSIONAL** DOCTOR . . . . . 21 TRAINED NURSE/MIDWIFE . . . . . 22 OTHER HEALTH PROFESSIONAL _____ 26 (SPECIFY) DON'T KNOW 98	
1317	CHECK 1309A AND 1310: 1309A IS HIGHER THAN 1310 ☐ ↓ 1309A = 1310 ☐ →		1319
1318	Do you intend to have [your (other) daughter/any of your (other) daughters] circumcised?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	
1319	What benefits do girls themselves get if they are circumcised? PROBE: Any other benefits? RECORD ALL MENTIONED.	CLEANLINESS/HYGIENE . . . . . A SOCIAL ACCEPTANCE . . . . . B BETTER MARRIAGE PROSPECTS . . C PRESERVE VIRGINITY/PREVENT PREMARITAL SEX . . . . . D MORE SEXUAL PLEASURE FOR THE MAN . . . . . E RELIGIOUS APPROVAL . . . . . F OTHER _____ X (SPECIFY) NO BENEFITS . . . . . Y	
1320	Do you believe that this practice is required by your religion?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	
1321	Do you think that this practice should be continued, or should it be stopped?	CONTINUED . . . . . 1 STOPPED . . . . . 2 DEPENDS . . . . . 3 DON'T KNOW 8	
1322	RECORD THE TIME.	HOUR . . . . . ☐☐ MINUTES . . . . . ☐☐	

INTERVIEWER'S OBSERVATIONS

TO BE FILLED IN AFTER COMPLETING INTERVIEW

COMMENTS ABOUT RESPONDENT:

COMMENTS ON SPECIFIC QUESTIONS:

ANY OTHER COMMENTS:

SUPERVISOR'S OBSERVATIONS

NAME OF SUPERVISOR: _____ DATE: _____

EDITOR'S OBSERVATIONS

NAME OF EDITOR: _____ DATE: _____

INSTRUCTIONS:
ONLY ONE CODE SHOULD APPEAR IN ANY BOX.
ALL MONTHS SHOULD BE FILLED IN.

INFORMATION TO BE CODED FOR EACH COLUMN

BIRTHS, PREGNANCIES, CONTRACEPTIVE USE

B BIRTHS
P PREGNANCIES
T TERMINATIONS

0 NO METHOD
1 FEMALE STERILIZATION
2 MALE STERILIZATION
3 PILL
4 IUD
5 INJECTABLES
6 IMPLANTS
7 CONDOM
8 FEMALE CONDOM
9 RHYTHM METHOD
J WITHDRAWAL
K LACTATIONAL AMENORRHEA METHOD

X OTHER _____
(SPECIFY)

2	04	APR	01		2
0	03	MAR	02		0
0	02	FEB	03		0
9	01	JAN	04		9
	12	DEC	05		
	11	NOV	06		
	10	OCT	07		
	09	SEP	08		
2	08	AUG	09		2
0	07	JUL	10		0
0	06	JUN	11		0
8	05	MAY	12		8
	04	APR	13		
	03	MAR	14		
	02	FEB	15		
	01	JAN	16		
	12	DEC	17		
	11	NOV	18		
	10	OCT	19		
	09	SEP	20		
2	08	AUG	21		2
0	07	JUL	22		0
0	06	JUN	23		0
7	05	MAY	24		7
	04	APR	25		
	03	MAR	26		
	02	FEB	27		
	01	JAN	28		
	12	DEC	29		
	11	NOV	30		
	10	OCT	31		
	09	SEP	32		
2	08	AUG	33		2
0	07	JUL	34		0
0	06	JUN	35		0
6	05	MAY	36		6
	04	APR	37		
	03	MAR	38		
	02	FEB	39		
	01	JAN	40		
	12	DEC	41		
	11	NOV	42		
	10	OCT	43		
	09	SEP	44		
2	08	AUG	45		2
0	07	JUL	46		0
0	06	JUN	47		0
5	05	MAY	48		5
	04	APR	49		
	03	MAR	50		
	02	FEB	51		
	01	JAN	52		
	12	DEC	53		
	11	NOV	54		
	10	OCT	55		
	09	SEP	56		
2	08	AUG	57		2
0	07	JUL	58		0
0	06	JUN	59		0
4	05	MAY	60		4
	04	APR	61		
	03	MAR	62		
	02	FEB	63		
	01	JAN	64		
	12	DEC	65		
	11	NOV	66		
	10	OCT	67		
	09	SEP	68		
2	08	AUG	69		2
0	07	JUL	70		0
0	06	JUN	71		0
3	05	MAY	72		3
	04	APR	73		
	03	MAR	74		
	02	FEB	75		
	01	JAN	76		

SECTION 8. OTHER HEALTH ISSUES

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
801	Have you ever heard of an illness called tuberculosis or TB?	YES . . . . . 1 NO 2	→ 805
802	How does tuberculosis spread from one person to another? PROBE: Any other ways? RECORD ALL MENTIONED.	THROUGH THE AIR WHEN COUGHING OR SNEEZING . . . . . A THROUGH SHARING UTENSILS . . . . . B THROUGH TOUCHING A PERSON WITH TB . . . . . C THROUGH FOOD . . . . . D THROUGH SEXUAL CONTACT . . . . . E THROUGH MOSQUITO BITES . . . . . F OTHER _____ X (SPECIFY) DON'T KNOW . . . . . Z	
803	Can tuberculosis be cured?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	
804	If a member of your family got tuberculosis, would you want it to remain a secret or not?	YES, REMAIN A SECRET . . . . . 1 NO . . . . . 2 DON'T KNOW/NOT SURE/ DEPENDS 8	
805	Some men are circumcised. Are you circumcised?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	
810	Do you currently smoke cigarettes?	YES . . . . . 1 NO 2	→ 812
811	In the last 24 hours, how many cigarettes did you smoke?	CIGARETTES	
812	Do you currently smoke or use any other type of tobacco?	YES . . . . . 1 NO 2	→ 814
813	What (other) type of tobacco do you currently smoke or use? RECORD ALL MENTIONED.	PIPE . . . . . A CHEWING TOBACCO . . . . . B SNUFF . . . . . C OTHER _____ X (SPECIFY)	
814	Are you covered by any health insurance?	YES . . . . . 1 NO 2	→ 820
815	What type of health insurance? RECORD ALL MENTIONED.	MUTUAL HEALTH ORGANIZATION/ COMMUNITY BASED HEALTH INSURANCE . . . . . A HEALTH INSURANCE THROUGH EMPLOYER . . . . . B SOCIAL SECURITY . . . . . C OTHER PRIVATELY PURCHASED COMMERCIAL HEALTH INSURANCE. D OTHER _____ X (SPECIFY)	
820	RECORD THE TIME.	HOUR . . . . . MINUTES	

INTERVIEWER'S OBSERVATIONS

TO BE FILLED IN AFTER COMPLETING INTERVIEW

COMMENTS ABOUT RESPONDENT:

COMMENTS ON SPECIFIC QUESTIONS:

ANY OTHER COMMENTS:

SUPERVISOR'S OBSERVATIONS

NAME OF SUPERVISOR: _____ DATE: _____

EDITOR'S OBSERVATIONS

NAME OF EDITOR: _____ DATE: _____

Doctoral Theses at The Faculty of Psychology, University of Bergen

1980	Allen, H.M., Dr. philos.	Parent-offspring interactions in willow grouse (Lagopus L. Lagopus).
1981	Myhrer, T., Dr. philos.	Behavioral Studies after selective disruption of hippocampal inputs in albino rats.
1982	Svebak, S., Dr. philos.	The significance of motivation for task-induced tonic physiological changes.
1983	Myhre, G., Dr. philos.	The Biopsychology of behavior in captive Willow ptarmigan.
	Eide, R., Dr. philos.	PSYCHOSOCIAL FACTORS AND INDICES OF HEALTH RISKS. The relationship of psychosocial conditions to subjective complaints, arterial blood pressure, serum cholesterol, serum triglycerides and urinary catecholamines in middle aged populations in Western Norway.
	Værnes, R.J., Dr. philos.	Neuropsychological effects of diving.
1984	Kolstad, A., Dr. philos.	Til diskusjonen om sammenhengen mellom sosiale forhold og psykiske strukturer. En epidemiologisk undersøkelse blant barn og unge.
	Løberg, T., Dr. philos.	Neuropsychological assessment in alcohol dependence.
1985	Hellesnes, T., Dr. philos.	Læring og problemløsning. En studie av den perseptuelle analysens betydning for verbal læring.
	Håland, W., Dr. philos.	Psykoterapi: relasjon, utviklingsprosess og effekt.
1986	Hagtvet, K.A., Dr. philos.	The construct of test anxiety: Conceptual and methodological issues.
	Jellestad, F.K., Dr. philos.	Effects of neuron specific amygdala lesions on fear-motivated behavior in rats.
1987	Aarø, L.E., Dr. philos.	Health behaviour and sosioeconomic Status. A survey among the adult population in Norway.
	Underlid, K., Dr. philos.	Arbeidsløyse i psykososialt perspektiv.
	Laberg, J.C., Dr. philos.	Expectancy and classical conditioning in alcoholics' craving.
	Vollmer, F.C., Dr. philos.	Essays on explanation in psychology.
	Ellertsen, B., Dr. philos.	Migraine and tension headache: Psychophysiology, personality and therapy.
1988	Kaufmann, A., Dr. philos.	Antisosial atferd hos ungdom. En studie av psykologiske determinanter.

	Mykletun, R.J., Dr. philos.	Teacher stress: personality, work-load and health.
	Havik, O.E., Dr. philos.	After the myocardial infarction: A medical and psychological study with special emphasis on perceived illness.
1989	Bråten, S., Dr. philos.	Menneskedyaden. En teoretisk tese om sinnets dialogiske natur med informasjons- og utviklingspsykologiske implikasjoner sammenholdt med utvalgte spedbarnsstudier.
	Wold, B., Dr. psychol.	Lifestyles and physical activity. A theoretical and empirical analysis of socialization among children and adolescents.
1990	Flaten, M.A., Dr. psychol.	The role of habituation and learning in reflex modification.
1991	Alsaker, F.D., Dr. philos.	Global negative self-evaluations in early adolescence.
	Kraft, P., Dr. philos.	AIDS prevention in Norway. Empirical studies on diffusion of knowledge, public opinion, and sexual behaviour.
	Endresen, I.M., Dr. philos.	Psychoimmuniological stress markers in working life.
	Faleide, A.O., Dr. philos.	Asthma and allergy in childhood. Psychosocial and psychotherapeutic problems.
1992	Dalen, K., Dr. philos.	Hemispheric asymmetry and the Dual-Task Paradigm: An experimental approach.
	Bø, I.B., Dr. philos.	Ungdoms sosiale økologi. En undersøkelse av 14-16 åringers sosiale nettverk.
	Nivison, M.E., Dr. philos.	The relationship between noise as an experimental and environmental stressor, physiological changes and psychological factors.
	Torgersen, A.M., Dr. philos.	Genetic and environmental influence on temperamental behaviour. A longitudinal study of twins from infancy to adolescence.
1993	Larsen, S., Dr. philos.	Cultural background and problem drinking.
	Nordhus, I.H., Dr. philos.	Family caregiving. A community psychological study with special emphasis on clinical interventions.
	Thuen, F., Dr. psychol.	Accident-related behaviour among children and young adolescents: Prediction and prevention.
	Solheim, R., Dr. philos.	Spesifikke lærevansker. Diskrepanskriteriet anvendt i seleksjonsmetodikk.
	Johnsen, B.H., Dr. psychol.	Brain assymetry and facial emotional expressions: Conditioning experiments.
1994	Tønnessen, F.E., Dr. philos.	The etiology of Dyslexia.
	Kvale, G., Dr. psychol.	Psychological factors in anticipatory nausea and vomiting in cancer chemotherapy.

	Asbjørnsen, A.E., Dr. psychol.	Structural and dynamic factors in dichotic listening: An interactional model.
	Bru, E., Dr. philos.	The role of psychological factors in neck, shoulder and low back pain among female hospitale staff.
	Braathen, E.T., Dr. psychol.	Prediction of exellence and discontinuation in different types of sport: The significance of motivation and EMG.
	Johannessen, B.F., Dr. philos.	Det flytende kjønnet. Om lederskap, politikk og identitet.
1995	Sam, D.L., Dr. psychol.	Acculturation of young immigrants in Norway: A psychological and socio-cultural adaptation.
	Bjaalid, I.-K., Dr. philos	Component processes in word recognition.
	Martinsen, Ø., Dr. philos.	Cognitive style and insight.
	Nordby, H., Dr. philos.	Processing of auditory deviant events: Mismatch negativity of event-related brain potentials.
	Raaheim, A., Dr. philos.	Health perception and health behaviour, theoretical considerations, empirical studies, and practical implications.
	Seltzer, W.J., Dr.philos.	Studies of Psychocultural Approach to Families in Therapy.
	Brun, W., Dr.philos.	Subjective conceptions of uncertainty and risk.
	Aas, H.N., Dr. psychol.	Alcohol expectancies and socialization: Adolescents learning to drink.
	Bjørkly, S., Dr. psychol.	Diagnosis and prediction of intra-institutional aggressive behaviour in psychotic patients
1996	Anderssen, N., Dr. psychol.	Physical activity of young people in a health perspective: Stability, change and social influences.
	Sandal, Gro Mjeldheim, Dr. psychol.	Coping in extreme environments: The role of personality.
	Strumse, Einar, Dr. philos.	The psychology of aesthetics: explaining visual preferences for agrarian landscapes in Western Norway.
	Hestad, Knut, Dr. philos.	Neuropsychological deficits in HIV-1 infection.
	Lugoe, L.Wycliffe, Dr. philos.	Prediction of Tanzanian students' HIV risk and preventive behaviours
	Sandvik, B. Gunnhild, Dr. philos.	Fra distriktsjordmor til institusjonsjordmor. Fremveksten av en profesjon og en profesjonsutdanning
	Lie, Gro Therese, Dr. psychol.	The disease that dares not speak its name: Studies on factors of importance for coping with HIV/AIDS in Northern Tanzania
	Øygard, Lisbet, Dr. philos.	Health behaviors among young adults. A psychological and sociological approach
	Stormark, Kjell Morten, Dr. psychol.	Emotional modulation of selective attention: Experimental and clinical evidence.

	Einarsen, Ståle, Dr. psychol.	Bullying and harassment at work: epidemiological and psychosocial aspects.
1997	Knivsberg, Ann-Mari, Dr. philos.	Behavioural abnormalities and childhood psychopathology: Urinary peptide patterns as a potential tool in diagnosis and remediation.
	Eide, Arne H., Dr. philos.	Adolescent drug use in Zimbabwe. Cultural orientation in a global-local perspective and use of psychoactive substances among secondary school students.
	Sørensen, Marit, Dr. philos.	The psychology of initiating and maintaining exercise and diet behaviour.
	Skjæveland, Oddvar, Dr. psychol.	Relationships between spatial-physical neighborhood attributes and social relations among neighbors.
	Zewdie, Teka, Dr. philos.	Mother-child relational patterns in Ethiopia. Issues of developmental theories and intervention programs.
	Wilhelmsen, Britt Unni, Dr. philos.	Development and evaluation of two educational programmes designed to prevent alcohol use among adolescents.
	Manger, Terje, Dr. philos.	Gender differences in mathematical achievement among Norwegian elementary school students.
1998		
V	Lindstrøm, Torill Christine, Dr. philos.	«Good Grief»: Adapting to Bereavement.
	Skogstad, Anders, Dr. philos.	Effects of leadership behaviour on job satisfaction, health and efficiency.
	Haldorsen, Ellen M. Håland, Dr. psychol.	Return to work in low back pain patients.
	Besemer, Susan P., Dr. philos.	Creative Product Analysis: The Search for a Valid Model for Understanding Creativity in Products.
H	Winje, Dagfinn, Dr. psychol.	Psychological adjustment after severe trauma. A longitudinal study of adults' and children's posttraumatic reactions and coping after the bus accident in Måbødalen, Norway 1988.
	Vosburg, Suzanne K., Dr. philos.	The effects of mood on creative problem solving.
	Eriksen, Hege R., Dr. philos.	Stress and coping: Does it really matter for subjective health complaints?
	Jakobsen, Reidar, Dr. psychol.	Empiriske studier av kunnskap og holdninger om hiv/aids og den normative seksuelle utvikling i ungdomsårene.
1999		
V	Mikkelsen, Aslaug, Dr. philos.	Effects of learning opportunities and learning climate on occupational health.
	Samdal, Oddrun, Dr. philos.	The school environment as a risk or resource for students' health-related behaviours and subjective well-being.
	Friestad, Christine, Dr. philos.	Social psychological approaches to smoking.

	Ekeland, Tor-Johan, Dr. philos.	Meining som medisin. Ein analyse av placebofenomenet og implikasjoner for terapi og terapeutiske teoriar.
H	Saban, Sara, Dr. psychol.	Brain Asymmetry and Attention: Classical Conditioning Experiments.
	Carlsten, Carl Thomas, Dr. philos.	God lesing – God læring. En aksjonsrettet studie av undervisning i fagtekstlesing.
	Dundas, Ingrid, Dr. psychol.	Functional and dysfunctional closeness. Family interaction and children's adjustment.
	Engen, Liv, Dr. philos.	Kartlegging av leseferdighet på småskoletrinnet og vurdering av faktorer som kan være av betydning for optimal leseutvikling.
2000		
V	Hovland, Ole Johan, Dr. philos.	Transforming a self-preserving "alarm" reaction into a self-defeating emotional response: Toward an integrative approach to anxiety as a human phenomenon.
	Lillejord, Sølvi, Dr. philos.	Handlingsrasjonalitet og spesialundervisning. En analyse av aktørperspektiver.
	Sandell, Ove, Dr. philos.	Den varme kunnskapen.
	Oftedal, Marit Petersen, Dr. philos.	Diagnostisering av ordavkodingsvansker: En prosessanalytisk tilnærmingsmåte.
H	Sandbak, Tone, Dr. psychol.	Alcohol consumption and preference in the rat: The significance of individual differences and relationships to stress pathology
	Eid, Jarle, Dr. psychol.	Early predictors of PTSD symptom reporting; The significance of contextual and individual factors.
2001		
V	Skinstad, Anne Helene, Dr. philos.	Substance dependence and borderline personality disorders.
	Binder, Per-Einar, Dr. psychol.	Individet og den meningsbærende andre. En teoretisk undersøkelse av de mellommenneskelige forutsetningene for psykisk liv og utvikling med utgangspunkt i Donald Winnicotts teori.
	Roald, Ingvild K., Dr. philos.	Building of concepts. A study of Physics concepts of Norwegian deaf students.
H	Fekadu, Zelalem W., Dr. philos.	Predicting contraceptive use and intention among a sample of adolescent girls. An application of the theory of planned behaviour in Ethiopian context.
	Melesse, Fantu, Dr. philos.	The more intelligent and sensitive child (MISC) mediational intervention in an Ethiopian context: An evaluation study.
	Råheim, Målfrid, Dr. philos.	Kvinners kroppserfaring og livssammenheng. En fenomenologisk – hermeneutisk studie av friske kvinner og kvinner med kroniske muskelsmerter.
	Engelsen, Birthe Kari, Dr. psychol.	Measurement of the eating problem construct.

	Lau, Bjørn, Dr. philos.	Weight and eating concerns in adolescence.
2002		
V	Ihlebæk, Camilla, Dr. philos.	Epidemiological studies of subjective health complaints.
	Rosén, Gunnar O. R., Dr. philos.	The phantom limb experience. Models for understanding and treatment of pain with hypnosis.
	Høines, Marit Johnsen, Dr. philos.	Fleksible språkrom. Matematikklæring som tekstutvikling.
	Anthun, Roald Andor, Dr. philos.	School psychology service quality. Consumer appraisal, quality dimensions, and collaborative improvement potential
	Pallesen, Ståle, Dr. psychol.	Insomnia in the elderly. Epidemiology, psychological characteristics and treatment.
	Midthassel, Unni Vere, Dr. philos.	Teacher involvement in school development activity. A study of teachers in Norwegian compulsory schools
	Kallestad, Jan Helge, Dr. philos.	Teachers, schools and implementation of the Olweus Bullying Prevention Program.
H	Ofte, Sonja Helgesen, Dr. psychol.	Right-left discrimination in adults and children.
	Netland, Marit, Dr. psychol.	Exposure to political violence. The need to estimate our estimations.
	Diseth, Åge, Dr. psychol.	Approaches to learning: Validity and prediction of academic performance.
	Bjuland, Raymond, Dr. philos.	Problem solving in geometry. Reasoning processes of student teachers working in small groups: A dialogical approach.
2003		
V	Arefjord, Kjersti, Dr. psychol.	After the myocardial infarction – the wives' view. Short- and long-term adjustment in wives of myocardial infarction patients.
	Ingjaldsson, Jón Þorvaldur, Dr. psychol.	Unconscious Processes and Vagal Activity in Alcohol Dependency.
	Holden, Børge, Dr. philos.	Følger av atferdsanalytiske forklaringer for atferdsanalysens tilnærming til utforming av behandling.
	Holsen, Ingrid, Dr. philos.	Depressed mood from adolescence to 'emerging adulthood'. Course and longitudinal influences of body image and parent-adolescent relationship.
	Hammar, Åsa Karin, Dr. psychol.	Major depression and cognitive dysfunction- An experimental study of the cognitive effort hypothesis.
	Sprugevica, Ieva, Dr. philos.	The impact of enabling skills on early reading acquisition.
	Gabrielsen, Egil, Dr. philos.	LESE FOR LIVET. Lesekompetansen i den norske voksenbefolkningen sett i lys av visjonen om en enhetsskole.
H	Hansen, Anita Lill, Dr. psychol.	The influence of heart rate variability in the regulation of attentional and memory processes.

	Dyregrov, Kari, Dr. philos.	The loss of child by suicide, SIDS, and accidents: Consequences, needs and provisions of help.
2004		
V	Torsheim, Torbjørn, Dr. psychol.	Student role strain and subjective health complaints: Individual, contextual, and longitudinal perspectives.
	Haugland, Bente Storm Mowatt Dr. psychol.	Parental alcohol abuse. Family functioning and child adjustment.
	Milde, Anne Marita, Dr. psychol.	Ulcerative colitis and the role of stress. Animal studies of psychobiological factors in relationship to experimentally induced colitis.
	Stornes, Tor, Dr. philos.	Socio-moral behaviour in sport. An investigation of perceptions of sportspersonship in handball related to important factors of socio-moral influence.
	Mæhle, Magne, Dr. philos.	Re-inventing the child in family therapy: An investigation of the relevance and applicability of theory and research in child development for family therapy involving children.
	Kobbeltvedt, Therese, Dr. psychol.	Risk and feelings: A field approach.
2004 **H**	Thomsen, Tormod, Dr. psychol.	Localization of attention in the brain.
	Løberg, Else-Marie, Dr. psychol.	Functional laterality and attention modulation in schizophrenia: Effects of clinical variables.
	Kyrkjebø, Jane Mikkelsen, Dr. philos.	Learning to improve: Integrating continuous quality improvement learning into nursing education.
	Laumann, Karin, Dr. psychol.	Restorative and stress-reducing effects of natural environments: Experiencal, behavioural and cardiovascular indices.
	Holgersen, Helge, PhD	Mellom oss - Essay i relasjonell psykoanalyse.
2005		
V	Hetland, Hilde, Dr. psychol.	Leading to the extraordinary? Antecedents and outcomes of transformational leadership.
	Iversen, Anette Christine, Dr. philos.	Social differences in health behaviour: the motivational role of perceived control and coping.
2005 **H**	Mathisen, Gro Ellen, PhD	Climates for creativity and innovation: Definitions, measurement, predictors and consequences.
	Sævi, Tone, Dr. philos.	Seeing disability pedagogically – The lived experience of disability in the pedagogical encounter.
	Wiium, Nora, PhD	Intrapersonal factors, family and school norms: combined and interactive influence on adolescent smoking behaviour.
	Kanagaratnam, Pushpa, PhD	Subjective and objective correlates of Posttraumatic Stress in immigrants/refugees exposed to political violence.

	Larsen, Torill M. B. , PhD	Evaluating principals` and teachers` implementation of Second Step. A case study of four Norwegian primary schools.
	Bancila, Delia, PhD	Psychosocial stress and distress among Romanian adolescents and adults.
2006 V	Hillestad, Torgeir Martin, Dr. philos.	Normalitet og avvik. Forutsetninger for et objektivt psykopatologisk avviksbegrep. En psykologisk, sosial, erkjennelsesteoretisk og teorihistorisk framstilling.
	Nordanger, Dag Øystein, Dr. psychol.	Psychosocial discourses and responses to political violence in post-war Tigray, Ethiopia.
	Rimol, Lars Morten, PhD	Behavioral and fMRI studies of auditory laterality and speech sound processing.
	Krumsvik, Rune Johan, Dr. philos.	ICT in the school. ICT-initiated school development in lower secondary school.
	Norman, Elisabeth, Dr. psychol.	Gut feelings and unconscious thought: An exploration of fringe consiousness in implicit cognition.
	Israel, K Pravin, Dr. psychol.	Parent involvement in the mental health care of children and adolescents. Emperical studies from clinical care setting.
	Glasø, Lars, PhD	Affects and emotional regulation in leader-subordinate relationships.
	Knutsen, Ketil, Dr. philos.	HISTORIER UNGDOM LEVER – En studie av hvordan ungdommer bruker historie for å gjøre livet meningsfullt.
	Matthiesen, Stig Berge, PhD	Bullying at work. Antecedents and outcomes.
2006 H	Gramstad, Arne, PhD	Neuropsychological assessment of cognitive and emotional functioning in patients with epilepsy.
	Bendixen, Mons, PhD	Antisocial behaviour in early adolescence: Methodological and substantive issues.
	Mrumbi, Khalifa Maulid, PhD	Parental illness and loss to HIV/AIDS as experienced by AIDS orphans aged between 12-17 years from Temeke District, Dar es Salaam, Tanzania: A study of the children's psychosocial health and coping responses.
	Hetland, Jørn, Dr. psychol.	The nature of subjective health complaints in adolescence: Dimensionality, stability, and psychosocial predictors
	Kakoko, Deodatus Conatus Vitalis, PhD	Voluntary HIV counselling and testing service uptake among primary school teachers in Mwanza, Tanzania: assessment of socio-demographic, psychosocial and socio-cognitive aspects
	Mykletun, Arnstein, Dr. psychol.	Mortality and work-related disability as long-term consequences of anxiety and depression: Historical cohort designs based on the HUNT-2 study
	Sivertsen, Børge, PhD	Insomnia in older adults. Consequences, assessment and treatment.

2007		
V	Singhammer, John, Dr. philos.	Social conditions from before birth to early adulthood – the influence on health and health behaviour
	Janvin, Carmen Ani Cristea, PhD	Cognitive impairment in patients with Parkinson's disease: profiles and implications for prognosis
	Braarud, Hanne Cecilie, Dr.psychol.	Infant regulation of distress: A longitudinal study of transactions between mothers and infants
	Tveito, Torill Helene, PhD	Sick Leave and Subjective Health Complaints
	Magnussen, Liv Heide, PhD	Returning disability pensioners with back pain to work
	Thuen, Elin Marie, Dr.philos.	Learning environment, students' coping styles and emotional and behavioural problems. A study of Norwegian secondary school students.
	Solberg, Ole Asbjørn, PhD	Peacekeeping warriors – A longitudinal study of Norwegian peacekeepers in Kosovo
2007		
H	Søreide, Gunn Elisabeth, Dr.philos.	Narrative construction of teacher identity
	Svensen, Erling, PhD	WORK & HEALTH. Cognitive Activation Theory of Stress applied in an organisational setting.
	Øverland, Simon Nygaard, PhD	Mental health and impairment in disability benefits. Studies applying linkages between health surveys and administrative registries.
	Eichele, Tom, PhD	Electrophysiological and Hemodynamic Correlates of Expectancy in Target Processing
	Børhaug, Kjetil, Dr.philos.	Oppseding til demokrati. Ein studie av politisk oppseding i norsk skule.
	Eikeland, Thorleif, Dr.philos.	Om å vokse opp på barnehjem og på sykehus. En undersøkelse av barnehjemsbarns opplevelser på barnehjem sammenholdt med sanatoriebarns beskrivelse av langvarige sykehusopphold – og et forsøk på forklaring.
	Wadel, Carl Cato, Dr.philos.	Medarbeidersamhandling og medarbeiderledelse i en lagbasert organisasjon
	Vinje, Hege Forbech, PhD	Thriving despite adversity: Job engagement and self-care among community nurses
	Noort, Maurits van den, PhD	Working memory capacity and foreign language acquisition
2008		
V	Breivik, Kyrre, Dr.psychol.	The Adjustment of Children and Adolescents in Different Post-Divorce Family Structures. A Norwegian Study of Risks and Mechanisms.
	Johnsen, Grethe E., PhD	Memory impairment in patients with posttraumatic stress disorder
	Sætrevik, Bjørn, PhD	Cognitive Control in Auditory Processing

	Carvalhosa, Susana Fonseca, PhD	Prevention of bullying in schools: an ecological model
2008		
H	Brønnick, Kolbjørn Selvåg	Attentional dysfunction in dementia associated with Parkinson's disease.
	Posserud, Maj-Britt Rocio	Epidemiology of autism spectrum disorders
	Haug, Ellen	Multilevel correlates of physical activity in the school setting
	Skjerve, Arvid	Assessing mild dementia – a study of brief cognitive tests.
	Kjønniksen, Lise	The association between adolescent experiences in physical activity and leisure time physical activity in adulthood: a ten year longitudinal study
	Gundersen, Hilde	The effects of alcohol and expectancy on brain function
	Omvik, Siri	Insomnia – a night and day problem
2009		
V	Molde, Helge	Pathological gambling: prevalence, mechanisms and treatment outcome.
	Foss, Else	Den omsorgsfulle væremåte. En studie av voksnes væremåte i forhold til barn i barnehagen.
	Westrheim, Kariane	Education in a Political Context: A study of Konwledge Processes and Learning Sites in the PKK.
	Wehling, Eike	Cognitive and olfactory changes in aging
	Wangberg, Silje C.	Internet based interventions to support health behaviours: The role of self-efficacy.
	Nielsen, Morten B.	Methodological issues in research on workplace bullying. Operationalisations, measurements and samples.
	Sandu, Anca Larisa	MRI measures of brain volume and cortical complexity in clinical groups and during development.
	Guribye, Eugene	Refugees and mental health interventions
	Sørensen, Lin	Emotional problems in inattentive children – effects on cognitive control functions.
	Tjomsland, Hege E.	Health promotion with teachers. Evaluation of the Norwegian Network of Health Promoting Schools: Quantitative and qualitative analyses of predisposing, reinforcing and enabling conditions related to teacher participation and program sustainability.
	Helleve, Ingrid	Productive interactions in ICT supported communities of learners
2009		
H	Skorpen, Aina Øye, Christine	Dagliglivet i en psykiatrisk institusjon: En analyse av miljøterapeutiske praksiser
	Andreassen, Cecilie Schou	WORKAHOLISM – Antecedents and Outcomes

	Stang, Ingun	Being in the same boat: An empowerment intervention in breast cancer self-help groups
	Sequeira, Sarah Dorothee Dos Santos	The effects of background noise on asymmetrical speech perception
	Kleiven, Jo, dr.philos.	The Lillehammer scales: Measuring common motives for vacation and leisure behavior
	Jónsdóttir, Guðrún	Dubito ergo sum? Ni jenter møter naturfaglig kunnskap.
	Hove, Oddbjørn	Mental health disorders in adults with intellectual disabilities - Methods of assessment and prevalence of mental health disorders and problem behaviour
	Wageningen, Heidi Karin van	The role of glutamate on brain function
	Bjørkvik, Jofrid	God nok? Selvaktelse og interpersonlig fungering hos pasienter innen psykisk helsevern: Forholdet til diagnoser, symptomer og behandlingsutbytte
	Andersson, Martin	A study of attention control in children and elderly using a forced-attention dichotic listening paradigm
	Almås, Aslaug Grov	Teachers in the Digital Network Society: Visions and Realities. A study of teachers' experiences with the use of ICT in teaching and learning.
	Ulvik, Marit	Lærerutdanning som danning? Tre stemmer i diskusjonen
2010		
V	Skår, Randi	Læringsprosesser i sykepleieres profesjonsutøvelse. En studie av sykepleieres læringserfaringer.
	Roald, Knut	Kvalitetsvurdering som organisasjonslæring mellom skole og skoleeigar
	Lunde, Linn-Heidi	Chronic pain in older adults. Consequences, assessment and treatment.
	Danielsen, Anne Grete	Perceived psychosocial support, students' self-reported academic initiative and perceived life satisfaction
	Hysing, Mari	Mental health in children with chronic illness
	Olsen, Olav Kjellevold	Are good leaders moral leaders? The relationship between effective military operational leadership and morals
	Riese, Hanne	Friendship and learning. Entrepreneurship education through mini-enterprises.
	Holthe, Asle	Evaluating the implementation of the Norwegian guidelines for healthy school meals: A case study involving three secondary schools
H	Hauge, Lars Johan	Environmental antecedents of workplace bullying: A multi-design approach
	Bjørkelo, Brita	Whistleblowing at work: Antecedents and consequences

	Reme, Silje Endresen	Common Complaints – Common Cure? Psychiatric comorbidity and predictors of treatment outcome in low back pain and irritable bowel syndrome
	Helland, Wenche Andersen	Communication difficulties in children identified with psychiatric problems
	Beneventi, Harald	Neuronal correlates of working memory in dyslexia
	Thygesen, Elin	Subjective health and coping in care-dependent old persons living at home
	Aanes, Mette Marthinussen	Poor social relationships as a threat to belongingness needs. Interpersonal stress and subjective health complaints: Mediating and moderating factors.
	Anker, Morten Gustav	Client directed outcome informed couple therapy
	Bull, Torill	Combining employment and child care: The subjective well-being of single women in Scandinavia and in Southern Europe
	Viig, Nina Grieg	Tilrettelegging for læreres deltakelse i helsefremmende arbeid. En kvalitativ og kvantitativ analyse av sammenhengen mellom organisatoriske forhold og læreres deltakelse i utvikling og implementering av Europeisk Nettverk av Helsefremmende Skoler i Norge
	Wolff, Katharina	To know or not to know? Attitudes towards receiving genetic information among patients and the general public.
	Ogden, Terje, dr.philos.	Familiebasert behandling av alvorlige atferdsproblemer blant barn og ungdom. Evaluering og implementering av evidensbaserte behandlingsprogrammer i Norge.
	Solberg, Mona Elin	Self-reported bullying and victimisation at school: Prevalence, overlap and psychosocial adjustment.
2011		
V	Bye, Hege Høivik	Self-presentation in job interviews. Individual and cultural differences in applicant self-presentation during job interviews and hiring managers' evaluation
	Notelaers, Guy	Workplace bullying. A risk control perspective.
	Moltu, Christian	Being a therapist in difficult therapeutic impasses. A hermeneutic phenomenological analysis of skilled psychotherapists' experiences, needs, and strategies in difficult therapies ending well.
	Myrseth, Helga	Pathological Gambling - Treatment and Personality Factors
	Schanche, Elisabeth	From self-criticism to self-compassion. An empirical investigation of hypothesized change prosesses in the Affect Phobia Treatment Model of short-term dynamic psychotherapy for patients with Cluster C personality disorders.
	Våpenstad, Eystein Victor, dr.philos.	Det tempererte nærvær. En teoretisk undersøkelse av psykoterapautens subjektivitet i psykoanalyse og psykoanalytisk psykoterapi.

	Haukebø, Kristin	Cognitive, behavioral and neural correlates of dental and intra-oral injection phobia. Results from one treatment and one fMRI study of randomized, controlled design.
	Harris, Anette	Adaptation and health in extreme and isolated environments. From 78°N to 75°S.
	Bjørknes, Ragnhild	Parent Management Training-Oregon Model: intervention effects on maternal practice and child behavior in ethnic minority families
	Mamen, Asgeir	Aspects of using physical training in patients with substance dependence and additional mental distress
	Espevik, Roar	Expert teams: Do shared mental models of team members make a difference
	Haara, Frode Olav	Unveiling teachers' reasons for choosing practical activities in mathematics teaching
2011		
H	Hauge, Hans Abraham	How can employee empowerment be made conducive to both employee health and organisation performance? An empirical investigation of a tailor-made approach to organisation learning in a municipal public service organisation.
	Melkevik, Ole Rogstad	Screen-based sedentary behaviours: pastimes for the poor, inactive and overweight? A cross-national survey of children and adolescents in 39 countries.
	Vøllestad, Jon	Mindfulness-based treatment for anxiety disorders. A quantitative review of the evidence, results from a randomized controlled trial, and a qualitative exploration of patient experiences.
	Tolo, Astrid	Hvordan blir lærerkompetanse konstruert? En kvalitativ studie av PPU-studenters kunnskapsutvikling.
	Saus, Evelyn-Rose	Training effectiveness: Situation awareness training in simulators
	Nordgreen, Tine	Internet-based self-help for social anxiety disorder and panic disorder. Factors associated with effect and use of self-help.
	Munkvold, Linda Helen	Oppositional Defiant Disorder: Informant discrepancies, gender differences, co-occuring mental health problems and neurocognitive function.
	Christiansen, Øivin	Når barn plasseres utenfor hjemmet: beslutninger, forløp og relasjoner. Under barnevernets (ved)tak.
	Brunborg, Geir Scott	Conditionability and Reinforcement Sensitivity in Gambling Behaviour
	Hystad, Sigurd William	Measuring Psychological Resiliency: Validation of an Adapted Norwegian Hardiness Scale
2012		
V	Roness, Dag	Hvorfor bli lærer? Motivasjon for utdanning og utøving.
	Fjermestad, Krister Westlye	The therapeutic alliance in cognitive behavioural therapy for youth anxiety disorders

	Jenssen, Eirik Sørnes	Tilpasset opplæring i norsk skole: politikeres, skolelederes og læreres handlingsvalg
	Saksvik-Lehouillier, Ingvild	Shift work tolerance and adaptation to shift work among offshore workers and nurses
	Johansen, Venke Frederike	Når det intime blir offentlig. Om kvinners åpenhet om brystkreft og om markedsføring av brystkreftsaken.
	Herheim, Rune	Pupils collaborating in pairs at a computer in mathematics learning: investigating verbal communication patterns and qualities
	Vie, Tina Løkke	Cognitive appraisal, emotions and subjective health complaints among victims of workplace bullying: A stress-theoretical approach
	Jones, Lise Øen	Effects of reading skills, spelling skills and accompanying efficacy beliefs on participation in education. A study in Norwegian prisons.
2012 H	Danielsen, Yngvild Sørebø	Childhood obesity – characteristics and treatment. Psychological perspectives.
	Horverak, Jøri Gytre	Sense or sensibility in hiring processes. Interviewee and interviewer characteristics as antecedents of immigrant applicants' employment probabilities. An experimental approach.
	Jøsendal, Ola	Development and evaluation of BE smokeFREE, a school-based smoking prevention program
	Osnes, Berge	Temporal and Posterior Frontal Involvement in Auditory Speech Perception
	Drageset, Sigrunn	Psychological distress, coping and social support in the diagnostic and preoperative phase of breast cancer
	Aasland, Merethe Schanke	Destructive leadership: Conceptualization, measurement, prevalence and outcomes
	Bakibinga, Pauline	The experience of job engagement and self-care among Ugandan nurses and midwives
	Skogen, Jens Christoffer	Foetal and early origins of old age health. Linkage between birth records and the old age cohort of the Hordaland Health Study (HUSK)
	Leversen, Ingrid	Adolescents' leisure activity participation and their life satisfaction: The role of demographic characteristics and psychological processes
	Hanss, Daniel	Explaining sustainable consumption: Findings from cross-sectional and intervention approaches
	Rød, Per Arne	Barn i klem mellom foreldrekonflikter og samfunnsmessig beskyttelse
2013 V	Mentzoni, Rune Aune	Structural Characteristics in Gambling

	Knudsen, Ann Kristin	Long-term sickness absence and disability pension award as consequences of common mental disorders. Epidemiological studies using a population-based health survey and official ill health benefit registries.
	Strand, Mari	Emotional information processing in recurrent MDD
	Veseth, Marius	Recovery in bipolar disorder. A reflexive-collaborative exploration of the lived experiences of healing and growth when battling a severe mental illness
	Mæland, Silje	Sick leave for patients with severe subjective health complaints. Challenges in general practice.
	Mjaaland, Thera	At the frontiers of change? Women and girls' pursuit of education in north-western Tigray, Ethiopia
	Odéen, Magnus	Coping at work. The role of knowledge and coping expectancies in health and sick leave.
	Hynninen, Kia Minna Johanna	Anxiety, depression and sleep disturbance in chronic obstructive pulmonary disease (COPD). Associations, prevalence and effect of psychological treatment.
	Flo, Elisabeth	Sleep and health in shift working nurses
	Aasen, Elin Margrethe	From paternalism to patient participation? The older patients undergoing hemodialysis, their next of kin and the nurses: a discursive perspective on perception of patient participation in dialysis units
	Ekornås, Belinda	Emotional and Behavioural Problems in Children: Self-perception, peer relationships, and motor abilities
	Corbin, J. Hope	North-South Partnerships for Health: Key Factors for Partnership Success from the Perspective of the KIWAKKUKI
	Birkeland, Marianne Skogbrott	Development of global self-esteem: The transition from adolescence to adulthood
2013 H	Gianella-Malca, Camila	Challenges in Implementing the Colombian Constitutional Court's Health-Care System Ruling of 2008
	Hovland, Anders	Panic disorder – Treatment outcomes and psychophysiological concomitants
	Mortensen, Øystein	The transition to parenthood – Couple relationships put to the test
	Årdal, Guro	Major Depressive Disorder – a Ten Year Follow-up Study. Inhibition, Information Processing and Health Related Quality of Life
	Johansen, Rino Bandlitz	The impact of military identity on performance in the Norwegian armed forces
	Bøe, Tormod	Socioeconomic Status and Mental Health in Children and Adolescents
2014 V	Nordmo, Ivar	Gjennom nåløyet – studenters læringserfaringer i psykologutdanningen

	Dovran, Anders	Childhood Trauma and Mental Health Problems in Adult Life
	Hegelstad, Wenche ten Velden	Early Detection and Intervention in Psychosis: A Long-Term Perspective
	Urheim, Ragnar	Forståelse av pasientaggresjon og forklaringer på nedgang i voldsrate ved Regional sikkerhetsavdeling, Sandviken sykehus
	Kinn, Liv Grethe	Round-Trips to Work. Qualitative studies of how persons with severe mental illness experience work integration.
	Rød, Anne Marie Kinn	Consequences of social defeat stress for behaviour and sleep. Short-term and long-term assessments in rats.
	Nygård, Merethe	Schizophrenia – Cognitive Function, Brain Abnormalities, and Cannabis Use
	Tjora, Tore	Smoking from adolescence through adulthood: the role of family, friends, depression and socioeconomic status. Predictors of smoking from age 13 to 30 in the "The Norwegian Longitudinal Health Behaviour Study" (NLHB)
	Vangsnes, Vigdis	The Dramaturgy and Didactics of Computer Gaming. A Study of a Medium in the Educational Context of Kindergartens.
	Nordahl, Kristin Berg	Early Father-Child Interaction in a Father-Friendly Context: Gender Differences, Child Outcomes, and Protective Factors related to Fathers' Parenting Behaviors with One-year-olds
2014 H	Sandvik, Asle Makoto	Psychopathy – the heterogenety of the construct
	Skotheim, Siv	Maternal emotional distress and early mother-infant interaction: Psychological, social and nutritional contributions
	Halleland, Helene Barone	Executive Functioning in adult Attention Deficit Hyperactivity Disorder (ADHD). From basic mechanisms to functional outcome.
	Halvorsen, Kirsti Vindal	Partnerskap i lærerutdanning, sett fra et økologisk perspektiv
	Solbue, Vibeke	Dialogen som visker ut kategorier. En studie av hvilke erfaringer innvandrerungdommer og norskfødte med innvandrerforeldre har med videregående skole. Hva forteller ungdommenes erfaringer om videregående skoles håndtering av etniske ulikheter?
	Kvalevaag, Anne Lise	Fathers' mental health and child development. The predictive value of fathers' psychological distress during pregnancy for the social, emotional and behavioural development of their children
	Sandal, Ann Karin	Ungdom og utdanningsval. Om elevar sine opplevingar av val og overgangsprosessar.

	Haug, Thomas	Predictors and moderators of treatment outcome from high- and low-intensity cognitive behavioral therapy for anxiety disorders. Association between patient and process factors, and the outcome from guided self-help, stepped care, and face-to-face cognitive behavioral therapy.
	Sjølie, Hege	Experiences of Members of a Crisis Resolution Home Treatment Team. Personal history, professional role and emotional support in a CRHT team.
	Falkenberg, Liv Eggset	Neuronal underpinnings of healthy and dysfunctional cognitive control
	Mrdalj, Jelena	The early life condition. Importance for sleep, circadian rhythmicity, behaviour and response to later life challenges
	Hesjedal, Elisabeth	Tverrprofesjonelt samarbeid mellom skule og barnevern: Kva kan støtte utsette barn og unge?
2015 V	Hauken, May Aasebø	«*The cancer treatment was only half the work!»* A Mixed-Method Study of Rehabilitation among Young Adult Cancer Survivors
	Ryland, Hilde Katrin	Social functioning and mental health in children: the influence of chronic illness and intellectual function
	Rønsen, Anne Kristin	Vurdering som profesjonskompetanse. Refleksjonsbasert utvikling av læreres kompetanse i formativ vurdering
	Hoff, Helge Andreas	Thinking about Symptoms of Psychopathy in Norway: Content Validation of the Comprehensive Assessment of Psychopathic Personality (CAPP) Model in a Norwegian Setting