Child Care Practices, Resources for Care, and Nutritional Outcomes in Ghana

Findings from Demographic and Health Surveys

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Scientific environment

The studies presented in this dissertation include contributions from the Department of Health Promotion and Development, University of Bergen. During my period as a PhD student, I have been a member of Research Unit for Social Determinants of Health in Very poor Ruralities and the research group Multicultural Venues in Health, Gender and Social Justice. I was also enrolled into the Graduate School of Human Interaction and Growth at the Faculty of Psychology, University of Bergen.

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Abstract

Introduction: The overarching empirical question of this study is this: how are children growing in Ghana and how is childcare related to child growth?

Child health is a fundamental public health issue, for children's sake AND because good child health sets one up for life long health and functioning, and well-being. In sub-Saharan Africa (SSA), child physical health is of particular concern due the high rates of illness and mortality in this region. The leading causes of child morbidity and mortality in SSA include but are not limited to measles, diarrheal infections, respiratory infections, malaria, HIV and nutritional deficiencies. In Ghana, the focus of this study, respiratory infections, diarrheal infections, malaria and nutritional deficiencies (malnutrition) remain the major diseases plaguing children less than 5 years of age. Malnutrition is the underlying cause of 40% of all deaths among children less than 5 years in Ghana and almost three out of every ten children in Ghana are stunted. There have been major interventions by the government of Ghana and her partners such as WHO and UNICEF to combat childhood diseases in the country.

However, a lot needs to be done as yet, especially research on long term trends in child health within social segments in the country, that have yet to be elucidated well enough. This is important to help guide better national and local health promotion policy-making and practice. Further, while home care is understood to be of vital importance to child health, too little is yet known about childcare practices and how these influence child health in Ghana.

The present study therefore set out to address the following questions: What are the trends over time in child malnutrition prevalence in socio-demographic subgroups within the 10 Ghana geographic regions (provinces)? What are the relationships of dietary diversity to childhood wasting in urban and in rural Ghana, when control variables related to maternal,

child and household characteristics are accounted for? What influence do childcare practices have on children's height-for-age z-scores, controlling for factors at child, maternal, household and community levels? Do some children in Ghana benefit more from care than others?

Methodology: This dissertation uses data from the Ghana Demographic and Health Surveys (DHS), conducted in Ghana in 1993, 1998, 2003 and 2008. The main indicators of child growth were height-for-age, weight-for-age and weight-for-height Z-scores. Children with height-for-age, weight-for-age and weight-for-height Z-scores less than -2 standard deviations (SD) of the WHO reference population were defined as stunted (chronically malnourished), underweight, and/or wasted (acutely malnourished), respectively. In the present study, the indicators were used both as continuous and categorical variables. The study employs three main analytical methodologies: trend analysis—examines the time trends of child malnutrition over time, logistic regression analysis— examines the relationship between dietary diversity and child nutritional status, and multiple regression analysis—examines the association between childcare practices (CCP) score and height-for-age z-scores (HAZ).

Main results: The results of the time trends analysis at the national level showed statistically significant declining trends for stunting ($F(1, 7204) = 7.89$, $p < .005$) and underweight ($F(1, 7441) = 44.87$, $p<.001$). The declining trends for wasting were also statistically significant ($F(1, 7130) = 6.19$, $p < .013$). In the rural/urban place of residence data, there was a stable and statistically insignificant trend in stunting for urban males and females and rural females, while the declining trend for rural males was statistically significant. Analysis by maternal education show a significant increasing trend in stunting for males ($F(1, 2004) = 3.92$, $p < .048$) and for females ($F(1, 2004) = 4.34$, $p < .037$) whose

mothers had higher than primary education, while the trends decreased significantly for male and females whose mothers had no education. The logistic regression results showed that high dietary diversity score (DDS) was associated with improved growth outcomes in rural settings. A unit increase in DDS was associated with an 11% reduced odds of being wasted (OR = 0.89, 95%, C.I 0.80-0.99). In the multiple regression analysis, CCP was a significant predictor of HAZ, after controlling for covariates/confounders at child, maternal and household levels. Children with higher CCP scores had higher HAZ scores. Statistical interaction analyses revealed no subgroup differences in the CCP/HAZ relationship, such that no subgroup benefited less from good care than other subgroups.

Conclusions: Overall, national malnutrition trends have declined significantly, but this decline did not benefit all segments of society, as there were static to worsening trends in some socio-demographic subgroups. Also, dietary diversity has a modest but statistically significant association with acute malnutrition in rural but not in urban Ghana. Intervention research to combat acute malnutrition in rural settings should include efforts to promote the consumption of a variety of food groups.

List of publications

Amugsi DA, Mittelmark MB, Lartey A. An analysis of socio-demographic patterns in child malnutrition trends using Ghana demographic and health survey data in the period 1993–2008; BMC Public Health 2013;13:960.

Amugsi DA, Mittelmark MB, Lartey A. Dietary Diversity is a Predictor of Acute Malnutrition in Rural but Not in Urban Settings: Evidence from Ghana; British Journal of Medicine and Medical Research. 2014; 4(25):4310-24.

Amugsi DA, Mittelmark MB, Mantanda DJ, Urke HB. Influence of Childcare practices on nutritional status of Ghanaian children: a regression analysis of the Ghana Demographic and Health Surveys. 2014; (Accepted for publication in BMJ Open)

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1. INTRODUCTION

1.1 Background

The overarching empirical question of this study is, how are children growing in Ghana and how is childcare related to child growth?

Child health is a fundamental health promotion issue, for children's sake AND because good child health sets one up for life long health and functioning, and well-being. Child physical health in the Global South is of particular concern due the high rates of illness and mortality in the equatorial region. In 2002, an estimated 11.4 million children under age 10 died from preventable diseases. The leading causes of child morbidity and mortality in SSA include but are not limited to measles, diarrheal infections, respiratory infections, malaria, HIV and nutritional deficiencies (1)**.** In Ghana, the focus of this study, malaria and nutritional deficiencies (malnutrition) remain the major diseases plaguing Ghanaian children less than 5 years of age. Malnutrition is the underlying cause of 40% of all deaths among children less than 5 years in Ghana and almost three out of every ten children in Ghana are stunted (2)

Diseases as noted above threaten child health, and there have been major interventions by government of Ghana and her partners such as WHO and UNICEF to combat these diseases in Ghana. Some of these interventions include oral rehydration therapy, immunization, growth monitoring, integrated management of childhood illness, community management of acute malnutrition, bed net use, just to mention a few. The implementation of these programmes more often than not places less emphasis on health promotion, which ideally works in combinations with effective disease prevention strategies. A health promotion

strategy is urgently called for, to help families and communities combat child disease and promote optimal growth and development. Health promotion is defined as

> "the process of enabling people to increase control over, and to improve, their health. To reach a state of complete physical, mental and social wellbeing, an individual or group must be able to identify and to realize aspirations, to satisfy needs, and to change or cope with the environment. Health is, therefore, seen as a resource for everyday life, not the objective of living. Health is a positive concept emphasizing social and personal resources, as well as physical capacities. Therefore, health promotion is not just the responsibility of the health sector, but goes beyond healthy lifestyles to wellbeing" (3).

It can be observed from the preceding definition that in health promotion, the emphasis is solely not on peoples' deficits, problems and risk factors, but is also on people's assets and resources for health, and on ways society can help empower people to use and develop health promotion resources, and thereby gain better control over their own health.

Therefore, medical care is vitally important, but only as part of the answer to better child health in Ghana. At least equally important is home and community care: maternal resources for childcare and household resources (especially food security in the context of children in the Global South). The WHO and UNICEF and many experts have called for a resource-focussed approach, exemplified by the UNICEF childcare framework (4-6).

However, the design, implementation and monitoring of effective health promotion interventions depend on the availability of high quality public health surveillance data to illuminate the epidemiological situation and help trace trends over time in health, risk factors

and protective factors. In this regard, there remain vital knowledge gaps about child health in Ghana that must be filled. Among these gaps, the long term trends in child health within social segments in the country have yet to be elucidated well enough; this is important to help guide better national and local health promotion policy-making and practice. Further, while home care is understood to be of vital importance to child health, too little is yet known about childcare practices and how these influence (are associated with) child health.

This dissertation aims to help fill some of the knowledge gaps, by addressing these questions:

1. What are the time trends in child malnutrition prevalence in socio-demographic groups within the Ghana geographic regions?

2. What are the relationships of dietary diversity to childhood wasting in urban and in rural Ghana, when control variables related to maternal, child and household characteristics are accounted for?

3. What influence do childcare practices have on children's height-for-age z-scores, controlling for factors at child, maternal, household and community levels?

4. Do some children in Ghana benefit more from care than others?

1.2 Definitions

Malnutrition: Refers to 'an abnormal physiological condition caused by inadequate, excessive or imbalanced intake in macronutrients: carbohydrates, protein, fats- and micronutrients'

Under-nutrition: This is condition where the body does not have adequate amounts of one or more nutrients and usually reflects in anthropometric indicators such as stunting (height-for-age), underweight (weight-for-age) and wasting (weight-for-height).

Stunting: This reflects short stature-for-age. A child who has height-for-age z-scores less than -2 standard deviations of the reference population of well-nourished children is considered chronically malnourished (stunted)

Underweight: Reflects too light for age. Children whose weight-for-age z-score is less than -2 standard deviation of the reference population of well-nourished or healthy children is considered to be underweight.

Wasting: reflects too thin for height and is due to recent and severe shortage of food and/ or disease. A child who has a weight-for-height z-score less than -2 standard deviations of the reference population is considered acutely malnourished.

Food security: refers to a state of living in hunger and not risking severe deficiency in energy and nutrient intake

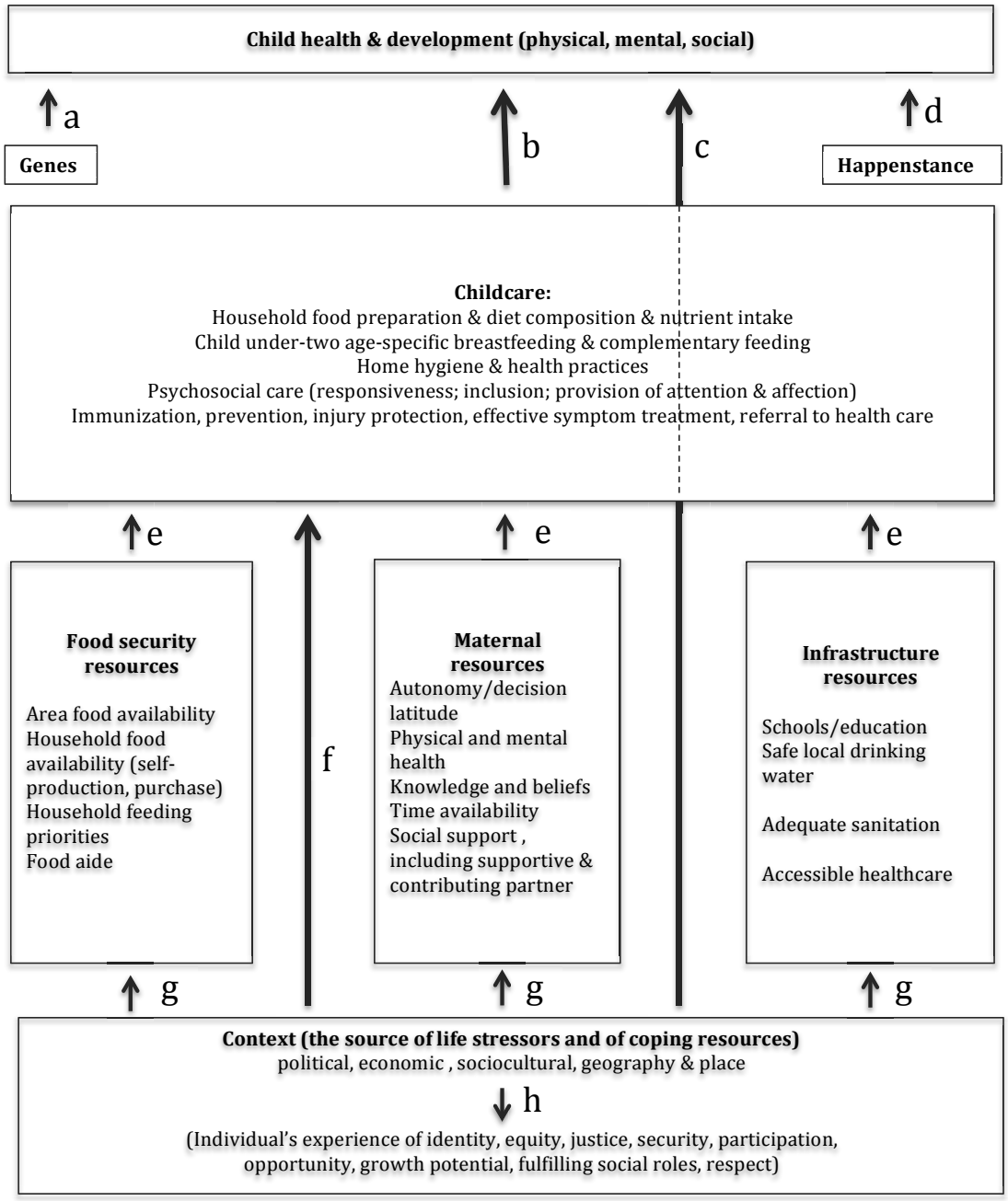
Dietary diversity: A number of food groups a child consumed over 24 hours period

1.3 Conceptual framework

This dissertation has adapted the UNICEF conceptual model of child health (4, 5, 7, 8) as both a conceptual and an analytical framework. This is a social ecological model encompassing factors at the individual, household and societal levels (Figure 1). The endpoint in the model is child health, which in this dissertation is measured by child growth. The model recognises that genes (9-11) and happenstance (arrows a and d in Figure 1) have direct effects on child health, independent of other factors in the model. The concept happenstance refers to events such as wars, floods, violence, accidence and conflicts that can have an immediate and direct negative impact on child health, regardless of social situation, living conditions and child care practices. The model also recognises that child health is determined partly by the quality of care provided by caregivers. The model identified the following care practices as vital for child growth, survival and development: household food preparation and diet composition and nutrient intake, breastfeeding and complimentary feeding, home hygiene and health practices, psychosocial care and curative and preventive health care. All these factors have a direct effect on child health *(arrows b and c)*.

The model also emphasises that for the caregiver(s) to be able to provide quality caregiving as outlined above they need resources. In the model, these resources are grouped into food security, maternal and infrastructural resources. These resources have indirect influence on childcare *(arrow e)*. Maternal resources, for instance, are needed by the mother to be able to perform caregiving. The availability of these resources can lead to good childcare practices, which will in turn influence child growth and development. The model also highlights the salience of contextual factors: life stressors, coping resources, political, economic, socio-cultural factors, and place of residence (9).

Figure 1. Model of childcare. [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/mc-venues), from UNICEF, 1990; Engle, Menon and Haddad, 1999; Smith and Haddad, 2000.

1.3.1 Care practices and determinants of child growth

The conceptual framework guides the following discussion of eight key subjects: disease and dietary intake, food security, care for women, feeding practices, hygiene practices, home health practices, health services and healthy environment.

1.3.1.1 Disease and dietary intake

Disease and diet are considered the most significant immediate determinants of child nutritional status (5)**.** The relationship between these two factors is bidirectional—inadequate diet can lead to poor nutritional status, which increases the risk of disease, and frequent illness caused by disease can impair child nutritional status. Inadequate dietary intake makes children susceptible to disease and infection (9). Infection causes loss of appetite, impairs the absorption of food nutrients, increases nutrient losses and diverts nutrients away from growth (10). Infections can further affect the child's eating behaviour and how the child is cared for (5)**.** This interplay between disease and dietary intake notwithstanding, there is evidence in the literature that dietary intake independently determines child nutritional status. In rural South Africa, inadequate dietary intake was associated with poor vitamin A and iron status, and consequently linear growth retardation (11, 12)

1.3.1.2 Food security

Food security is achieved when "all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preference for an active and healthy life" (13). In developing countries, many households are unable to achieve food security. This is possibly due to lack of resources necessary for

adequate food production and poor purchasing power due to non-existence or low incomes (9)**.** Children in food-insecure households are more prone to malnutrition than are their counterparts in food-secure households. A study in Ghana observed that children in food - secure households were more than four times less likely to suffer from chronic malnutrition compared to those in the food-insecure households (14)**.** A study in Ethiopia revealed that in addition to household food insecurity, maternal distress and household socio-economic status were independent contributors to children under-nutrition (15). The situation is not different in other resource-constrained settings in other parts of the world. In South America, a number of studies have found evidence of significant associations between food security and child nutritional outcomes. Hackett and colleagues (16) found in Colombia that apart from children being malnourished in food insecure households, they were also affected by diseases such as diarrhea and respiratory infections. Associations between food security and child nutritional outcomes were also observed in Brazil (17)**.** Conversely, a study in Nepal found that though food insecurity was common, and malnutrition rates were high, there was no association found between food insecurity and nutritional status (18).

1.3.1.3 Care for women

Caring for women is vital, not only for their own health and well-being, but for the well-being of their children, as women are usually the principal child caregivers. Engle and colleagues (19) identified six key categories of care that can be provided for women: care during pregnancy and lactation, reproductive health support, physical health and nutritional status, mental health and self-confidence, autonomy and respect in the family, and educational opportunities. All these are important for the promotion of health and well-being of women and children. However, the discussion in this section will be limited to care for women during pregnancy and lactation. The family can play a significant role in the care for

pregnant and lactating mothers. They can do this by supporting women to obtain extra and higher quality foods, reduce workloads and ensure that women attend antenatal care clinics and receive professional care during childbirth. Factors such as workloads have a significant impact on pregnancy outcomes such as birth weight (20)**.** Pregnant women who experience high physical exertion are more likely to give birth to low weight children (LBW), compared to those who did not experience high physical exertion (20)**.** The consequences of LBW are poor growth outcomes during childhood (21) and increased morbidity (22, 23). This suggests how important it is for proper care to be given to women during the period of pregnancy. There is a paucity of evidence on how much family support impacts on pregnant and lactating mothers' behaviour (6). Nevertheless, one study among Mexican women has shown that family support can have significant positive impact on the behaviour of primiparous women (24). Regarding maternal diet, poor maternal nutrition can lead to low birth weight in developing countries (21). This implies that one of the ways to address LBW is to improve maternal intake of nutritious food, and the family has a critical role in making nutritious food available to pregnant women.

1.3.1.4 Feeding practices

Feeding is one of the important elements of childcare. It encompasses breastfeeding, complementary feeding and appropriate food diversity. There is significant evidence in the literature on the impact of feeding practices on child survival, growth and development. A study using Demographic and Health Surveys (DHS) data from Latin America reveals that good child feeding practices were significantly associated with child nutritional status. This was particularly so for children in the lower socioeconomic status and those of mothers with primary school (25)**.** Similarly, studies using infant feeding index (a composite variable created using all the key infant feeding practices variables**)** also found significant

associations between the indices and child nutritional status (26, 27). Interestingly, one of these studies documented that not all the components of the infant feeding index was positively associated with child nutritional status. For example, breastfeeding was found to exhibit a reverse association among older children (27). Thus, older children who were breastfeeding were at higher risk of under-nutrition than those who were not breastfeeding. This negative association reflects reverse causality (28)**.** The meaning of this is that it is not the increased breastfeeding that led to poor growth but rather children's poor growth that led to increased breastfeeding (28)**.** Several studies have also examined the relationship between dietary diversity and children nutritional outcomes. The findings are consistently that dietary diversity is a significant predictor of children nutritional status (29-33)**.**

1.3.1.5 Hygiene practices

Hygiene practices are classified into two broad categories (7): personal hygiene practices (i.e., hand washing, and bathing and cleaning the child) and household hygiene practices (i.e., cleaning house, proper disposal of child's waste, use of sanitary facilities and safe water). Good hygiene practices have direct effect on the cleanliness of the environment thereby reducing the possibility of children ingesting infectious agents through either contaminated food or water. In Ethiopia, the presence of child waste inside the house, caregiver feeding the child with washed/unwashed hands and the handling of drinking water were associated with child nutritional outcomes(34). Also children who live in good hygiene practices households have significant reduction in their stunting levels(35). Use of improved water also has an impact on children nutritional status. In Lesotho, families who used only improved water sources for drinking needs had children who gained 0.44 cm and 235 g more in six months compared to those who were using mixed quality water supplies (36). Hygiene practices also play a role in child morbidity. Children in households with poor hygiene have

higher episodes of diarrhea than those in good hygiene households (37-39)**.** Diarrheal infectious places children at elevated risk of under-nutrition (40, 41) and under-nutrition makes children susceptible to other diseases (42)**.**

1.3.1.6 Home health practices

Studies in a number of developing countries reveal that over 70% of health care treatment is performed at home by mothers (7, 43). Proper home health practices can help in reducing illness among children, and consequently the effect illness has on child growth and development. Home health practices include management of illness (prevention, diagnosis and treatment), utilization of health services (prevention and promotion) and timely seeking of curative health services (6, 7). Home health practices such as seeking immunization are associated with better children growth, survival and development; children who are fully immunized tend to have better growth status than those who are not immunized (44-45).

Maternal ability to identify the signs of growth deficiencies in children is important for proper care of the child and therefore good child health outcomes. In research in Ghana, maternal knowledge about the causes of *kwashiorkor* (a local term referring to severe acute malnutrition) was associated with children nutritional outcomes (44). In Nairobi, Kenya, a study revealed a negative association between maternal ability to recognized signs of malnutrition, knowledge about dietary management during illness and children nutritional status (45). Similarly, Niamego did not find any relationship between maternal knowledge about childhood illness and nutritional status (46). Nevertheless, maternal health seeking behaviour was associated with better nutrition in Cameroon (47)**.** Even though the findings just mentioned are mixed, home care such as immunization and maternal health seeking

behavior do seem to have a beneficial effect on children growth in most of the Global South contexts studied.

1.3.1.7 Health services

UNICEF observed that an "essential element of good health is access to curative and preventive health services that are affordable and of good quality" (5)**.** For good child health and development, families need to have access to health facilities within a reasonable distance, and that have qualified staff and requisite equipment to provide care needed for children. A study in Ghana found a positive association between child health service availability and children survival (48)**.** In this same study, child growth was positively associated with health facility size, presence of child health services and the availability of essential drugs (48). In Nepal, availability of outreach clinics and structural quality of the closest public health facility was associated with increased maternal-child care services usage (49).

1.3.1.8 Healthy environment

In terms of environmental health, inadequate access to water supply and improper sanitation practices coupled with unhygienic handling of food, place children at an elevated risk of childhood diarrheal infections (50). For example, household environmental cleanliness was observed to have a significant impact on the growth of Bangladeshi children (51)**.** In Ethiopia, poor handling of household drinking water was associated with poor nutritional outcomes of children(34). Furthermore, meta-analysis of water, sanitation and hygiene (WASH) interventions (implemented to reduce infectious disease and improve nutrition

outcomes) from 10 low and middle countries observed that WASH interventions had positive effects on children's nutritional status (52)**.**

1.3.2 Care and resources for care

Care can be defined as " the provision in the household and the community of time, attention, and support to meet the physical, mental, and social needs of the growing child and other household members" (53). These actions translate food security and health care resources into positive outcomes for child growth, survival and development (6, 53). Care is particularly critical from birth to two years. This is the period described as a "critical window" for the promotion of optimal child growth, health and development (10). Regarding the significant of care to child health, Engle and colleagues (7) observed that "even when poverty causes food insecurity and limited health care, enhanced caregiving can optimize the use of existing resources to promote good health and nutrition in women and children. Breastfeeding is an example of a practice, which provides food, health and care simultaneously" (7)**.** For a caregiver to be able to perform care adequately, they will need certain key resources. These resources are described in the model of care in Figure 1 as food security, maternal and infrastructural resources, as discussed below.

1.3.2.1 Food security resources

The framework suggests four food security resources: area food availability, household food availability (self-production, purchase), household feeding priorities and food aide. These resources are indeed important for good childcare practices. However, detail review of the literature on these resources is beyond the scope of this dissertation, since hardly any data on food security are collected in the DHS, which is the sole data source for this project. While

this might well be regarded as a shortcoming of the DHS and therefore of this study, the DHS questionnaires are already very extensive, and it seems beyond the capacity of a single survey to capture all the elements of childcare that one might wish.

1.3.2.2 Maternal resources

Maternal resources are things needed by the mother to be able to perform caregiving. The model suggests a number of key maternal resources: education, physical health and nutritional status, mental health, autonomy, occupation, wealth index, and social support. The details of these resources are discussed below.

1.3.2.2.1 Maternal education and caregiving

Engle and colleagues observed that the association between maternal education and breastfeeding is complex(19). For instance, although, education increases the mother's ability to understand the importance of good caregiving, it may also affect the time the mother has for childcare (19). Educated mothers are more likely to be involved in economic activities away from home, thereby reducing the time available for care. In Nigeria, mothers with no education were engaged in more prolonged breastfeeding than those with primary and post-primary education(54). Similar finding were obtained in Israel (55). Conversely, Bertini and colleagues found that lack of breastfeeding was associated with low level of maternal education and maternal profession as housewife or blue collar worker (56). A study in Accra, using a childcare practices index, concluded that poor maternal schooling is the main constraint of good childcare practices in urban Ghana (57). A study using the Ghana Demographic and Health Survey (GDHS) data observed that maternal-child health services usage was shaped mostly by the level of maternal education (58). Another study, also using

the GDHS data, observed a link between maternal education and health knowledge, which in turns influences the use of health services (59). The associations between maternal education and health services utilization have also been documented in other settings (60-63). In the Philippines, maternal education was found to be the most consistent and important determinant of the use of family planning services, prenatal care, childhood immunization and oral rehydration (62).

Maternal education is also important for mother-child interactions. There is empirical evidence suggesting that educated mothers tend to have a more committed attitude towards childcare than uneducated mothers (64-66)**.** Richman and colleagues (64) found in the Mexican city of Cuernavaca that mothers' responsiveness during infancy, especially in the verbal mode, was influenced by maternal school attendance. Also, better educated mothers were likely to feed their children when they cry (64). Another study found that mothers were more sensitive to childcare needs when they were more educated (66)**.** Children were also found to be more positively engaged with their mothers when maternal education was greater (66). The discussion of the literature in this section suggests that maternal education has both positive and negative effects on caring practices such as breastfeeding. However, with regard to health services usage and responsive care, only a positive association has been established.

1.3.2.2.2 Maternal physical health and nutritional status and caregiving

The association between maternal nutritional status and health, and child physical health is well-established (67-72). However, the link between maternal physical health and nutritional status, and childcare practices has scarcely been investigated (73). Two main links have been

suggested, direct and indirect (19)**.** The direct link focuses on the effect of poor nutrition on maternal energy levels and consequently her ability to engage in good care practices. Winkvist (73) observed that poor maternal health and nutritional status can have an effect on optimal child survival, growth and development, exemplified by a study in Egypt wherein anaemic mothers were less active care givers compared to non-anaemic mothers (74). The anaemia level of the mother also affects mother-child interaction. Perez and colleagues found that anaemic mothers were significantly more negative towards their babies, engaged less, and were less responsive than mothers who were not anaemic (75). In South Africa, a strong association was found between maternal iron status and depression, stress, and cognitive functioning during postpartum period (76).

Additionally, there is a relationship between the health and nutritional status and productivity of the individual, which may have a bearing on household food security and consequently care and nutritional outcomes. Untoro and colleagues (77) found in Indonesia, a significant association between female workers' anaemia and work productivity. The anaemic women produced 4.9% times less than the non-anaemic women (77). In a related study, in addition to low productivity, anaemic women were found to be less active at home (78). This physical inactivity can have an effect on caregiving. Low BMI (a measure of chronic energy deficiency) is also associated with low productivity(77, 79). As illustrated above, women with poor nutritional status are less economically productive; one could therefore expect that they would spend more time in their homes and consequently on child care. However, there is a paucity of literature on the assessment of quality of care provided with low reserves of energy (19).

The indirect link as described by Engle and colleagues is related to the effect of maternal nutritional status on pregnancy outcomes, and the behaviour of the child, which would in turn affect caregiving behaviour of the mother or caregiver (19). There is substantial empirical evidence on the effect of maternal nutritional status and pregnancy outcomes (80-85). In Jamaica, mothers with low weight, height and BMI had babies who were smaller, shorter and with smaller heads (80). Also, a study in India found that low maternal weight was associated significantly with low birth weight (84). The consequences of low birth weight and maternal responsiveness to caregiving have been documented (86). Furthermore, there is evidence for a link between maternal nutritional status and infant behaviour (19, 87-90). It was observed in a study in Egypt that maternal consumption of energy and animal protein, iron and zinc had a positive relationship with neonatal "habituation" behaviours (90). Similarly, McCullough and colleagues found that breast milk vitamin B-6 was associated significantly with infants' ability to be consoled, crying behaviour and response to stimulation (88). Also in this study, mothers with low levels of vitamin B-6 were found to be less responsive to their infants' vocalization, as well as less effective in attending to infants in distress (88). The literature above clearly demonstrates that poor maternal nutritional status limits mothers' ability to perform good care practices, and impacts negatively on pregnancy outcomes and behaviour of the child during caregiving.

1.3.2.2.3 Maternal mental health and caregiving

An association between maternal mental health and childcare practices has consistently been documented (91-100). Hurley and colleagues (92) observed that mothers who report symptoms of stress, depression and anxiety were at higher risk of being nonresponsive to the feeding needs of their children. Similarly, Dozier and colleagues (97), reported a significant association between stressful life events (e.g. financial, emotional, partner-

associated, traumatic) and shorter duration of breastfeeding and exclusive breastfeeding. Maternal stress after delivery also hinders successful breastfeeding practices (100). Two other studies observed that maternal depressive symptoms' were associated with child behaviour problems (98, 99). The preceding literature suggests that mothers' mental health plays a significant role in child caring practices, such as breastfeeding. In this regard, it is unfortunate the DHS does not collect data on maternal mental health, neither by self-reported or measured using screening instruments that have demonstrated suitability in survey research. However, as for many other factors that have important roles in the childcare model in Figure 1, a single survey project such as the DHS has limited measurement capacity. The consequence for the present research is that maternal mental health is not among the factors considered in the study of child growth and the impact of care on growth.

1.3.2.2.4 Maternal autonomy and control of resources and caregiving

In the present context, autonomy and control of resources refers to the "caregiver's (mother's) ability to play a role in decisions made within the household and the community**"**(19). UNICEF observed that women's ability to influence decision making in the household determines how resources are allocated for caring practices such as feeding, prenatal and birthing care, curative and preventive health-seeking behaviour for children (101). Furthermore, women's ability to control resources in the household has a positive effect on their own health and well-being, which in turn impacts significantly their children's survival, growth and development(101).

Similarly, studies have documented a relationship between maternal autonomy and utilization of health services (102-105), which is critical for the health and well-being of the

child. Woldemicael found in Ethiopia and Eritrea DHS data that maternal autonomy was associated with the utilization of maternal and child-care services (102). Maternal autonomy was also associated with the completion of childhood immunization in Nigeria (104, 105) and Ethiopia (103). In rural India, mothers who had higher financial autonomy were more likely to breastfeed their 3-5 months infants than mother who did not have financial autonomy (106)**.** There is also an effect of maternal autonomy on birth outcomes. For instance, Bangladeshi mothers with low decision making autonomy were at higher risk of giving birth to children with low birth weight(107). The literature in this section suggests that maternal autonomy does not only promotes the utilization of health services, its lack may have negative effects on pregnancy outcomes.

1.3.2.2.5 Maternal occupation and caregiving

Maternal occupation seems to exert strong influence over child caring practices, which in turn affects children nutritional outcomes. A study in Tanzania observed that maternal occupation was a key constraint on good child care practices(108). A similar study in India concluded that a mother's employment compromises infant feeding and care (109), particularly so when mothers are not able to get alternative caregivers. This study further reported that the compromises related to childcare and feeding outweigh the benefits from employment (109). The effect of maternal employment status on childcare boils down to the time mothers have for their children. Research has shown that mothers working away from home spend less time with their children compared to mothers who are not working outside the home (110)**.** Similar findings were obtained in China, where maternal occupation was observed to affect the time allocated for care and food preparation(111). Conversely, Bianchi and colleagues posit that the differences between the employed and non-employed are not

large, because the employed mothers tend to sacrifice their time for other activities such as housework, sleep, and leisure, to preserve time for the care of their children (112).

Other studies have suggested that maternal education has both positive and negative effects on childcare and health. According to Desai and Jain (113), a positive effect is that employment increases the mother's control over resources and this can have a positive effect on child survival and development. A negative effect is the decline in mothers' time with their children. There is also an argument that the concern regarding the possibility that mother's occupation exposes children to inferior care is misplaced. This is because most children spend several hours per day with older siblings and grandmothers (113)**.**

In terms of individual care activities, it has been found consistently that maternal occupation plays an essential role in determining child-feeding practices (114-119)**.** Gielen and colleagues (116) documented that being employed is associated with early cessation of breastfeeding. In Taiwan, a combined effect was detected of maternal employment and transcultural marriage on the continuation of breastfeeding (117)**. I**n the same study, employed mothers were found to engage in early weaning (117). Children of working mothers were also found to skip meals more often than non-working mothers(119). Additionally, in a developed economy like the US, intensity of work effort negatively affects the intensity of breastfeeding (118). It is worth noting that in workplaces where there are breastfeeding friendly policies, continuation of breastfeeding improves (120). The preceding literature suggests that maternal occupation has a significant impact on caring practices, including breastfeeding.

1.3.2.2.6 Household wealth index and caregiving

Household wealth is the term used by DHS and many other maternal and child researchers to refer to the level of material living conditions in Global South Households. The term refers not to money, gold and jewels, but rather to the quality of home construction and the availability of practical assets such as cupboards, beds and chairs, and agricultural and animal husbandry tools and equipment. The details of wealth assessment are provided in a later section.

Household wealth has both positive and negative influences on child caring practices. A number of studies have demonstrated the positive association between household wealth and breastfeeding practices (14, 121, 122). In Ghana, investigations into the determinants of exclusive breastfeeding reveal that household wealth was significantly and positively associated with exclusive breastfeeding (14). Also, Mihrshahi and colleagues, using Demographic and Health Survey data, observed that though the risk of a child not being exclusive breastfed is associated with higher socioeconomic status, mothers in the richer households were more likely to initiate early breastfeeding than those in the poorer households (121)**.** Negative influence of household wealth on breastfeeding practices has been established by other studies (123-125). In India, the likelihood of terminating breastfeeding increases with increasing household wealth status (124), and more wealth is associated with a lower likelihood of exclusive breastfeeding (121, 123)**.**

Household wealth also has influence on the use of child health care services (126-128). Using the Bangladeshi DHS data to examine the inequalities in immunization coverage, Halder and Kabir found a significant differences in immunization status between the rich and

the poor (127)**.** Other studies have also found a relationship between household wealth and the use of neonatal health care services (129, 130). In a study by Munos, rich households were more likely to use the services of a qualified health care provider for neonatal health care services (129)**.** In India, the coverage of new born and child health services is skewed in favour of the richer households (130).

Several studies have also observed a positive association between household wealth and maternal health care services usage (131-134). Findings from Ghana DHS data reveal a positive relationship between household wealth and antenatal care (ANC) attendance (133)**.** Further, the influence of ANC attendance on child caring practices is well documented (121) — mothers who attend antenatal care services are more likely to initiate early breastfeeding than those who do not attend the minimum number of services (121)**.** In the literature reviewed in this section, household wealth has both positive and negative effects on breastfeeding practices. However, expectedly, the relationship between household wealth and maternal utilization of health services is consistently positive.

1.3.2.2.7 Social support received by mother and caregiving

Social support is the support received by the mother from informal social network members such as a male partner, mother and family or friends, and professional network members (health care and related professionals) (19, 135)**.** A number of studies have demonstrated the relationship between social support and the use of child care facilities (136, 137). For example, mothers who received social support were more likely to initiate prenatal care early and also receive adequate prenatal care compared to mothers who did receive any social support(136). In the study by Dawson and colleagues (137), social support was associated

with good use of both well-child and sick-child care facilities. Social support also improves the mother's ability to engage as well as cope with childcare (138) .

Furthermore, social support is also associated with preventive health practices. Marsden and Donnelly (139) found a positive relationship between social support and immunization status. In Brazil, social support was associated with an increased chance of completing the recommended vaccination dosages for polio and DPT (140). There is also evidence on the association between social support and feeding practices (141-143)**.** A systematic review and meta-analysis, of studies from low and middle income countries, suggests that peer support increases the duration of breastfeeding among mothers in low and middle income countries (141). In Mexico, psychosocial support provided by a female companion (a 'doula') was associated with a significant increase in the frequency of exclusive breastfeeding in the month after birth (142)**.** The literature above reveals the significant role social support plays in promoting caring practices such as breastfeeding and child health services usage.

1.3.2.3. Infrastructure resources

The childcare framework in Figure 1 identifies a number of important infrastructural resources, namely, school/education, safe local drinking water, adequate sanitation and accessible healthcare. Resources relating to school/education infrastructure and accessible healthcare are beyond the scope of this dissertation, as these factors are not included in the DHS data collection.

1.3.2.3.1 Safe local drinking water

There is evidence that lack of sufficient, safe water close to home has many effects on good hygiene practices and child nutritional status (51).According to WHO estimates, 50% of under-nutrition is due to repeated diarrhea or intestinal worm infections as a result of unsafe water, inadequate sanitation or insufficient hygiene (51, 144). Even in a case where safe water is available to purchase from vendors, a limited quantity leaves little for good hygiene practices (52, 144). Thus, lack of safe water in the locality can lead to poor hygiene practices and this can result in diarrheal infections, with the consequential effect of poor nutritional outcomes (39, 145).

1.3.2.3.2 Adequate sanitation

The availability of adequate sanitation facilities has a positive impact on child health, partly due to the caregiver ability to perform good hygiene practices such as proper disposal of fecal matter. There is strong evidence that safe disposal of children's feces has a significant positive impact on child health (146). Agustina and colleagues (145) reported that children living in houses with less dirty sewage had a significantly lower diarrhea prevalence compared to those who did not have access to adequate sanitation; less diarrhea prevalence implies less prevalence of undernourishment among these children (36)**.** The importance of safe water and sanitation to human health was recognized by the United Nations Secretary General Kofi Annan in his statement on "Freedom from Want" in the Millennium Report on 03/04/00: "How can we call human beings free and equal in dignity when over a billion of them are struggling to survive on less than one dollar a day, without safe drinking water, and when half of all humanity lacks adequate sanitation…" (147).

1.3.3 Contextual factors

Now moving to the context part of the framework shown in Figure 1, this section discusses a number of subjects, which include but are not limited to religion and ethnicity, place of residence and geographic region of residence.

1.3.3.1. Religion and ethnicity

Several studies have documented the influence of religion on childcare and survival (148-152). In Mozambique, mother's association to any religious organization has been observed to have a positive effect on child survival (153). Further analysis by denomination showed that mothers' affiliation to Apostolic churches was associated with improvement in child survival (153)**.** This was also the case for mothers who were affiliated to catholic or mainstream protestant churches (153)**.**The authors speculated that the child survival benefit of being affiliated to catholic or mainstream protestant churches was due to these churches stronger connection to the health sector. For the Apostolic church, benefits could be explained by strong social ties and mutual support in Apostolic congregations (153)**.** However, a study that examined the impact of Apostolic faith on maternal and child care services usage, observed that the Apostolic faith was a significant risk factor in reducing the utilization of both maternal and child care services (149). Similarly, in Nigeria, religion increases the risk of children not being immunized (152) . Gyimah (151), using the Ghana Demographic and Health Survey (DHS) data, found that children of Muslim mothers were at higher risk of death than their Christian counterparts. This difference disappeared when socioeconomic factors were accounted for. He therefore noted that the religious variations mainly reflect difference in access to social and human capital rather than religious theology per se (151).

Furthermore, a substantial number of studies have documented a relationship between ethnicity and childcare and survival (154-159). Significant inequalities in child survival exist among ethnic groups in sub-Saharan Africa (154). Similar findings were obtained in Ghana using the DHS data ((156). Ethnicity also has an influence on the use of preventive childcare services such as immunization of children (155)**.** Additionally, the inequity in maternal health care utilization was associated with maternal ethnicity in Viet Nam (160). Studies on the influence of ethnicity on other care practices such as breastfeeding are scarce in the developing countries. However, a prominent study in this area is a longitudinal case study of child development among the Gusii people of Kenya (161). In this study, the primary goal of care among the Gusii is child survival. They are able to realize this goal through prolonged breastfeeding, "an almost exclusive interdependence of the mother-infant pair in the first year of life, and constant availability of the mother to her infant to respond to signs of distress"(161). Kounnavong and colleagues(162) found in Laos that avoidance of prelacteal feeds in the first three days of life was associated with maternal ethnic background. Sub-optimal infant breastfeeding and feeding practices are associated with ethnicity (86). In addition, a number of studies conducted in developed countries such as the USA (163, 164) and the UK (165, 166) consistently show ethnicity as a strong predictor of maternal breastfeeding practices. The literature review in this section suggests that religion and ethnicity has a significant influence on breastfeeding, child survival and use of preventive health care services, such as immunization.

1.3.3.2 Place of residence (rural-urban)

Several studies have demonstrated the influence of rural-urban place of residence on child health (167-174). Children in the rural areas are more likely than urban children to have unmet health care needs, possibly due to barriers to care such as transportation difficulties

and non-availability of health care facilities (167). In Nigeria, findings from Demographic and Health Survey (DHS) data suggest that children in the rural settings are disadvantaged both in the proportion receiving full immunization and individual vaccines (173). These inequalities were also found in India (174)**.** In a related study, urban mothers were more likely to use preventive measures against fever than were rural mothers (171)**.** Contrariwise, a study in India found the utilization of maternal and child care services to be poor in both urban and rural areas (175)**.** In South Africa, van de Hoeven and colleagues (172) observed that both urban and rural participants rated their access to health care as sufficient, even though they did not receive all the health care services they requested.

Place of residence also has influence on breastfeeding. In Viet Nam, Thu and colleagues (176) found that exclusive breastfeeding was more common in the rural areas than the urban areas. This was also the case for breastfeeding duration, where rural mothers tend to breastfeed longer than did urban mothers. However, early initiation of breastfeeding is more frequent in the urban areas compared to rural areas (176). Sparks(177) also observed similar findings, but noted that rural-urban differences in breastfeeding initiation were based on the mothers' race/ethnicity and poverty status (177). The review above reveals that urban-rural place of residence has an impact on health care services usage, both preventive and curative and breastfeeding practices: exclusive, duration and initiation.

1.3.3.3 Geographic region of residence

Studies in Nigeria, using the Demographic and Health Survey data, have shown the existence of regional (provincial) disparity in infant and child mortality (178, 179)**.** The regional disparities in child mortality boil down to the inequitable distribution of maternal

and child health care services (179). The influence of region of residence on accessibility of preventive health care services has also been documented (180-182). Mathews and colleagues (182), using the Ghana Demographic and Health Survey data, documented that region of residence was a significant determinant of immunization uptake among Ghanaian children under five years. Regional variations in vaccine uptake were also detected in Nigeria (180) and Malawi (181)**.** Region of residence also have a significant influence on child feeding practices. In Tanzania, duration of breastfeeding varies according to the geographic region of residence of the child and the mother (183). Additionally, among Bangladeshi mothers, geographic region of residence was negatively associated with duration of breastfeeding (184). From the forgoing, it is clear that region of residence is not only associated with child mortality and utilization of health care services, but also feeding practices such as breastfeeding.

The literature reviewed above helps one appreciate the significance of childcare and resources for care in promoting child growth – the availability of resources for care promotes good care practice behaviours such as utilization of preventive and curative care, better feeding practices, including responsive feeding, as well as promotes mother-to-child relationship or interaction. Yet, there are still knowledge gaps that are left to be filled. For example, the relationship between resources for care and child growth overtime is not yet well elucidated in the literature. Additionally, there is paucity of studies that examine the relationship between care practices, resources for care, and child growth simultaneously. To fill these gaps, this dissertation is set out to accomplish the objectives presented below.

1.4 Objectives of the study

1. The first objective was to examine child physical growth in relation to maternal resources and contextual factors in the period 1993 to 2008 (Paper I).

2. The second objective was to document the relationships between child dietary diversity and acute malnutrition (wasting) in urban and rural Ghana, controlling for maternal, child and household socio-demographic characteristics (Paper II).

3. The third objective focused on describing how childcare practices are associated with child growth and development (Paper III).

2. MATERIALS AND METHODS

2.1 Design, procedure and sample

This section discusses subjects such as study site, study design and data sources, and study samples. The details of these subjects are presented below.

2.1.1 Study site

The data used for this study were collected in Ghana, located in West Africa, and with a total land area of 238,537 square kilometers. It is bordered on the west by Cote d'Ivoire, on the east by Togo and on the north and northwest by Burkina Faso. Ghana's economy is mainly agricultural with crops produced for both local consumption and export. Like many economically developing countries, Ghana's population has increased rapidly over the years from 6.7 million in 1960, to 24.2 million in 2010**.** Ghana has one of the fastest growing economies in the world, but rapid population growth poses a threat to the economic progress of the country and hence her development.

There is a high rate of maternal and child/infant mortality in the country. Ghana has a maternal mortality rate of 350 per 100,000 live births. Infant mortality currently stands at 50 deaths per 1000 live births and under-five mortality stands at 80 deaths per 1000 live births (185).This high maternal and under five mortality makes it difficult, if not impossible, for Ghana to meet the MDGs 4 and 5 targets by 2015.

2.1.2 Design and data sources

This dissertation used data from the Ghana Demographic and Health Surveys (GDHS) (186)**.**The surveys were conducted in Ghana in 1993 (September to February), 1998 (November to February), 2003 (July to October) and 2008 (September to November) by the Ghana Statistical Service and the Ghana Health Service, with technical support from ICF Macro through the MEASURE DHS programme. The 1993, 1998, and 2003 surveys were funded by the United States Agency for International Development (USAID), with the government of Ghana providing funds for salaries of staff involved in the data collection. In 2008 however, many players provided financial support for the surveys: USAID and the Government of Ghana, with support from the United Nations Population Fund (UNFPA), the United Nations Children Fund (UNICEF), the Ghana AIDS Commission (GAC) and the Danish Development Agency (DANIDA).

The surveys were designed to be representative at the national, regional and rural-urban levels. The Ghana DHS employed a two-stage sampling design. The first stage involved selection of clusters from a master sampling frame constructed from the national population and housing census. The 1993 and 1998 surveys used the 1984 population and housing census as a sampling frame, while the 2003 and 2008 surveys used the 2000 population and housing census. The second stage involved the selection of households from these clusters. All women and men aged 15-49 and 15-59 respectively in the selected households were eligible to participate in the surveys. Three Questionnaires were used for the data collection: the Household Questionnaire, the Women's Questionnaire and the Men's Questionnaire. The household response rates were 98.4% in 1993, 99.1% in 1998, 98.7% in 2003, and 98.9% in 2008.

The data were collected at two levels—the household and individual levels. At the household level, information was collected on household characteristics such as source of drinking water, toilet facilities, cooking fuel, and assets of the household. At the individual level, questionnaires were administered to one eligible woman aged 15-49 per household and one eligible man aged 15-59 per household (both randomly selected in case of multiple eligible household members) to gather information on individual characteristics and health behaviours', and information on their children, with the most detailed information on the women's youngest child (the index child). To determine maternal nutritional and health status, height and weight as well as anaemia level of eligible women were measured. The weight and height of children in the household were also measured. The weight measurements were undertaken using electronic Seca scales with a digital screen, which was designed and produced under the guidance of UNICEF. Height measurements were obtained using a measuring board produced by Shorr Productions. Children younger than 24 months were measured lying down (recumbent length) on the board while standing height was measured for older children (187-190).

2.1.3 Study samples (Paper I-III)

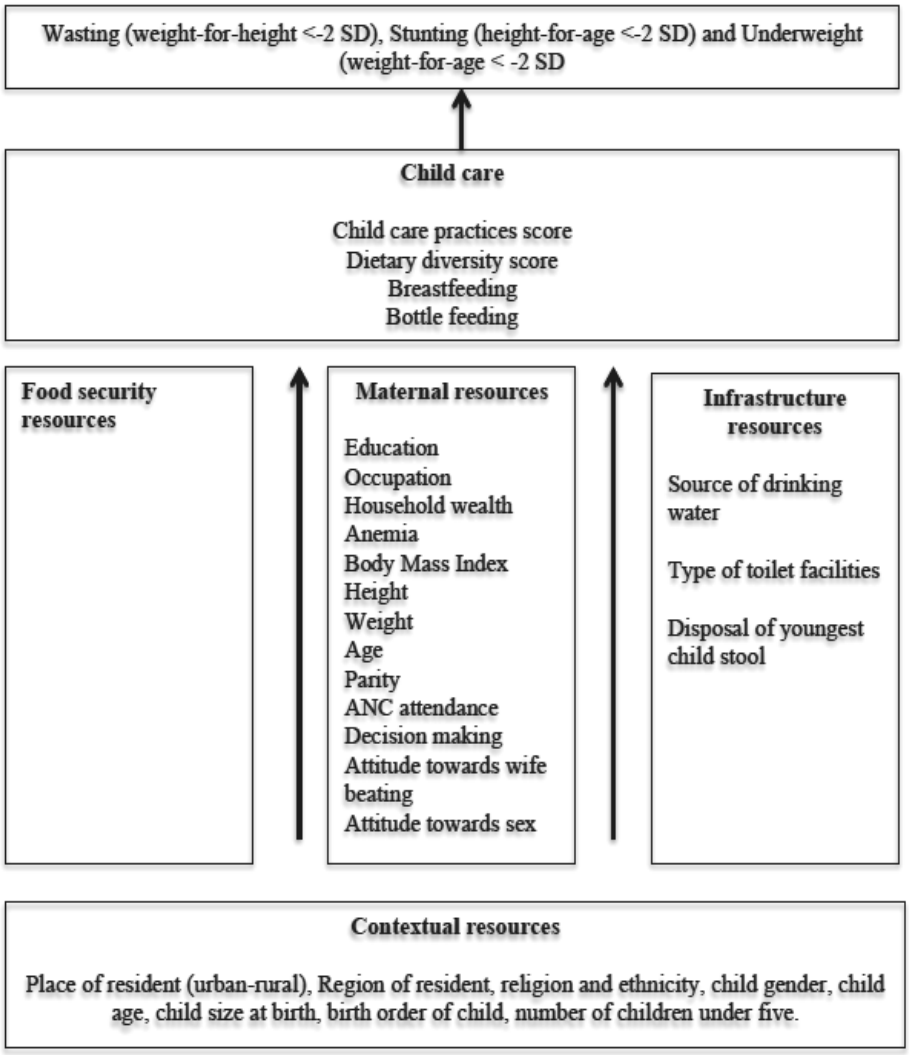
Anthropometric data (weight and length/height) were collected from children 0-59 months in the surveys conducted in 1998, 2003, and 2008, and from children 0-36 months in the 1993 survey. To make cross-year comparability possible (Paper I), we restricted our study sample to children less than 3 years old. Of 2,204 children who were part of the 1993 survey, anthropometry data were available for 1,966 (89.2%), and of the 2,067 children who were part of the 1998 survey; anthropometry data were reported for 1,778 (86.0%). In the 2003 survey, of the 2,439 children in the study anthropometry data were available for 1,933

(79.3%). In 2008, 1,904 children participated and anthropometry data were available for 1,558 (81.8%). For Papers II and III, which focus on care practices, the analysis was restricted to 6-36 months old children in the 2008 survey data. This is because in Ghana, children less than 6 months are exclusively breastfed and therefore other caring practice such as consumption of diverse diet and solid or semisolid food will not apply to them. The total sample used for the two Papers was 1187 children (393 urban and 794 rural). It is important to point out that the 2008 survey was chosen for Papers II and III based on the availability of comprehensive feeding data in these data.

2.2 Measures

The measures for this dissertation were grouped into five broad categories, based on the analytical framework employed. These categories included child nutritional status, care practices, maternal resources, infrastructural resources and contextual resources (Figure 2).

Figure 2. Analytical framework showing variables used in the analysis



2.2.1 Nutritional status (Papers I-III)

The main indicators of child growth include height-for-age, weight-for-age and weight-for-height Z-scores. Children with height-for-age, weight-for-age and weight-for-height Z-scores less than -2 standard deviations (SD) of the WHO reference population were considered stunted (chronically malnourished), underweight (composite of stunting and wasting) and wasted (acutely malnourished) respectively. In Papers I and II the indicators were dichotomized with a z-score cut-point of <-2 SD, while in Paper III the z-scores were used as continuous variable. Among the surveys, only 2008 survey used the new WHO child growth standards (187). The other surveys used the NCHS growth reference (188-190). To enable cross-survey comparisons (Paper I), we recalculated z-scores for 1993, 1998 and 2003 using the new WHO child growth standards, using a syntax provided by the WHO (191). This syntax automatically excludes all values considered biologically implausible: height-for-age z-scores less than -6.0 and greater than +6.0, weight-for-age z-scores less than -6.0 and greater than +5.0 and weight-for-height z-scores less than -5.0 and greater than +5.0.

2.2.2 Child care measures (Papers II-III)

These measures include dietary diversity score (DDS), childcare practices (CCP) score, breastfeeding and bottle-feeding. The DDS was created using data from 24-hour recall of food groups available in the 2008 Ghana DHS data set. The approach was to develop a score that included a score of 1 for each of the nutritionally important types of food the child might have eaten. The DDS was created by a simple count of food groups consumed by the child over the past 24 hours preceding the interview of the mother, who reported the child food consumption. The DDS has a range from 0 to 16, summed using these food groups: 1) gave child tinned/powder or fresh milk (yes/no); 2) gave child baby formula (yes/no); 3) gave

child baby cereal (yes/no); 4) gave child bread, rice, noodles, other made from grains (yes/no); 5) gave child potatoes, cassava, or other tubers (yes/no); 6) gave child eggs (yes/no); 7) gave child meat (beef, pork, lamb, goat, chicken etc.) (yes/no); 8) gave child dark green leafy vegetables (yes/no); 9) gave child mangoes, papayas, other vitamin A fruits(yes/no) ; 10) gave child other fruits (yes/no); 11) gave child pumpkin, carrots, squash (yellow or orange inside) (yes/no); 12) gave child liver, kidney, heart, other organs(yes/no) ; 13) gave child fish or shellfish(fresh or dried) (yes/no); 14) gave child food made from beans, peas, lentils, nuts(yes/no) ; 15) gave child oils, fats, butter, products made from them (yes/no); 16) gave child cheese, yogurt, other milk products(yes/no) . A value of 1 was given for the child's consumption (yes) of any of the food groups within 24-hours, while 0 was assigned for non-consumption (no). These scores were then summed to obtain the DDS, which was used in the analysis for Paper II as a continuous variable.

The variables used in creating the CCP were feeding practices variables and the use of preventive health services. The feeding variables were DDS, frequency of feeding solid or semi-solid food and breastfeeding status (yes = 1, no = 0). The preventive health service variables included BCG vaccination (yes = 1, no = 0), DPT, Hepatitis B, influenza 3 (yes = 1, no = 0), polio 3 (yes = 1, no = 0) and measles vaccinations (yes = 1, no = 0), iron supplementation (yes = 1, no = 0), and use of drugs for intestinal parasites (yes = 1, no = 0). The CCP was created using Principal Component Analysis (PCA) (192-194)**.** We employed the regression method, with component loadings adjusted to account for the correlations between variables, and used the oblique factor rotation procedure. Component extraction was based on eigenvalues >1, and four principal components were extracted that explained 70% of the variance. No item had a loading less than .4 (194). Therefore, all the items were

used to create the composite care practices score, treated in subsequent analyses as a continuous variable (Paper III).

2.2.3 Maternal resources (Papers I-III)

The maternal-level resources included education, occupation, household wealth, anaemia level, body mass index (BMI), height, weight, age, parity, antenatal care (ANC) attendance, decision-making, attitude towards wife beating and attitude towards sex. In this dissertation, maternal education was categorized into three groups (no education, primary and secondary or higher), while occupation was dichotomized into 'white collar' (professional/technical/managerial, clerical, sales and services) and 'agriculture/labour' (agriculture self-employed, agriculture, skilled manual labour and unskilled manual labour, household/domestic labour) (195).

The wealth index in the DHS dataset is created based on assets ownership and housing characteristics of each household: type of roofing, and flooring material, drinking water, sanitation facilities, ownership of television, bicycle, motorcycle, automobile and so on. Principal component analysis was employed to assign weights to each asset in each household. The asset scores were then summed up and individuals ranked according to the household score. The wealth index was then divided into quintiles: poorest, poorer, middle, richer and richest, and used in this dissertation as such.

Maternal BMI, height, weight and anaemia were used as indicators of maternal nutritional status and health respectively. How well-nourished or healthy a mother is can have an influence on her caregiving abilities. Anaemia was coded in the original data file as no

anaemia, mild anaemia (10.0-10.9 grams/decilitre for pregnant women and 10.0-11.9 g/dL for non-pregnant women), moderate anaemia (7.0-9.9 g/dL) and severe anaemia /less than 7.0 g/dL) (187). However, in this dissertation, anaemia level was recoded into three levels to preserve sample size: no anaemia, mild and severe/moderate anaemia.

It is important to note that maternal age and parity (number of children the mother has ever given birth to) were included as resources because it has been established that age and parity are associated with more experience in caregiving (196). In addition, number of ANC visits was identified as a resource based on the fact that mothers who attend ANC are likely to be educated on good care practices and this may improve their caregiving abilities.

The last sets of maternal resources are decision-making, attitude towards wife beating and attitude towards sex. These indices were created based on DHS recommended procedures (187)**,** to represent maternal autonomy or empowerment. For the decision making index, a score of 1 was assigned if the mother answered; respondent alone/respondent and husband/ respondent and other person to the following questions: "final say on health care", "final say on making large household purchases", "final say on making household purchases for daily needs" "final say on visit to family". All other responses were given a score of 0. The index of attitude towards wife beating was created by assigning a score of 1 to 'no' responses to the following questions "wife beating justified if she goes out without telling him", "wife beating is justified if she neglects the children", "wife beating is justified if she refuses to have sex with him", "wife beating is justified if she burns the food", and "wife beating is justified if she argues with him". In the data, 'yes' response is code 1 and 'no' response 0. However, for this index to correspond with the other indices, the responses were reverse coded such that 'no' response, which is good, will be 1 and "yes" (bad) response 0. Also,

for the attitude towards sex index, a 'yes' response to these questions was given a score of 1 and 'no' a score of 0: "reason for not having sex--husband has STI", "reason for not having sex--husband has another woman" and "reason for not have sex--tired". High scores on these indices were coded "more empowered" and low scores "less empowered".

2.2.4 Infrastructural resources (Paper III)

In this dissertation, infrastructural resources included source of drinking water, type of toilet facilities and the means of disposal of the youngest child's stools. These variables were recoded to make the analysis more meaningful. For example, source of drinking water and type of toilet facilities were recoded based on WHO and UNICEF (197) recommended classifications: "improved" water (piped, piped in dwelling, piped in yard, public tap, tube well/borehole, protected well, protected spring and rain water) and "unimproved" water (unprotected well, surface water, unprotected spring, river/dam water, tanker truck, cart with small tank, bottled water, and sachet water). The type of toilet facility was also recoded into "improved" sanitation facilities (flush toilet, flush to pipe sewage system, flush to septic tank, flush to pit latrine, flush to somewhere else, flush to don't know where, pit toilet latrine, ventilated improved pit latrine, pit latrine with slab, compositing toilet) and "unimproved" sanitation facilities (pit latrine without slab, no facility/bush/field, and bucket/pan). The disposal of the youngest child stools was recoded into "appropriate" disposal methods (always use toilet/latrine, put/rinse in toilet/latrine) and "inappropriate" disposal methods (put/rinse into drain/ditch, throw into garbage, buried, and left in the open).

2.2.5 Contextual factors (Papers I-III)

These are factors that either influence care directly or resources for care. These contextual factors include place of residence, region of residence, religion, ethnicity, child gender, child age, child size at birth, birth order of child and number of children under five years in the household. Some of these variables were recoded so as to make the findings more focused and interpretable. Region of residence was recoded into "Accra" (Greater Accra region), "South"(Western, Central, Volta and Eastern regions), "Middle"(Ashanti and Brong Ahafo regions), "Northern" (Northern region), and "Upper" (Upper East and West regions) (198)**.** Religion was categorised into two groups: "Christianity" (Catholic, Anglican, Methodist, Presbyterian, Pentecost and other Christians) the dominant religion in Ghana and "other religions" (Moslem, Traditionalist, no religion and others). Ethnicity was recoded into "Akan" (the largest ethnic group) and "other ethnicities" (Ga, Ewe, Guan, Mole, Grussi, Gruni, Mande and other). The size of child at birth as reported by the mother was collapsed into "Small or <average" (small and less than average), "Average or > average" (average and greater than average), and "Very large".

The size of child at birth was included as contextual resource because child size has an influence on the caring behaviour of the caregiver in some cultural settings (86). Additionally, child age and birth order also influence caring practices. In certain settings, children of lower birth order or younger children tend to receive more attention from the caregiver than higher birth orders and older children (199). Hence, the inclusion of age and birth order here as contextual resources. The number of children in the household is considered a contextual resource in this dissertation because it can have influence on child

care. For example, high number children in the household may lead to many children competing for limited available care, and this can affect caregiving.

2.3 Missing data

Patterns of missing data may be characterized as missing completely at random (MCAR), missing at random, also called "ignorable nonresponse" (MAR), and missing not at random or "non-ignorable" (MNAR)(193, 200, 201). In NMAR, missingness is not dependent on other variables in the dataset, but on unobserved missing value itself (200) —missingness is related to the dependent variable and therefore cannot be ignored (193). However, in the MAR, patterns of missing data are predictable from other variables and therefore can be ignored(193). In MCAR, which has been described by Tabachnich and Fedell (193) as "the best of all possible worlds if data must be missing", the distribution of missing data is unpredictable.

In this study, it is presumed that data were missing at random. This can be seen in the reasons assigned for missing anthropometric data, which are the core data for this analysis: child sick, not present, refused and mother refused (187)**.** Pullum has suggested that the bulk of missing data cases in the DHS data are due to the absence of the child from the household, rather than from the data collector's failure to carry out the measurement (202).

There are a number of ways to handle missing data in an analysis: "omitting variables which have many missing values, omitting individuals who do not have complete data, and estimating what the missing values were" (201). The employment of any of these methods

depends to some extent on the pattern of missingness (193, 201). Since it is assumed that the missingness in this study was random, and because sample sizes were reasonably large, all cases that were missing or had out of range anthropometric data were excluded case-wise. Using an anthropometry syntax provided by the WHO (191), cases that had biologically implausible anthropometry values were automatically flagged. In Papers II and III, in addition to anthropometric data, variables that did not have feeding data were not included in the creation of the dietary diversity score.

2.4 Statistical analyses

All the analyses in this thesis were performed using the statistical software package, IBM SPSS for windows version 19.0 and 21.0. Three analytical methodologies were employed: trend analysis, logistic regression analysis and multiple regression analysis.

2.4.1 Trend analysis

In the analysis for Paper I, the datasets from the five surveys were pooled. The three child growth indicators were dichotomized into stunted or not stunted, underweight or not underweight, and wasted or not wasted. To examine possible trend difference between males and females, all analyses were stratified by child's sex. The analysis involved two stages. The first stage was homogeneity analysis using cross-tabulations and the Chi square test, to ascertain the homogeneity of child under-nutrition prevalence across years and among various subgroups defined by child age, place of residence, region of residence, maternal education and household wealth. Logistic regression was used in the second stage to test for trends over time. The regression analysis was performed for stunting, underweight, and

wasting prevalence verses survey year. The Wald F Statistic was used to test the statistical significance of time trends. A trend was considered statistically significant if the p-value was less than .05. Since the DHS sampling design includes both under- and over-sampling, all analyses were conducted with sample-weighted data. The weights also accounted for non-response.

2.4.2 Logistic regression

The analysis for Paper II aimed to establish the relationship between DDS and child growth, taking into account other important resources of childcare. Two regression models were built, one each for rural and urban settings. The models tested whether the relationship between DDS and growth was significant, after accounting for resources such as breastfeeding, child sex, child birth order, maternal education, age, occupation height, BMI, parity, number of children under five years and household wealth. Interaction analysis was also conducted between DDS and (i) maternal education, (ii) occupation, (iii) BMI, (iv) child sex and (v) household wealth, for urban and rural samples separately. To account for design effect, the logistic regression was adjusted for sampling weight, strata and cluster. Multicollinearity was assessed using the variance inflation factor (VIF) (203)**.**

2.4.3 Multiple regression

The analysis for Paper III aimed to establish the relationship between CCP score and child growth. In this analysis, the general linear model (GLM) in the SPSS Complex Samples command was used, to allow adjustment for survey design effects (sample weight, strata, and cluster). The analysis produced four regression models. The first model contained

resources such as maternal age, and child age and sex. This was to examine how these resources directly affect child growth. In the second model, place of residence, number of children under five years in the household and religion were included to establish the effect of these resources on child growth. The third model introduced resources such as education, occupation, anaemia level, parity, disposal of youngest child stool, decision-making, opinion regarding wife beating, attitude towards sex, household wealth, controlling for resources in the first and second models. In the final model, CCP score was introduced, adjusting for resources in the first, second and third models. Additionally, interaction analysis was performed between the CCP score and maternal education, occupation, child sex, wealth index, and place of residence. This was particularly important because previous studies have documented that children from poorer households and/ or those of mothers with less education may be more likely to benefit more from better care practices, compared to children of wealthier households or those of mothers with better education(204).

2.5 Ethical considerations

Health research must be grounded on sound scientific and ethical standards (205). This is particularly vital in resource constraint settings where there may be a high proportion of vulnerable people due to poverty and illiteracy. In the developing countries people more often than not participate in research because of the perceived benefits the research programme brings with it (206). People in need of these benefits can easily be exploited by researchers if ethical principles are not adhered to. Recognizing the significance of protecting the rights of study participants in the developing countries, there has been a growing concern over the years about the need for more attention to ethical issues in international health research (205, 207-209). Consequently, the last two decades have

witnessed a significant increase in investment in research ethics capacity development, including the establishment of ethical review committees throughout sub-Saharan Africa, mostly supported by the USA's National Institutes of Health (210)**.** Ghana is one of the countries in sub-Saharan Africa that has benefitted from this investment. Ghana can boast of not less than six Institutional Review Boards (IRB) and Ethical Review Committees, the national one being the Ghana Health Service Ethical Review Committee (GHS-ERC). The DHS project sought and obtained the necessary ethical approvals from the GHS-ERC in Accra, Ghana. Informed consent was also obtained from participants before they were interviewed or child's weight and height was measured. For the anaemia testing, the risk and benefits of the study were explained to participants before blood samples were taken(187). The author of this dissertation did not need to seek further ethical clearance for the use of the completely anonymous dataset that was provided through his research unit at the University of Bergen.

3. RESULTS

3.1 Paper I: An analysis of socio-demographic patterns in child malnutrition trends

Paper I examined socio-demographic patterns of child malnutrition trends. The analysis at the national level showed statistically significant declining trends for stunting ($F(1, 7204) = 7.89$, $p < .005$), underweight ($F(1, 7441) = 44.87$, $p < .001$) and wasting ($F(1, 7130) = 6.19$, $p < .013$). In the analysis by sex, the declining trend in stunting was significant among only males ($F(1, 7204) = 5.79$, $p < .016$). This was also the case for wasting ($F(1, 7130) = 6.56$, $p < .010$). For underweight, the declining trends were significant for both males ($F(1, 7441) = 26.69$, $p < .001$) and females ($F(1, 7441) = 20.14$, $p < .001$). In the age-specific analysis, declining trend in stunting occurred only in the 24-35 age group, for both males and females. However, the declining trend in underweight was significant for females in the 0-5 age group and for both males and females in the 12-23 and 24-35 age groups respectively. In the regional level analysis, the declining trend in stunting was significant for only males in the northern and middle regions, while underweight trends were significant for both males and females in the middle region and only males in the northern region. In the rural/urban place of residence data, there was a stable and statistically insignificant trend in stunting for urban males and females and rural females, while the declining trend for rural males was statistically significant ($F(1, 5203) = 7.23$, $p < .007$). Analysis by maternal education show a significant increasing trends in stunting for males ($F(1, 2004) = 3.92$, $p < .048$) and females ($F(1, 2004) = 4.34$, $p < .037$) whose mothers had higher than primary education, while the trends decreased significantly for male and females whose mothers had no education. There was also a distinct narrowing of the underweight gap between children whose mothers have no education and those whose mothers have higher than primary education. Stunting exhibited significant declining trends among children in the poorest

wealth quintile, while remains static in the richest quintile. The overall finding was that overall national trends masked important departures from the trends in various socio-demographic sub-groups.

3.2 Paper II: Dietary Diversity is a Predictor of Acute Malnutrition in Rural but Not in Urban Settings

This Paper examined the relationship between dietary diversity and child growth in rural and urban settings. The logistic regression results showed that high dietary diversity score (DDS) was associated with improved growth outcomes in rural settings. A unit increase in DDS was associated with an 11% reduced odds of being wasted (OR = 0.89, 95%, C.I 0.80-0.99). In addition to DDS, maternal BMI, parity, continued breastfeeding, birth order and region of residence were significant predictors of child growth status. Low likelihood of wasting was associated with high maternal BMI, higher parity, and early birth order. Continued breastfeeding was associated with higher likelihood of wasting. There was also an interaction effect with a higher likelihood of wasting predicted by lower DDS when maternal BMI was low in the rural settings only. In the urban settings analysis, no statistically significant association was found between DDS and child growth outcomes. The only variables that were positively associated with child growth in the urban settings were maternal education, maternal BMI and household wealth. In the analysis of DDS, urban children had significantly higher DDS than rural children (6.61 ± 2.94 versus 5.57 ± 3.19, $p < 0.001$).

3.3 Paper III: influence of Childcare practices on nutritional status of Ghanaian children

This Paper examined the association between childcare practices (CCP) and growth status. The regression results in this Paper are presented in four models. In the first two models, the results show that maternal age, number of children under five years, and place of residence were positively associated with child height-for-age z-scores (HAZ), while child age was negatively associated with HAZ. In the third model, only maternal weight and household wealth index were significantly associated with child growth, after controlling for variables in the first and second models. In the last model which tested for the main effects of CCP, a statistically significant positive association was observed between CPP and HAZ after adjustment for variables in first, second and third models. A unit increase in CCP score was associated with a 0.17 unit increase in child HAZ. Only child age, number of children under 5 years and household wealth were significantly associated with child growth in the final model. To establish if some subgroups in the sample benefit less from care than others, an interaction analysis was conducted between the CCP variable and child sex, wealth index, maternal education, maternal occupation and place of residence. No significant interactions were detected.

4. DISCUSSION

The main purpose of this population based study was to investigate the relationships between childcare practices, resources for care, and child nutritional outcomes. The specific issues examined include time trends of child malnutrition spanning fifteen years, dietary diversity and child nutritional status, and finally, childcare practices and nutritional outcomes. The first part of the discussion will focus on the methods employed in the study and the second part on the main findings.

First, however, some attention to the childcare model that was used in this study is warranted. As is hopefully evident from the Papers and especially from the sections above, the child care model in Figure 1 and the analysis model in Figure 2 played central roles in this research, even if the development of theory was not an aim of the study. Empirical questions were at the heart of the study, and the model was embraced as a practical framework to organise thinking about the empirical problems, and guide the analysis and interpretation of the findings.

There is no doubt that the model had good utility in this regard. However, the model was not the subject of critical scrutiny; it was not 'tested' or challenged in any way. While such an approach to the model would be a very worthy endeavour, theory development was beyond the self-imposed 'mandate' of this study. This limitation may of course be criticised. There have been multiple opportunities to forward such criticism; when the study proposal was evaluated prior to the author's admission to the PhD programme, and when each Paper underwent peer review. However, such criticism was not raised on these occasions, presumably because reviewers understood the limited, even if vital role that the model

played in the author's approach to the overarching empirical problem: how are children growing in Ghana and how is child care related to child growth?

4.1 Discussion of methodology

4.1.1 Selection of data source

The important things to consider when selecting secondary data for analysis are the appropriateness of the data to address the research questions and the availability of key variables in the data source to conduct the study (211). These two key conditions informed the choice of the DHS data. As elaborated in 2.1.3, the inclusion of survey years was based on the availability of variables for the analysis. Similarly, after taking into account the appropriateness and availability of variables, it is also significant to consider the quality of the data. Indeed, the quality of the data would determine to some extent the validity of the findings. This was carefully investigated and the DHS data were found to be data of high quality.

Of course the DHS data are not without limitations. In the DHS, except the weight and height measurements and vaccination data from the health card, virtually all information collected is subject to reporting and recall bias (212). Information such as mother's age and children dates of birth refers to events in the past and can result in reporting biases and consequently affect the quality of the data. Nevertheless, detail examination of the DHS data has revealed that these data are reasonably well reported (202). Related to this point is the maternal recall of child diet. As noted in 4.1.3 below, maternal recall of the child diet is a cumbersome exercise and therefore could result in either under reporting or over reporting of

the child's food consumption. Another important issue related to recall bias is the maternal recall of duration of breastfeeding. Detailed examination of the DHS data reveals that mothers tend to be able to recall well for younger children (0-1) than the older ones (2-4) (202)**.**The plausible explanation is that in most cases, breastfeeding ends at 2-4 months, therefore if mothers with many children are asked to recall many durations, they could mix them up (202)**.**

Another argument for the quality of the DHS surveys relates to the use of standardized, well-tested procedures to ensure data quality (213)**.** As explained in 2.1.2, the DHS used a standardized questionnaire and equipment for the data collection. This makes cross-survey comparability possible and also maximizes validity and reliability and hence the generalizability of the findings. Nonetheless, the use of a standardized questionnaire has its own shortcomings. Standardized questionnaire limit the opportunities to adapt questioning to locally relevant conditions (212). In some localities, the responses elicited depend to some extent on how relevant the items on the questionnaire are to that locality—irrelevant items will elicit incorrect responses and this can affect the quality of the data. The DHS partly addressed this problem by not asking certain questions they consider context irrelevant. Responses to such questions are usually coded as "Not Applicable" (NA) in the data sets. This is only the case between countries but not within countries. It is worth noting that the DHS keeps on updating its questionnaire in every survey year. This may affect across survey comparability. However, the number of modification are limited in order to maintain survey comparability, limit complexity of the survey and keep the length of the questionnaire within limits (212).

Most of the limitations discussed above are unavoidable in surveys of this kind and hence they do not undermine or invalidate the utility of either the surveys or the findings in this dissertation. As Pullum (who examined the quality of the DHS surveys using data from multiple countries) summed it up in his main conclusion "…to the extent that can be ascertained without re-interviews or factual verification of specific individual-level responses, the DHS data on maternal and child health are excellent"(202)

4.1.2 Selection of nutritional indicators

As described in 2.2.1, the child nutritional status cut-points were selected based on the level of z-scores. Z-scores less than -2 standard deviations from the reference population of well-nourished children reflect undernourishment, denoted by stunting, wasting and underweight. Between 1977 and 2005, the National Centre for Health Statistics (214) child growth reference was the mainstay for assessing child nutritional status. This reference has been variously criticized as being descriptive of an untypical reference group (USA children), especially inadequate to assess child growth globally because it is based predominantly on formula-fed infants (215, 216). In fact, longitudinal studies have shown that the NCHS reference may fail to detect under-nutrition and the timing of infant and young children growth faltering (217, 218).

The shortcomings of the NCHS reference necessitated the construction of new growth standards. Consequently, the WHO in 2006 (214) came out with new child growth standards, based on healthy breastfed children living in good hygienic conditions and in diverse geographical regions: Brazil, Ghana, India, Norway, Oman and United States of America. Using data from 6 different countries allowed the development of truly international

reference (215). The new standards are prescriptive, depicting how children should grow in all countries rather than merely describing how they grew at a particular time and place (214-216)**.** Indeed, the new standards have shown to be a better tool to assess child growth (214, 217)**.** As explained in 2.2.1, in contrast to what most previous studies have done, this dissertation used the new WHO growth standards to assess nutritional status of children under-three years. Thus, this study is one of the few studies in the literature, and the first study in Ghana (to the best of author's knowledge) to have used the new growth standards to assess child growth over time (Paper I). The use of the new growth standards entailed recoding as well as recalculating the z-scores of the older data, since the existing DHS datasets cannot be combined for trend analysis. It seems the effort needed to recode older data has been a barrier to analyses using the new standards; this study shows the feasibility and the utility of making the recoding effort.

4.1.3 Creation of dietary diversity score

As described in 2.2.2, the DDS was created based on 24-hour recall of food groups consumed by the child preceding the interview. The 24 hour recall is often used to assess diet and validate other diet assessment instruments (219). This method has been employed in major national surveys such as the US National Health and Nutrition Examination Survey (NHANES), which is the only nationally representative dietary survey in the United States (220)**,** and the largest known dietary survey in the world. This goes to suggest the robustness of the 24-hour recall in assessing population dietary diversity. Apart from dietary intake, the 24-hour recall has also been employed in assessing energy intake across wide range of populations in both developed and developing countries (219, 221). This implies that the 24-hour recall method is a tool that can be used across settings. The convergence of findings

from 24-hour recall of dietary intake and of observed 24-hour intake has been previously examined. The result is that the mean nutrient estimates obtained by the use of 24-hour recall are similar to estimates obtained based on observations (222).

Yet, the 24-hour recall is not without shortcomings. The main weakness of this method is that the individual may not be able to report their food consumption accurately due to cognitive challenges such as lack of knowledge, forgetfulness and interview situations (220)**.** There is evidence that the 24-hour recall tends to underestimate food intake by about 10% relative to observed intake (223). However, cognitive challenges can be overcome by the use of probes by the interviewer, which has been well established as an effective means to identify foods that the respondent has not initially reported (220)**.** The DHS has made interviewer probing a key part of their interviewing protocols.

Another criticism of the 24-hour recall is that data generated by this method may not represent long term consumption habits of children (224)**.** The 24-hour recall is a retrospective assessment of food consumption; however, a single recall is not considered representative of habitual diet at the individual level (223-225). There have been suggestions in the literature that multiple 24-hour recalls will help to address the limitations associated with a single 24-hour recall, as this may be able to capture variations in diet (224, 225). However, this is usually not possible in a large national survey such as the DHS. The above criticisms notwithstanding, the single 24-hour recall remains the most feasible and therefore preferred method of diet measurement in large surveys, including the DHS.

4.1.4 Creation of childcare practices score

The childcare practice score was created using principal component analysis (PCA) (see 2.2.2). The PCA is a descriptive technique that can be employed in analysing both continuous and binary variables simultaneously without any statistical challenges (226). In this dissertation, information on nine care practices indicators (dietary diversity score, solid food feeding frequency, breastfeeding, BCG, DPT, polio, measles vaccinations, iron supplements and drugs for intestinal worms) was reduced with the help of PCA to a childcare practices score, which was used in the regression analysis in Paper III as a continuous variable. PCA is a robust statistical tool, which has been utilized by many researchers to construct socioeconomic indices (227, 228). However, to the best of the knowledge of the author, this is the first time a study has employed the PCA to create a childcare index for the purposes of investigating child growth. This is not to say that no study has used indexes to investigate child growth issues, but it is that these studies did not employ statistical methods to create the indices. For example, Ruel and colleagues (204) used a childcare index in their study in Ghana, but the creation of this index was based on arbitrarily assignment of scores to the various care practices. Similar methodology was used in creating a child-feeding index in a Latin American study(25). This is by no means a suggestion that these methods are inferior to method employed in the present study, but to make a point that this study is the first to employ statistical methods in creating care index in this research arena.

4.2 Discussion of results

4.2.1 Childcare practices and growth

The analyses in this dissertation show that dietary diversity is a significant predictor of child growth in rural but not in urban settings (Paper II). This association remains after household wealth and other important covariates were accounted for in the multivariate analysis. This may suggest that dietary diversity is more important in the rural areas than in urban areas. However, it is important to note that the mean DDS was greater in the urban areas than in the rural areas—some of the potential for a protective effect may have already been achieved in the urban settings. It is possible there is threshold for protection from child growth deficiency, with DDS above a certain level having diminishing effect on growth. The enthusiasm for this plausible explanation is tempered somewhat by the fact that the mean difference between the rural/urban sub-samples is a modest 1.04 on the DDS scale ranging from 0 to 16. Yet, previous studies have shown that for every increase in DDS, there is significant positive association with child growth (229)**.**

It is also worth noting that the DDS scale used in this dissertation places equal weights on all the food groups. This may introduce a bias if food group composition varies systematically by rural-urban place of resident, or if the consumption tends to occur in clusters of food groups that might also differ by rural/urban residency. This is particularly relevant because previous studies have observed that high dietary diversity may be more or less nutritionally meaningful, depending on the local diet patterns (230)**.** As pointed out by Arimond and Ruel, if many food groups are given to the child but in very small quantities, the diversity scores will have less nutritional meaning (230). Situating this in the context of the present study, although rural children are slightly disadvantaged in terms of number of food groups

consumed over 24-hours, they might have received the food groups available to them in larger quantities, hence the beneficial effect on their growth.

Relating the findings in this dissertation to other findings reported in the literature, one could observe some consistencies. In Ethiopia, a study found positive associations between dietary diversity and child growth in both urban and rural settings (229). Interestingly, in this same study, child-feeding index was associated significantly with child growth in only rural settings. Also, in Mali, the association between dietary diversity and child growth was significant in urban settings for underweight and stunting, and not for wasting (30). Indeed, this divergent mix of significant and non-significant associations observed despite different methodologies used by these studies is suggestive that dietary diversity is associated importantly with child growth, but that the underlying mechanisms are complex.

Additionally, in Paper II, the relation between breastfeeding and child growth was examined. The analysis suggests that in this population, continued breastfeeding is a risk factor for childhood wasting in rural settings, after adjusting for dietary diversity and other important covariates. Thus, children who are continually breastfed have higher risk of being wasted compared to non-breastfed children. This trend has been previously documented by other studies in sub-Saharan Africa (27, 229, 231). There could be a number of possible explanations for these associations. One has to do with the socioeconomic status of the rural population. In developing countries, not breastfeeding is associated with higher socioeconomic status (229)**.** In other words, children who are continually breastfed in the sample are likely to be children with lower socioeconomic status, and who are more prone to malnutrition. Another explanation is reverse causality (28, 232)**.** This is the hypothesis that mothers tend to prolong breastfeeding in order to meet the needs of children who are not

growing well (malnourished)—it is not increased breastfeeding that leads to poor growth, but rather children's poor growth that leads to increased breastfeeding (28, 232). This explanation fits well in the Ghanaian context, where children are often weaned based on how well they are growing or their body size. Conversely, in urban settings breastfeeding did not show any statistically significant association as either a risk factor or protective factor. The reverse of the above explanation may suffice here—urban children tend to grow better, and may therefore be weaned early.

Paper III examined how care, quantified using a composite variable (CCP) relates to child growth. The results show that CCP are associated importantly with child growth, which remained after accounting for child, maternal and household level factors. This is an indication that CCP has the potential of improving child growth status regardless of socio-demographic background of the child. This not unexpected, as UNICEF has consistently demonstrated that child growth and development does not depend only on food, but also care and health (4, 5). These three elements are all needed for a child to attain optimal growth.

The findings in this dissertation add to a small literature illuminating an inextricable link between childcare and healthy growth. A study carried in an urban area in Ghana observed that good childcare practices have the potential to mitigate the negative effect of low maternal education and poverty on child growth (204). A similar study in rural Ghana found a positive influence of childcare practices on growth (233). Conversely, both positive and negative effects on child growth were observed in a study that used a positive deviant methodology to examine the relationship between care practices and growth in Bangladeshi children (234).

Statistical interaction analysis in Paper III did not show evidence of significant interactions, suggesting that no subgroup in this study benefited less from good CCP compared to others. This is inconsistent with a previous study in urban Ghana which found that children from poorer households and/or those of mothers with less education were more likely to benefit from better care practices compared to children of wealthier households or mothers with better education (204). This inconsistent finding could be due to differences in composition of samples used by both studies. While this dissertation uses data made up of both urban and rural settings, Ruel and colleagues used data from only urban settings (204). However, in Paper II one statistically significant interaction was obtained between DDS and maternal BMI in the rural sample only. The results suggest that the DDS-growth relationship was stronger for children with lower BMI mothers compared to higher BMI mothers. This could be a reflection of the unmeasured variation in the quantity of food consumed, which is not captured by the DDS. Rural households with low dietary diversity may nonetheless have access to ample quantities of calories, reflected in higher BMI in mothers and less wasting in children. This possibility, however, could not be investigated in this dissertation, due to lack of sufficiently detailed data in the DHS on nutrient intake.

4.2.2 Maternal resources and growth

Paper I examines the relationship between child malnutrition and maternal education spanning 15 years. The results show that malnutrition is significantly decreasing among children of mothers with no formal education, while increasing among children of mothers with higher than primary education. This has resulted in the narrowing of the malnutrition gap between children of the educated and the non-educated in the country. Further analysis stratified by place of residence was performed to ensure that the effect of education was not

confounded by place of residence. Evidence of such confounding was not observed in this analysis.

These findings are unexpected because it is assumed that mothers who have high education will be more empowered to be able to take decisions on the type of nutrition and care the child should receive. Additionally, it has been demonstrated in the literature that educated mothers tend to utilize both preventive and curative health care more and consequently tend to have healthy children (58, 59, 62)**.** Educated mothers also tend to have more strongly committed attitude towards good childcare than uneducated mothers (64-66). Furthermore, the more education the mother has the more the likelihood that she is sensitive and responsive to caregiving duties(64, 66). Also, children seemingly engage more positively with their mothers when maternal education is greater (66). So, maternal education is expected to result in better child growth and development. The failure to observe effect in the present study could be explained by structural factors. One important structural factor has to do with the targeting of nutrition interventions. In Ghana, most nutrition and antipoverty interventions are targeted at populations considered disadvantaged: the non-educated and rural population (235)**.** Another plausible explanation is the recoding of the education variable. The data for this dissertation have very few people who have higher education; consequently, secondary education was collapsed with higher education. This could conceal the significance of higher maternal education as a protective factor (however, in Paper II, maternal education is associated significantly with child growth in the urban sample).

Household wealth is another important resource for care. The findings in Paper I suggest that child malnutrition trends are decreasing in the poorest wealth quintile and remaining static in the richest quintiles. These findings are surprising but may be a confirmation of the mixed

relationships between household wealth and childcare. While some studies have documented a positive association between household wealth and exclusive breastfeeding (14), others have documented a negative relationship (123-125). For instance, the likelihood of terminating breastfeeding increases with increasing household wealth status (124), as does the likelihood of exclusive breastfeeding (121, 123). From the above, one could reasonably speculate that the static trends in malnutrition in the richer households are due to worsening trend in feeding practices, while the decreasing trend in the poor households suggest improving trends in feeding practices. The declining trends among the poorest quintiles could also be due to the halving of people living below the extreme poverty line, and the significant increase in food production in Ghana between 1991 and 2008 (185, 236).

In Paper II, maternal parity, which is the number of times the mother has given birth, is a significant determinant of child growth in the rural sample but not in the urban sample, after accounting for key covariates in the regression model. An increase in maternal parity was associated with a significant decrease in childhood wasting. The finding in the rural sample is consistent with a study in Bolivia, which found that parity has a strong, independent influence on child nutritional status (237). The plausible explanation for this association could turn on childcare. Mothers who have higher parity are likely to be older women and this may bring with it valuable experience in childcare and feeding. Thus, the association with parity may have more to do with the age of the mother rather than the number of children she has had.

The results in this dissertation also reveal that maternal BMI has a significant relationship to child growth. An increase in maternal BMI, which is proxy for maternal nutritional status, is associated with a significant decrease in childhood wasting in both rural and urban settings

(Paper II). Similar relationships have been observed in Ethiopia (238) and some other sub-Saharan Africa countries (239). The association can be explained by the fact that well-nourished mothers are more likely to be healthier and therefore have more energy to be able to take good care of their children, including feeding. Poor maternal nutritional status has been demonstrated to have a deleterious effect on good childcare practices, which in turn affect child growth. Winkvist (73) observed that poor maternal health and nutritional status have the potency of limiting the mothers' ability to provide adequate care for their children, which can have an effect on optimal child survival, growth and development. This has been demonstrated in Egypt where anaemic mothers are less active caregivers compared to non-anaemic mothers(74).

4.2.3 Contextual resources and growth

In Paper I, the national level analysis suggests that child malnutrition is significantly decreasing in Ghana. This is in sharp contrast with the stagnated trends in the West African Sub-region as a whole (240)**.** Thus, Sub-regional trends cannot be used to estimate trends in countries within a region, at least not in the case of Ghana. These declining trends at the national level could be attributed to the reduction in extreme poverty in the country over the past two decades: poverty reduced from 51.7% in 1991 to 28.5% in 2006 (236, 241)**.** Also, the number of people living below the extreme poverty line in the country decreased by more than half in the last two decades. Total food production also increased significantly during this period (236)**,** thereby increasing the availability of food to the population. The declining trends in child malnutrition could also be explained by national level policies, as policies at the national level may either support or undermine families' ability to provide childcare (7)**.** An important national policy related to child nutrition in Ghana is the National

Plan of Action on Nutrition –NPAN-- (241). The key elements of the NPAN include the Baby –Friendly Health Facility Initiative, the Community Based Nutrition Behaviour Change Communication Strategy, Mother-to-Mother support groups for promoting optimal breastfeeding and complimentary feeding practices, just to mention a few. Thus, national health policy prioritizes important components of care, and the policy might therefore have had a positive influence on child caring practices in the country over the study period, thereby contributing to declining trends in child malnutrition.

The national level trends conceal important differences in the various socio-demographic segments of the country. For example, the situation at the regional level is a complete departure from the national level trends. The analysis at the regional level suggests that malnutrition declined significantly in only one region (middle), revealing that not all regions enjoyed the declining trends seen in the national level analysis. This an indication that sub-national level analyses are important for identifying regions and social groups that need better support and interventions to improve the malnutrition situation. Although there is no evidence that mothers in the Middle region are better child caregivers than mothers of the other regions, evidence of regional variations in the usage and accessibility of preventive and curative health care services has been documented previously (180-182). Also, breastfeeding in certain settings varies according to the geographic region of residence of the child and the mother (183)**.**

The analysis by urban-rural place of residence also suggests an important departure from the national level analysis. The results suggest that malnutrition trends in the rural settings declined significantly, but remained stagnant in the urban settings. This has resulted in the narrowing of the rural-urban differential gap, an observation consistent with others' findings

(242). A number of factors might have contributed to the improving trends in the rural areas, including the significant increase in food production in Ghana between 1992 and 2008 (236, 243). Since much of the food is produced in the rural areas, it stands to reason that food supplies became increasing available to rural households during this period, and when food is available in the household, it is assumed that mothers and their children, as well as others in the household, will be well fed. This implies that mothers would have better nutritional status and therefore more energy for caregiving. Another plausible explanation for the rural-urban differentials is poverty intervention targeting. In Ghana, poverty is considered to be an overwhelming rural phenomenon (244), therefore most antipoverty initiatives are directed at the rural population. However, the emphasis on the alleviation of rural poverty has led to a degree of neglect of the problems of urban poverty and urban food insecurity. Indeed, urban poverty and associated health problems are growing in Ghana (245, 246). Rural-urban differentials were revealed also in Paper II, where dietary diversity appears to be more important for child growth in the rural settings than in urban settings (discussed in detail under 4.2.1).

The age of the child is an important factor in the level of risk for malnutrition. Older children are more prone to undernourishment than the younger children (247-249). This dissertation also found higher prevalence of malnutrition among older children (Paper I). In terms of time trends, the older children exhibited significant improvement compared to younger children. The higher proportion of malnutrition among older age groups could be due to inappropriate child feeding practices and /or increased morbidity, while the declining trends may be explained by systematic improvement in the availability and quality of food (236, 243) and other care practices during this period. This empirical issue has been addressed in Paper II and Paper III, in which childcare practices are associated importantly with child

growth outcomes. Also, in Paper III, child's age has a negative relationship with malnutrition, suggesting that age is a risk factor for child under-nourishment, consistent with findings in Paper I above.

The results in this dissertation also suggest that birth order is an important factor in explaining the risk of malnutrition in rural children (Paper II). Children of higher birth order are at increased risk of being wasted compared to those of lower birth order. This is consistent with other studies which found that higher birth order is positively associated with child malnutrition (250)**.** Sommerfelt and colleagues, using multi-country DHS data, observed that stunting was rare in lower birth order children, and suggested this could be explained by the fact that parents tend to give less attention to older children when given birth to new child, who need much attention and care (199)**.** Contrary to these findings is a study done using the Ethiopia DHS. In this study, children of first birth order were at a significantly higher risk of stunting than those of higher birth order (238).This higher risk of stunting in first birth order children could be due to mothers' low level of experience with childcare at first delivery.

4.3 Strengths and limitations

This study has several strengths that should be pointed out. Among these strengths is the use of new WHO growth standards. In contrast to almost all previously published studies on child growth, this study use the new WHO growth standards to examine child malnutrition trends over a period of 15 years. To the best of author's knowledge, this the first study in Ghana to have used the new standards to investigate child growth over time. Related to this is the disaggregated analysis involved in this study. Contrary to what is common in the

literature, this study disaggregated the trend analysis to the lowest possible socio-demographic segment. There is no previous study (that the author knows of) that has performed this type of detailed sub-group analysis in Ghana.

Another important strength of the study is the use of high quality nationally representative DHS data to investigate the relationship between childcare and resources for care and child growth outcomes. This makes it possible for the findings to be generalized to the population of young children in the whole of Ghana. It is important to add that this is the first study to use a nationally representative sample to investigate the relationship between care and child health in Ghana. An additional strength is the quantification of care using statistical methods. This helps address the biases that might arise when more intuitive scoring methods are employed (as has been typical).

There are also several limitations associated with the study, already discussed in the Papers or above, but significant enough to be highlighted here. One such limitation has to do with missing data. The core data of this study come from the anthropometry measurements and birth date used to calculate the growth variables. There are myriad of reasons why useable anthropometry might be missing, discussed in detail by Pullum (202). Poor technical work by data collectors, faulty equipment, sick or uncooperative children, refusal by the mother, being away from home, and data entry errors at the time of data collection and /or in the transfer of data to analysable files, among other reasons. It is significant to note that while missing data are inevitable concern in survey research, what would be of greater concern would be a systematic pattern over the survey years wherein various reasons for missing data increased or decreased in the prevalence from survey to survey. We do not have detailed enough missing data analysis from the four surveys to evaluate the seriousness of this

potential source of bias. There is evidence that poor birth data was a (relatively minor) cause of missing growth data in all the surveys (202).

The validity of the malnutrition trends reported in this dissertation may be compromised due to method variation in determining which children were eligible for measurement. In 1993 and 1998 surveys, anthropometry measurements were restricted to children born to the women who were interviewed. Children were excluded if their mothers were not in the household, if their mothers were not eligible for the individual interview, or the mother did not complete an interview. The methodology changed in the 2003 and 2008 surveys, and children who slept in the household the night before data collection were eligible regardless of the interview status of their mother. As a result, orphans and children whose mothers were away were excluded in 1993 and 1998 and included in 2003 and 2008. This may pose a validity issue if orphans, for example, are more likely to suffer malnutrition than non-orphans in the same household. At least one study has examined this issue, comparing South African orphans and non-orphans in the same household and found no significant difference (251). Notwithstanding, the change in the sampling protocol in 2003 and 2008 is a source of concern for trend analysis such as this dissertation reports.

Another limitation has to do with the fact the data used for this dissertation are from cross sectional surveys, therefore the analyses have not been able to disentangle potential reciprocal and otherwise complex causal relationships. The conclusions in this dissertation are therefore meant to be restricted to statements about the associations between the explanatory variables and the outcome variables.

5. CONCLUSIONS AND IMPLICATIONS

5.1 Main conclusions

This study is set out to investigate child growth trends, and relationships between childcare, resources for care and child growth in Ghana. The study addresses four research questions. These questions and the corresponding conclusions are as follows:

- What are the time trends in child malnutrition prevalence in socio-demographic groups within the Ghana geographic regions? The main conclusion is that the overall national malnutrition trends have declined significantly, but this decline did not benefit all sectors of the economy, as there are static to worsening trends in some segments of the country. These worrying trends are masked by the overall positive national trends.

- What are the relationships of dietary diversity to child acute malnutrition (wasting) in urban and in rural Ghana, when control variables related to maternal, child and household characteristics are accounted for? The main conclusion is that dietary diversity has a modest but statistically significant association with acute malnutrition in rural but not in urban Ghana.

- What influence do childcare practices have on children's height-for-age z-scores (HAZ), controlling for factors at child, maternal, household and community levels? The main conclusion is that there is a statistically significant positive association between childcare practices score and child HAZ, regardless of the socio-demographic characteristics of the mother and of the household.

- Do some children in Ghana benefit more from care than do others? The main conclusion is that no socio-demographic subgroup in this study benefited more – or less -- from good care.

The conclusions on the research questions above are indications that in Ghana, childcare is vital for the promotion of child growth and development. Children who received good care had good growth. This suggests that optimizing care quality in the country could save many children from malnutrition. Resource-generating factors such as maternal BMI, birth order of child, maternal parity and rural place of residence have a significant positive association with child growth — it is prudent to conclude that promoting these resources will have beneficial effects on child growth.

5.2 Possible implications for policy

No single study can or should have a direct effect on national policy; however, this study provides information for policy makers on what type of analysis to request from Ghana agencies and institutions in the future. To be able to make an informed policy decisions, government requires subgroup analyses alongside national level analysis. This is because this study shows that national level analyses mask important departures from national trends in various segments of society.

Also of significance to policy-makers is the finding of a positive relationship between maternal nutritional status and child growth outcomes. Well-nourished mothers tend to have children with good growth status, possibly due to these mothers being able to perform

effective caregiving. This suggests positive ripple effects of a deliberate public health policy aimed at promoting maternal nutrition.

5.3 Implications for further research

This study has not been able to disentangle any causal relationships between childcare and nutritional outcome. A longitudinal cohort study design, which has the potential to disentangle these causal relationships, is warranted. The increasing trends of child malnutrition among children of mothers with higher than primary education needs further investigation. A sample with a reasonable number of people with high education could be used to investigate this issue in the future. Qualitative research at the community and policy level is warranted to elucidate what pragmatic policies are put in place and the effectiveness of these policies in stemming child under-nutrition in the country. Qualitative study at the community level could also illuminate cultural and traditional practices that positively or negatively affect childcare. Additionally, childcare is a complex practice that is impossible to characterize solely through survey research. Mixed methods studies are needed to better illuminate and provide nuanced understanding of the main conclusions reached in this study. Furthermore, the present study has observed the significance of dietary diversity for child growth. There should be a study on the influence of maternal dietary diversity on child dietary diversity. This is vital because child dietary diversity intake could be promoted by promoting maternal dietary diversity.

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RESEARCH ARTICLE Open Access

An analysis of socio-demographic patterns in child malnutrition trends using Ghana demographic and health survey data in the period 1993–2008

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Abstract

Background: A small but growing body of research indicates that progress in reducing child malnutrition is substantially uneven from place to place, even down to the district level within countries. Yet child malnutrition prevalence and trend estimates available for public health planning are mostly available only at the level of global regions and/or at country level. To support carefully targeted intervention to reduce child malnutrition, public health planners and policy-makers require access to more refined prevalence data and trend analyses than are presently available. Responding to this need in Ghana, this report presents trends in child malnutrition prevalence in socio-demographic groups within the country's geographic regions.

Methods: The study uses the Ghana Demographic and Health Surveys (GDHS) data. The GDHS are nationally representative cross-sectional surveys that have been carried out in many developing countries. These surveys constitute one of the richest sources of information currently available to examine time trends in child malnutrition. Data from four surveys were used for the analysis: 1993, 1998, 2003 and 2008.

Results: The results show statistically significant declining trends at the national level for stunting ($F(1, 7204) = 7.89$, $p \leq .005$), underweight ($F(1, 7441) = 44.87$, $p \leq .001$) and wasting ($F(1, 7130) = 6.19$, $p \leq .013$). However, analyses of the sex-specific trends revealed that the declining trends in stunting and wasting were significant among males but not among females. In contrast to the national trend, there were significantly increasing trends in stunting for males ($F(1, 2004) = 3.92$, $p \leq .048$) and females ($F(1, 2004) = 4.34$, $p \leq .037$) whose mothers had higher than primary education, while the trends decreased significantly for males and females whose mothers had no education.

Conclusions: At the national level in Ghana, child malnutrition is significantly declining. However, the aggregate national trend masks important deviations in certain socio-demographic segments, including worsening levels of malnutrition. This paper shows the importance of disaggregated analyses of national child malnutrition data, to unmask underlying geographic and socio-demographic differences.

Keywords: Malnutrition, Children under-five, Socio-demographic factors, Ghana

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Background

Child malnutrition is a long-standing and continuing public health problem in many regions of the world, despite global-level progress in the reduction of this problem during the past two decades [1]. Globally, it is estimated that childhood stunting (short stature for age) reduced from 34% to 27% and underweight from 27% to 22%, between 1990 and 2000 [1] and stunting is predicted to reduce to 22% by the next decade [2]. However, evidence shows that global estimates cannot be used to monitor progress at the regional level [3]. In Africa, the prevalence of stunting declined marginally from 40.5% in 1980 to 35.2% in 2000 [3], and between 1990 and 2010 the prevalence of childhood stunting in Africa stagnated at about 40% (2). If this trend continues, we cannot expect significant improvement in the next decade. Global estimates are not good indicators of regional trends, and it can be misleading to use regional-level data to estimate the magnitude and trend in malnutrition at the sub-regional level. During the same period when stunting decreased in North Africa, it actually increased in Eastern Africa, while Western Africa showed very little change [3].

The lesson about the limits to generalizability of large area data to smaller areas is pertinent also to intra-national demographic divisions such as urban/rural, Regions, States and Districts. In 2008 World Health Organization (WHO) estimates of the prevalence of stunting in Ghana, the urban rate was 22% while the rural rate was 33%; the Region with the lowest rate was Greater Accra with 17% while the Eastern region had the highest rate of 39%, more than two-fold difference [4].

Aside from geographic variation, child malnutrition prevalence varies substantially by socio-demographic factors such as the child's age and sex [5-8]. Therefore, in order to study trends in malnutrition at a level useful to public health planning, analyses need to be stratified by defined socio-demographic segments; overall trends may mask important departures from the general trend.

It is also vital that malnutrition be defined consistently over the time that a trend analysis is undertaken, and this has been challenging in the area of child malnutrition. The National Centre for Health Statistics (NCHS) international growth reference, that had been in use by WHO since 1978, were changed in 2006. Therefore, the published estimates before and after 2006 are not comparable, except for studies that have used the old standards also in the analysis of data generated since 2006. This strategy results in consistency [9,10].

Health ministries, as well as governmental and non-governmental health and development agencies, need access to new analyses of child malnutrition and long-term trends, that use the new WHO growth standards exclusively, and that provide disaggregated estimates for defined socio-demographic segments of the under-five population.

Turning to the socio-demographic factors that influence child under-nutrition, there is a vast theoretical and empirical literature advancing hypotheses and data on the link between socio-demographic factors and health generally and child health in particular [11-13]; a review of that literature is well beyond the scope of this paper. However, below is a detail description of various factors that might influence the nutritional status of children under five years.

Child age and gender are of such fundamental importance to the study of malnutrition time trends that they should not be ignored. Normal child growth and malnutrition are defined by WHO growth standards separately for boys and girls and for age bands separating major phases of development such as pre- and post-weaning. Yet many, if not most published studies, tend to group boys and girls and/or fail to undertake age-specific analyses. When age- and gender-specific analyses are undertaken, they show consistent differences in malnutrition prevalence that would have been masked by less-differentiated analyses [5-8].

Furthermore, a consistent finding in child malnutrition studies is that children who reside in rural areas have higher rates of stunting and underweight than those in urban areas [6-8,14,15], while the pattern for wasting is somewhat inconsistent [16]. Even when controlling for poverty level, malnutrition prevalence is always lower in urban areas [17] than in rural area. Aside from urban/rural differences, significant intra-country regional variation in child malnutrition has been documented [6,7]. In Ghana, the regions with the greatest burden of child malnutrition are those in the northern part of the country [5]. De Poel and colleagues [5] point out that the regional patterns observed in Ghana reflect ecological constraints, worse general living conditions, and poorer access to public facilities in the Northern regions. There is also an intergenerational aspect, with Northern women who suffered from malnutrition when they were children being more likely to give birth to children with low birth weight [5,18], placing such children at risk of being malnourished [19]. As for urban/rural trends, new analyses are needed to track regional time trends in malnutrition.

One of the most robust findings in the public health literature is that health is associated with socio-economic status in a graded way. Increments in household material standards (as measured for example by the Wealth Index) are associated with increments in health [20], including child nutritional status [8,21,22]. Children from wealthy households are better off compared to children from poor households. In Ghana for instance, children in the poorest households are at more than twice the risk of being stunted compared to those from the richest households [23]. Hence, prevalence and trend studies of child malnutrition should differentiate among socio-economic status groups.

Additionally, the level of maternal education is consistently, although sometimes only weakly, associated with child malnutrition [24-26].

As the time when an accounting of progress on development goals for the Global South is coming due – especially the Millennium Development Goals in 2015—planners and policy makers need reliable and valid information on child malnutrition trends that are sufficiently detailed in their socio-demographic breakdown to illuminate where goals are being met, and where challenges remain. The needed data exist, gathered in four Ghana Health and Demographic Surveys spanning 15 years from 1993 to 2008. However, these data require reanalysis, using current WHO Child Growth Standards and providing breakdowns by key socio-demographic segments.

The aims of this paper are: [1] to present findings on national child malnutrition prevalence trends in Ghana in the period 1993 to 2008; [2] to disaggregate the national level data to socio-demographic and geographic sub-groups, and [3] to compare and contrast the national level findings on malnutrition with analysis based on the sub-group.

Methods

Data sources

This study uses data from the Ghana Demographic and Health Surveys [27]. The surveys were conducted in 1993, 1998, 2003 and 2008 by the Ghana Statistical Service and Ghana Health Service, with technical and financial support from ICF Macro through the USAID-funded MEASURE DHS programme. The surveys were designed to be representative at the national, regional and rural–urban levels. A two-stage probabilistic sampling design was used to select clusters (census districts) at the first stage. The second stage involved the selection of households from these clusters. All women and men aged 15–49 in the selected households were eligible to participate in the surveys. The household response rates were 98.4% in 1993, 99.1% in 1998, 98.7% 2003, and 98.9% in 2008. The data were collected at two levels—the household and individual levels. At the household level, information was collected on household characteristics such as source of drinking water, toilet facilities, cooking fuel, and assets of the household. At the individual level, questionnaires were administered to women aged 15–49 and men aged 15–59 to gather information on individual characteristics and health behaviors, and information on children in the household.

Variables

Nutritional Status of Children

Child nutritional status was assessed by height-for-age z-scores, weight-for-height z-scores and weight-for-age z-scores using the new WHO Child Growth Standards [28]. A child was considered stunted, wasted or underweight if their height-for-age, weight-for-height or weight-for-age z-scores were further than −2 standard deviations from the median of the reference sample used to construct the WHO 2006 growth standards.

The DHS 2008 survey used the new WHO Child Growth Standards [29], while the earlier DHS surveys used the NCHS growth reference [30-32]. For the purposes of cross-survey comparability, we calculated z-scores using the new WHO Child Growth Standards, using a syntax file provided by the WHO [33]. This syntax file automatically flagged all biological implausible values. Thus, height-for-age z-scores less than −6.0 and greater than +6.0, weight-for-height z-scores less than −5.0 and greater +5.0 and weight-for-age z-scores less than −6.0 and greater than +5.0 are excluded from our analysis.

Socio-demographic variables

The socio-demographic variables included child sex and age, mother's education, urban/rural residence, region of residence and Wealth Index (composed using factor analysis to combine household-level information about housing quality and ownership/access to material goods).

Some of the variables were re-coded in order to attain reasonable sample sizes, and also based on suggestions in the literature. For maternal education, incomplete and complete primary were recoded as "Primary", and incomplete secondary, complete secondary and tertiary as "Some high school or higher". The region variable was recoded into five categories—Upper East and West regions as "Upper", Ashanti and Brong Ahafo regions as "Middle", Western, Central, Volta and Eastern regions as "South" while Greater Accra and Northern regions remained "Accra" and "Northern" respectively [34].

Data analysis

We used SPSS for windows version 19.0 to perform the data analysis. Using the definitions described above, children were classified as stunted/not stunted, wasted/not wasted and underweight/not underweight. All analyses were stratified by sex. We used the Chi Square test for homogeneity to calculate the confidence intervals for prevalence estimates, which are reported in the Tables. We used logistic regression to test the significant of trends over time. The results of these tests are given in the text only (and not in the Tables). A trend was considered statistically significant if the p-value was less than 0.05. Since the DHS sampling design includes both under- and over-sampling, all analyses were conducted with sample-weighted data. The weights also accounted for non-response. It is possible to use multi-level methods to adjust for cluster-level design effect. This should be done in analyses that are sensitive to within-census district social commonalities. We have not adjusted for the possible

design effect of cluster, due to the implausibility that census district is an important source of dependency in the child growth data. This strategy avoids over-adjustment of the analyses.

Ethics

The DHS project sought and obtained the necessary ethical approvals from ethics committees in Ghana before the surveys were carried out. Informed consent was obtained from study participants before they were allowed to participate in the surveys. The survey data sets used in this report were completely anonymous with regard to participant identity.

Results

Participation rates

Anthropometric data (weight and length/height) were collected from children 0–60 months in the surveys conducted in 1998, 2003, and 2008, and from children 0–36 months in the 1993 survey. To make cross-year comparability possible, we restricted our study sample to children less than 3 years old. Of 2,204 children who were part of the 1993 survey, anthropometry data were available for 1,966 (89.2%), and of the 2,067 children who were part of the 1998 survey, anthropometry data were reported for 1,778 (86.0%). In the 2003 survey, of the 2,439 children in the study anthropometry data were available for 1,933 (79.3%). In 2008, 1,904 children participated and anthropometry data were available for 1,558 (81.8%).

Trends in stunting (height-for-age)

Table 1 shows the national prevalence of stunting, underweight and wasting over the study period, in total and separately for males and females, and the results of Chi Square tests of homogeneity. The tests for homogeneity are statistically significant (except for the test for wasting for females), indicating that the prevalence estimates changed significantly over the years (the Chi Square tests in Tables 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16 and 17 are also tests of homogeneity). Tests for linear trends were undertaken using logistic regression; all F statistics and associated probabilities reported in this text were calculated using logistic regression. The declining trend in total stunting was statistically significant ($F(1, 7204) = 7.89$, $p \leq .005$). This was also the case for underweight ($F(1, 7441) = 44.87$, $p \leq .001$) and wasting ($F(1, 7130) = 6.19$, $p \leq .013$). However, the analyses of the sex-specific trends revealed that the declining trend in stunting was significant only among males ($F(1, 7204) = 5.79$, $p \leq .016$) as was the trend for wasting ($F(1, 7130) = 6.56$, $p \leq .010$). The declining trends in underweight were statistically significant for both males ($F(1, 7441) = 26.69$, $p \leq .001$) and females ($F(1, 7441) = 20.14$, $p \leq .001$).

In the age-specific data for stunting shown in Table 2, decline occurred primarily in the 24–35 month age group for both males ($F(1, 2171) = 15.42$, $p < .001$) and females ($F(1, 2171) = 9.91$, $p \leq .002$). The slope of the trends did not differ by sex.

In the analysis of urban/rural place of residence, shown in Table 3, there was a stable and not statistically significant trend for urban males and females and rural females, while the declining trend for rural males was statistically significant ($F(1, 5203) = 7.23$, $p \leq .007$). The decline for boys contributed to an apparent narrowing of the urban/rural gap in stunting, as shown in Figure 1.

Decomposing the analysis of stunting by regions (Table 4) revealed that the declining trends were significant for males only in the Northern region ($F(1,931) = 3.95$, $p \leq .047$) and Middle region ($F(1, 1843) = 7.19$, $p \leq .007$), and not significant for females in any of the regions.

The analyses of stunting by maternal education (Table 5) reveal a narrowing in the gap in nutritional status between various groups stratified by maternal education. This is due in part to a significantly worsening trend in stunting among males having mothers with higher than primary education ($F(1, 2004) = 3.92$, $p \leq .048$) and among females

Table 1 Prevalence and 95% confidence intervals (C.I.) in childhood malnutrition at the national level, ages 0 through 36 Months, 1993 to 2008

	1993		1998		2003		2008				
Variables	**%**	**C.I.**	**%**	**C.I.**	**%**	**C.I.**	**%**	**C.I.**	**p**	**X^2**	**Total N**
Stunting	***33,5***	***31.4, 35.6***	***25,6***	***23.5, 27.7***	***33,6***	***31.3, 35.9***	***25,7***	***23.4, 28.2***	***0,001***	***51,472***	***7205***
Male	37.2	34.3, 40.3	28.4	25.4, 31.6	37.4	34.2, 40.7	29.2	25.8, 32.9	0.001	29.422	3603
Female	29.5	26.7, 32.5	22.9	20.1, 25.8	29.8	26.8, 33.0	22.2	19.2, 25.6	0.001	23.178	3602
Underweight	***25,1***	***23.2, 27.0***	***19,8***	***17.9, 21.7***	***20.0***	***18.2, 21.9***	***15,1***	***13.3, 17.1***	***0,001***	***54,863***	***7442***
Male	27.0	24.3, 29.8	19.7	17.1, 22.5	22.6	20.0, 25.5	16.9	14.3, 20.0	0.001	30.072	3733
Female	23.1	20.5, 25.8	19.9	17.3, 22.7	17.4	15.1, 20.0	13.2	10.9, 15.8	0.001	30.582	3709
Wasting	***14,6***	***13.1, 16.2***	***13,3***	***11.7, 15.0***	***11.0***	***9.6, 12.6***	***12,4***	***10.7, 14.3***	***0.010***	***11,317***	***7131***
Male	15.5	13.4, 18.0	15.0	12.7, 17.7	11.3	9.3, 13.6	13.3	10.8, 16.3	0.051	8.741	3556
Female	13.6	11.6, 15.9	11.6	9.6, 14.0	10.7	8.9, 13.0	11.4	9.3, 14.0	0.281	4.121	3575

Table 2 Prevalence and 95% confidence intervals (C.I.) in stunting among Ghanaian children ages 0 to 36 months, by age and sex, 1993 to 2008

	1993		1998		2003		2008				
Variables	**%**	**C.I**	**%**	**C.I**	**%**	**C.I**	**%**	**C.I**	**p**	**X^2**	**Total N**
Age											
0-5											
Male	15.0	10.5, 21.0	7,5	4.4, 12.6	15,9	10.8, 22.8	9.1	4.7, 17.0	0,058	7.467	633
Female	12.8	8.8, 18.2	8.3	4.7, 14.1	11.0	6.8, 17.3	5.2	2.4, 11.0	0,139	5.486	626
6-11											
Male	16.0	11.4, 22.1	12.2	7.7, 18.7	23.7	17.3, 31.5	16.9	11.2, 24.6	0,062	7.350	635
Female	12.1	7.9, 18.1	12.8	8.4, 19.0	13.9	9.7, 19.6	11.5	6.7, 19.1	0,923	.482	673
12-23											
Male	45.4	40.1, 50.7	35.8	30.6, 41.5	43,2	37.7, 48.8	37.0	30.7, 48.8	0.040	8.320	1267
Female	32.3	27.2, 37.9	25.4	20.7, 30.8	34,2	28.8, 40.0	29.3	23.9, 35.5	0,096	6.351	1199
24-35											
Male	55.1	49.2, 60.7	40.4	34.2, 46.8	49,9	43.7, 56.0	38.4	32.0, 45.3	0,001	19.453	1068
Female	47.6	42.0, 53.3	34.5	28.8, 40.7	44,3	38.4, 50.4	29.1	23.3, 35.8	0,001	23.155	1104

having mothers with higher than primary education (F (1, 2004) = 4.34, p ≤ .037). This is illustrated in Figure 2. Stratifying the analysis by urban/rural place of residence, Table 6 shows significantly declining trends in stunting among males of mothers with no education in the rural sample (F (1, 2570) = 7.07, P ≤ .008), while females of mothers with more than primary education exhibit worsening trends (F (1, 1103) = 5.01, P ≤ .025). Males also exhibit statistical significant increasing trends in the urban sample (F (1, 900) = 5.80, P ≤ .016).

In the analyses of stunting by level of household wealth (WI), shown in Table 7, statistically significant declines were observed for females in the poorest wealth quintile (F (1, 2111) = 4.39, P ≤ .036) and for males in the poorer wealth quintile (F (1, 1559) = 5.99, p ≤ .014).

Trends in underweight (weight-for-age)

Table 9 shows the underweight prevalence estimates by age and residence. The declining trend for females in the 0–5 month age group was significant (F (1, 1347) = 7.47, p ≤ .006), as was the case in the 12–23 month age group for males (F (1, 2523) = 8.48, p ≤ .004) and for females (F (1, 2523) =5.03, p ≤ .025). The declines in underweight were also statistically significant in the 24–25 month age group, both for males (F (1, 2228) = 19.90, p ≤ .001) and females (F (1, 2228) = 12.88, p ≤ .001). The stable to worsening trends in underweight for males and females in the 6–11 month age group did not achieve statistical significance.

In the analyses of underweight by rural/urban place of residence, the declining trends were significant for rural males (F (1, 5376) = 24.22, p ≤ .001) and rural females (F (1, 5376) = 14.22, p ≤ .001), while the declining trends for urban males and females were not significant. The result was an apparent narrowing in the urban/rural underweight gap, as shown in Figure 3.

In the analyses by region (Table 10), significant declining trends were observed in the Middle region for males (F (1, 1888) = 11.99, p ≤ .001) and females (F (1, 1888) =

Table 3 Prevalence in stunting among Ghanaian children by place of residence, 0-36 Months 1993 to 2008 with 95% CI

	1993		1998		2003		2008				
	%	**C.I**	**%**	**C.I**	**%**	**C.I**	**%**	**C.I**	**p**	**X^2**	**Total N**
Residence											
Urban											
Male	26.4	21.6, 31.9	22.5	17.2, 28.8	29.5	24.2, 35.5	25.9	24.2, 35.5	0,314	3,552	1024
Female	16.6	12.5, 21.6	14.4	10.0, 20.4	22.0	16.9, 27.9	18.7	14.2, 24.4	0,142	5,452	977
Rural											
Male	41.5	37.9, 45.2	30.5	27.0, 34.3	41,5	37.6, 45.5	31.1	26.8, 35.7	0,001	29.329	2579
Female	34.4	30.9, 38.0	25.5	22.2, 29.0	33,6	30.0, 37.4	24.4	20.6, 28.7	0,001	23,658	2625

Table 4 Trends in stunting among Ghanaian children by region, 0-36 Months 1993 to 2008 with 95% CI

	1993		1998		2003		2008				
	%	C.I	%	C.I	%	C.I	%	C.I	p	X^2	Total N
Region											
Upper											
Male	36.8	27.8, 47.0	37.3	30.0, 45.2	40,9	31.7, 50.6	26.4	18.8, 35.8	0,331	3.423	550
Female	33.9	25.7, 43.3	28.5	22.0, 36.1	26,7	19.6, 35.2	35.1	25.8, 45.7	0,662	1,588	541
Middle											
Male	40.0	34.4, 45.9	28.8	22.7, 35.7	35,1	29.3, 41.3	26.4	20.5,33.4	0,006	12.533	926
Female	30.6	25.3 , 36.5	21.3	16.1, 27.7	34.0	28.2, 40.4	22.3	16.8,29.0	0,003	14.227	918
South											
Male	35.3	30.7, 40.1	27.4	22.9, 32.3	35,2	29.8, 40.9	31.5	25.7, 37.9	0,059	7.452	1312
Female	28.6	24.3, 33.2	23.5	19.5, 28.1	25.1	20.6, 30.3	23.0	18.1, 29.7	0,283	3.807	1378
Accra											
Male	22.3	15.0, 31.9	21.7	14.1, 31.8	21.9	14.1, 32.3	24.0	13.8, 38.3	0,985	.151	324
Female	14.8	8.8, 23.8	12.2	6.7, 21.3	14,2	7.9, 24.1	14.3	7.8,25.3	0,965	.272	324
Northern											
Male	50.0	40.9, 59.1	34.2	25.2, 44.6	58,9	50.7, 66.5	33.8	25.8, 43.0	0,001	19.648	491
Female	39.2	30.0, 49.2	35.9	26.0, 47.1	46,8	38.8, 55.0	20.4	13.5, 29.5	0,001	17.451	441

5.71, $p \leq .017$) and in the Northern region for males (F (1, 959) = 17.66, $p \leq .001$). The trends in the other regions did not reach statistical significance.

In the analysis of underweight by maternal education (Table 11), there was a distinct narrowing of the gap in underweight prevalence between children whose mothers have no education and those whose mothers have higher than primary education, as shown in Figure 4. This was due in part to significant declining trends for males having mothers with no education (F (1, 3104) = 18.95, $p \leq .001$) and for females having mothers with no education (F (1, 3104) =10.79, $p \leq .001$).

In the analysis of underweight by household wealth (Table 12), statistically significant declining trends were observed in the poorest wealth quintile for males (F (1, 2192) = 9.18, $p \leq .002$), in the poorer wealth quintiles for males (F (1, 1606) = 11.24, $p \leq .001$) and females (F (1, 1606) = 5.09, $p \leq .024$), in the middle quintiles for males (F (1,1390) = 10.66, $p \leq .001$) and females (F (1, 1390) = 8.50, $p \leq .004$), and in the richer quintile for females (F (1, 1230) = 4.88, $p \leq .027$).

Trends in wasting (weight-for-height)

Tables 13, 14, 15, 16 and 17 show prevalence estimates for wasting. There was a significant declining trend for males in the 12–23 month age group (F (1, 2451) = 4.31, $p \leq .038$) and in the 24–35 age group (F (1, 2451) = 9.58, $p \leq .002$). None of the other trends had significant slopes.

Table 5 Trends in stunting among Ghanaian children by maternal education, 0-36 Months 1993 to 2008 with 95% CI

	1993		1998		2003		2008				
	%	C.I	%	C.I	%	C.I	%	C.I	p	X^2	Total N
Maternal education											
No education											
Male	43.9	38.9, 48.9	32.3	27.5, 37.5	41,8	36.9, 47.0	28.6	23.1, 34.8	0,001	21.362	1502
Female	33.2	28.7, 38.1	27.4	22.9, 32.4	37,4	32.6, 42.4	19.9	15.2, 25.7	0,001	22.930	1498
Primary											
Male	35.1	31.2, 39.2	33.1	26.4, 40.5	33,9	27.4, 41.1	34.7	27.8, 42.4	0,963	.284	1125
Female	28.7	25.0, 32.8	22.3	16.5, 29.4	22.6	17.3, 29.0	24.6	18.2, 32.3	0.180	4.885	1073
Some high school+											
Male	15.3	8.1, 26.8	22.1	17.8, 27.2	34,9	29.6, 40.6	26.2	21.0, 32.1	0,001	19.950	975
Female	9.6	4.1, 21.1	19.5	15.6, 24.1	26,2	21.2, 31.8	22.7	18.3, 27.8	0.020	9.867	1030

Table 6 Trends in stunting among Ghanaian children stratified by maternal education and place of residence, 0-36 Months 1993 to 2008 with 95% CI

	1993		1998		2003		2008				
	%	C.I	%	C.I	%	C.I	%	C.I	p	X^2	Total N
Urban											
No education											
male	35.7	24.3, 49.0	33.0	21.7, 46.6	32.1	21.7, 44.6	25.4	15.5, 38.8	.69	1.60	252
female	22.0	12.6, 35.6	17.9	8.5, 33.8	35.2	22.9, 49.9	21.6	10.6, 39.1	.23	4.61	177
Primary											
male	26.1	20.2, 33.2	26.9	16.4, 40.9	22.0	13.4, 33.8	31.3	20.4, 44.7	.70	1.58	361
female	18.1	13.0, 24.7	17.5	7.9, 34.3	13.0	5.9, 26.3	24.2	14.1, 38.3	.56	2.31	310
High school+											
male	12.2	5.6, 24.7	12.2	7.3, 19.6	28.8	22.3, 36.4	22.2	15.7, 29.9	.004	14.29	496
female	8.1	2.6, 22.4	15.5	9.5, 24.2	21.4	14.3, 30.8	16.5	10.9, 24.2	.31	3.90	405
Rural											
No education											
male	43.1	37.8, 48.6	30.4	25.7, 35.5	40.8	36.1, 45.8	26.8	21.3, 33.1	.001	27.76	1467
female	39.9	31.9, 42.1	30.5	25.0, 36.5	41.5	35.5, 47.7	21.1	15.4, 28.3	.001	22.28	1104
Primary											
male	38.0	33.3, 43.1	33.1	25.9, 41.1	35.9	28.5, 44.1	32.8	25.1, 41.5	.63	1.91	842
female	35.5	30.6, 40.8	24.1	16.7, 33.5	28.7	21.5, 37.3	28.0	19.5, 38.4	.11	6.51	685
High school+											
male	20.0	5.0, 54.2	26.7	21.4, 32.8	37.0	30.1, 44.4	27.6	21.0, 35.4	.09	6.66	611
female	20.0	6.6, 47.1	21.5	16.3, 27.9	33.5	25.8, 42.1	31.3	23.8, 39.8	.06	7.52	493

Table 7 Trends in stunting among Ghanaian children by household wealth quintile, 0-36 Months 1993 to 2008 with 95% CI

	1993		1998		2003		2008				
%	%	C.I	%	C.I	%	C.I	%	C.I	p	X^2	Total N
Wealth											
Poorest											
Male	51,3	44.2, 58.4	30,8	25.2, 36.9	47,2	41.2, 53.3	32,1	25.9, 39.1	0,001	27,446	1031
Female	37,1	30.7, 44.0	29,9	24.6, 35.8	39,7	34.1, 45.7	26.0	20.3, 32.6	0,009	11,667	1081
Poorer											
Male	44.0	37.6, 50.6	24,9	18.9, 32.2	33,8	27.1, 41.1	34,1	26.7, 42.4	0,001	15,649	770
Female	28.3	22.5, 34.9	24.0	18.3, 30.9	29,4	23.5, 36.0	27,3	20.8, 34.9	0,671	1,549	790
Middle											
Male	37,7	31.4, 44.3	35,2	28.2, 43.0	41.0	33.6, 48.8	32,1	24.4, 40.8	0,376	3,103	698
Female	36,1	29.4, 43.1	24.5	18.6, 31.7	32,1	25.2, 39.9	18.3	12.1, 26.8	0,002	14,387	654
Richer											
Male	31.1	24.9, 38.0	23.0	16.8, 30.8	31,2	23.7, 39.8	20,6	14.2, 29.1	0,084	6,661	596
Female	29.2	23.3, 36.0	14,8	9.7, 21.9	23.6	16.3, 32.9	21.6	15.1, 29.8	0,016	10,285	597
Richest											
Male	18.7	13.4, 25.4	25,8	18.6, 34.7	28.5	21.3, 37.0	23.4	14.9, 34.8	0,219	4,43	508
Female	13.5	9.0, 19.9	13.9	8.3, 22.3	16.9	11.1, 24.9	12.9	7.2, 22.2	0,841	0,834	480
Total sample	**1934**		**1754**		**1992**		**1525**				**7205**

Table 8 Trends in underweight among Ghanaian children by age, 0-36 Months 1993 to 2008 with 95% CI

	1993		1998		2003		2008				
Variables	**%**	**C.I**	**%**	**C.I**	**%**	**C.I**	**%**	**C.I**	**p**	**X^2**	**Total N**
Age											
0-5											
Male	16,9	12.2, 23.0	11,8	7.6, 17.8	11.0	7.0, 16.9	9.9	6.0, 16.0	0.180	4.891	686
Female	16,9	12.3, 22.8	10.8	6.7, 16.9	7.9	4.7, 12.9	8.3	4.5, 14.6	0,026	9.269	662
6-11											
Male	22.8	17.2, 29.5	19.5	13.8, 26.9	26.4	20.0, 34.1	19.2	12.8, 27.7	0,375	3.110	648
Female	19.9	14.5, 26.7	17.4	12.1, 24.3	19.2	14.2, 25.5	14.4	9.3, 21.7	0,635	1.709	693
12-23											
Male	28.8	24.3, 33.9	23.9	19.4, 29.0	27.0	22.3, 32.2	17.8	13.2, 23.7	0,013	10.793	1298
Female	24.8	20.3, 30.1	24.0	19.5, 29.2	19,6	15.5, 24.5	16.7	12.7, 21.8	0,055	7.613	1226
24-35											
Male	33.9	28.7, 39.5	19.4	14.9, 24.8	22,3	17.7, 27.7	18.9	14.2, 24.7	0,001	22.797	1101
Female	27.2	22.5, 32.6	21.9	17.3, 27.5	18,6	14.4, 23.5	10.8	7.3, 15.7	0,001	21.961	1128

Discussion

This study examined long-term trends in child malnutrition among children less than three years of age in Ghana, by region, by rural–urban setting and by socio-economic and demographic characteristics. The findings at the national level show that overall child malnutrition is significantly decreasing. Stunting, the effect of chronic under-nutrition, declined from 33.5% in 1993 to 25.7% (23% reduction) by 2008. This is in sharp contrast with the complete stagnation of stunting trends in the West African Sub-region as a whole [2]. Thus, Sub-regional trends cannot be used to estimate trends in countries within a region, at least not in the case of Ghana. Yet, given the current trend, the rate of decline in stunting is not likely to move Ghana to the level where it will meet the WHO target of a 40% reduction by 2025 [35].

Child underweight has also declined significantly in Ghana, from 25.1% in 1993 to 15.1% in 2008, a 60% reduction. Thus, by 2008 Ghana had already achieved the Millennium Development Goal (MDGs) target of halving 1990 levels of underweight by 2015. This achievement could be attributed to significant reduction in extreme poverty in Ghana over the past two decades. For instance, overall poverty declined from 51.7% in 1991 to 28.5% in 2006 [36,37]. Similarly, the number of people living below the extreme poverty line in the country decreased by more than half in the last two decades. Total food production also increased significantly in Ghana during this period [36], essential for an increase in the availability of food to the population. Another possible explanation of the achievement made by Ghana with regard to underweight reduction is the introduction of the National Plan of Action on Nutrition (NPAN) by the Government of Ghana in 1995 [38], which aims to combat malnutrition in the country. The NPAN is multimodal, including the Baby–Friendly Health Facility Initiative, the Community Based Nutrition Behavior Change Communication (BCC) strategy, mother-to-mother support groups for promoting optimal breastfeeding and complementary feeding practices, and community-based growth promotion projects, are a few of the NPAN's key elements.

Table 9 Trends in underweight among Ghanaian children by place of residence, 0-36 Months 1993 to 2008 with 95% CI

	1993		1998		2003		2008				
	%	**C.I**	**%**	**C.I**	**%**	**C.I**	**%**	**C.I**	**p**	**X^2**	**Total N**
Residence											
Urban											
Male	18.0	13.9, 22.9	12.3	8.4, 17.5	17,3	13.2, 22.3	14.6	10.5, 20.0	0,244	4.168	1051
Female	14.3	10.6, 19.1	15.7	11.2, 21.6	9,9	6.8, 14.2	10.4	7.2, 14.7	0.120	5.826	1014
Rural											
Male	30.6	27.3, 34.0	22.4	19.3, 25.8	25,3	22.0, 28.9	18.3	14.9, 22.2	0,001	26.488	2682
Female	26.4	23.3, 29.8	21.2	18.2, 24.5	21,1	18.1, 24.4	14.9	11.9, 18.5	0,001	22,331	2695

Table 10 Trends in underweight among Ghanaian children by region, 0-36 Months 1993 to 2008 with 95% CI

	1993		1998		2003		2008				
	%	C.I	%	C.I	%	C.I	%	C.I	p	X^2	Total N
Region											
Upper											
Male	36.5	27.4, 46.5	29.0	22.5, 36.5	40.6	32.2, 49.5	23.6	15.9, 33.5	0,093	6,41	587
Female	33.3	25.2, 42.6	24.1	18.1, 31.2	21,6	15.4, 29.6	23.6	15.9, 33.6	0,257	4.044	567
Middle											
Male	24.6	19.9, 29.9	19.7	14.7, 26.0	19.0	14.6, 24.2	12.5	8.1, 18.9	0,011	11,2	947
Female	22.8	18.1, 28.3	20.6	15.5, 26.8	17,5	13.2, 22.8	12.6	8.6, 18.1	0,028	9,074	942
South											
Male	23,1	19.3, 27.4	17,7	14.0, 22.1	18,8	14.7, 23.8	18,2	13.8, 23.6	0,195	4,697	1358
Female	19.7	16.1, 23.9	19.2	15.6, 23.5	14,3	10.9, 18.6	11.5	8.2, 15.9	0,006	12.438	1411
Accra											
Male	17.0	10.7, 26.0	10.6	5.6, 19.2	13,9	7.8, 23.7	7.8	3.2, 17.8	0,278	3,852	333
Female	12.5	7.0, 21.2	11.9	6.5, 20.7	5,1	1.9, 13.0	6.5	2.7, 15.0	0,123	5.772	337
Northern											
Male	46.4	37.8, 55.6	36.5	27.2, 46.9	34,1	26.9, 42.1	23.9	17.0, 32.4	0,003	13,99	508
Female	35.7	26.9, 45.7	31.5	22.2, 42.5	32,6	25.6, 40.6	20.0	13.3, 29.0	0,067	7.151	452

The situation for wasting is not as positive as it is for stunting and underweight. Even though Ghana has made some progress in the reduction of wasting between 1993 and 2008, the national prevalence remains high at 12.4% for children less than 36 months, a level the WHO classifies as requiring urgent response [39]. Wasting, which is usually the result of acute significant food shortage and/or disease, is a strong predictor of mortality among children under-five years [18]. Hence, for Ghana to be on track to achieve MDG 4, there is a need for redoubled effort to address childhood wasting.

A number of important departures from the national trends raise cause for concern. The situation at the regional level is a complete departure from the national level. Our results show that the Middle region is the only region that exhibited significantly declining trends in stunting and underweight both for both males and females, revealing that not all regions enjoyed the declining trends seen in the national-level analyses. In terms of prevalence, the Northern and Upper regions have the highest levels of malnutrition, and this has also been documented in previous studies [5,14]. The disproportionate burden of malnutrition on children in the Northern part of Ghana may be attributable the North's high rate of poverty [36,37]. While the reduction in overall poverty at the national level between 1992 and 2006 was remarkable, the three Northern regions did not record significant poverty reduction [36,37]. Additionally, over 70% of people whose incomes are below the poverty line can be found in the Savannah areas [36,37]. The observed improvement in

Table 11 Trends in underweight among Ghanaian children by maternal education, 0-36 Months 1993 to 2008 with 95% CI

	1993		1998		2003		2008				
	%	C.I	%	C.I	%	C.I	%	C.I	p	X^2	Total N
Maternal education											
No education											
Male	36.3	31.6, 41.3	25.5	21.3, 30.4	27,8	23.6, 32.4	20.8	16.1, 26.4	0,001	20.687	1560
Female	28.8	24.5, 33.4	24.1	19.9, 29.0	23,6	19.7, 28.0	15.3	11.2, 20.4	0,002	14,97	1545
Primary											
Male	22.6	19.3, 26.2	20.0	14.7, 26.6	21,4	16.2, 27.8	16.2	11.4, 22.4	0,256	4.048	1159
Female	20.3	17.1, 24.0	17.3	12.2, 23.9	14,6	10.4, 20.1	12.4	8.3, 18.1	0,057	7,531	1097
Some high school+											
Male	9.7	4.4, 19.9	14.0	10.6, 18.4	17,8	13.8, 22.7	14.5	10.6, 19.6	0.280	3.830	1013
Female	7.4	2.8, 18.2	17.6	13.9, 22.0	12,4	9.1, 16.7	12.2	9.0, 16.3	0,047	7.941	1066

Table 12 Trends in underweight among Ghanaian children by household wealth quintile, 0-36 Months 1993 to 2008 with 95% CI

	1993		1998		2003		2008				
	%	C.I	%	C.I	%	C.I	%	C.I	p	X^2	Total N
Wealth											
Poorest											
Male	34,4	28.0, 41.4	29,3	23.9, 35.3	30,5	25.4, 36.0	20,2	15.2, 26.3	0,017	10,231	1080
Female	28,6	22.8, 35.2	25,2	20.3, 30.9	28,8	23.8, 34.4	19.0	14.2, 24.8	0,077	6,838	1113
Poorer											
Male	32,6	26.8, 39.0	16,8	11.8, 23.2	23,9	18.2, 30.8	18,9	13.0, 26.7	0,001	16,434	797
Female	29,3	23.5, 35.9	23,6	17.9, 30.5	17,5	13.0, 23.1	16,6	11.7, 23.1	0,007	12,084	810
Middle											
Male	33,9	28.0, 40.5	22,5	16.7, 29.6	22,5	16.8, 29.5	21,2	15.0, 29.2	0,009	11,491	718
Female	25,6	20.0, 32.2	15,9	11.2, 22.0	15,9	10.9, 22.5	7,7	4.0, 14.6	0,001	17,99	673
Richer											
Male	17,9	13.2, 24.0	14.0	9.2, 20.7	19,5	13.5, 27.2	10,5	6.1, 17.5	0,132	5,619	616
Female	18,8	13.9, 24.9	19,6	13.8, 27.2	10,8	6.5, 17.5	9,5	5.7, 15.5	0,017	10,186	615
Richest											
Male	12,8	8.6, 18.7	10,2	5.8, 17.3	11,2	6.8, 18.0	10,3	5.6, 18.4	0,871	0,711	522
Female	10,1	6.2, 15.8	9,8	5.4, 17.2	6,8	3.5, 12.5	8,8	4.4, 17.0	0,685	1,486	498
Total sample	**1970**		**1795**		**2062**		**1615**				**7442**

poverty statistics at the national level has not been equitably distributed. As poverty is a strong driver of malnutrition [40], sustained high poverty rates in the North translate into sustained malnutrition in the children of the North. Poverty and malnutrition are mediated by inadequate food consumption and infectious disease. Insufficient availability of food at household level due to poverty and/or improper feeding practices places children at an elevated risk of malnutrition, both directly and by malnutrition's influence on a child's susceptibility to disease and infection, and immune system dysfunction [41].

It is clear from the above discussion that the overall positive national trends mask important variation at the sub-national level. This demonstrates that sub-national level analyses are important for identifying regions and social groups that need better support and interventions to improve the malnutrition situation. Further, there is evidence that even the regional level prevalence

Table 13 Trends in wasting among Ghanaian children by age, 0-36 Months 1993 to 2008 with 95% CI

	1993		1998		2003		2008				
Variables	%	C.I	%	C.I	%	C.I	%	C.I	p	X^2	Total N
Age											
0-5											
Male	17,5	12.6, 23.8	18.1	12.5, 25.4	13.5	8.7, 20.2	19.3	12.8, 28.1	0,534	2.188	616
Female	17,3	12.5, 23.3	11.0	6.8, 17.5	18.0	12.5, 25.3	17.8	11.6, 26.2	0,333	3.407	614
6-11											
Male	22.0	16.5, 28.8	23.7	17.3, 31.7	20.0	14.1, 27.7	24.1	16.8, 33.3	0.850	.799	620
Female	18.3	13.1, 25.0	21.3	15.4, 28.7	19.2	14.1, 25.5	19.7	13.6, 27.6	0,921	.492	674
12-23											
Male	16.7	13.1, 21.1	14.4	10.8, 18.9	11.0	8.0, 15.0	12.9	8.8, 18.6	0,171	5.009	1261
Female	13.7	10.2, 18.2	12.2	8.8, 16.5	9,1	6.2, 13.3	10.9	7.6, 15.3	0,351	3.278	1191
24-35											
Male	8.8	6.0, 12.8	9.0	5.9, 13.5	6,2	3.9, 9.6	4.7	2.7, 8.2	0,179	4.903	1059
Female	8.5	5.8, 12.2	5.5	3.2, 9.2	3,5	1.9, 6.4	3.5	1.7, 7.1	0,038	8.448	1096

Table 14 Trends in wasting among Ghanaian children by place of residence, 0-36 Months 1993 to 2008 with 95% CI

	1993		1998		2003		2008				
	%	C.I	%	C.I	%	C.I	%	C.I	p	X^2	Total N
Residence											
Urban											
Male	11.6	8.3, 15.9	9.0	5.7, 13.9	8,5	5.6, 12.7	11.1	7.3, 16.6	0,549	2.115	1001
Female	8.9	6.0, 13.0	8.6	5.3, 13.7	9,4	6.4, 13.5	9.6	6.5, 13.9	0,981	.178	977
Rural											
Male	17.1	14.5, 20.1	17.2	14.4, 20.5	12,7	10.3, 15.6	14.6	11.5, 18.4	0,078	6,821	2555
Female	15.4	12.9, 18.3	12.6	10.2, 15.4	11,4	9.1, 14.2	12.6	9.8, 16.0	0,166	5,078	2598

data may mask differences in other important segments of the country [42].

Our data suggest that differentials in child malnutrition by place of residence have substantially narrowed over time in Ghana, consistent with other studies [15]. This trend in urban–rural differentials is primarily due to static trends in urban malnutrition coupled with rural improvement. A number of factors might have contributed to the improving trends in rural areas. One such factor is the significant increase in food production in Ghana between 1992 and 2008 [36,37]. Since much of the food consumed in Ghana is produced in the rural areas, it is plausible that food supplies became increasingly available to rural households during this period, and when food is available in the household, it is assumed that children will be well fed. Another possible explanation for the urban–rural differentials is that poverty is viewed in Ghana as an overwhelming rural phenomenon [43]. Therefore, most antipoverty initiatives are directed at the rural population. However, the emphasis on the alleviation of rural poverty has led to a degree of neglect of the problems of urban poverty and urban food insecurity. In fact, urban poverty and associated health problems are growing in Ghana [44,45]. The introduction of nutrition rehabilitation services and the Supplementary Feeding and Health and Nutrition Education Programmes [38], could also explain the narrowing gap between rural and urban settings. These programmes are targeted at deprived communities, mostly rural communities. These explanations are sensible, but remain merely speculative, because the possible contributory factors identified above were not measured in the surveys that provided the data for this study.

The gap in malnutrition by maternal education level has significantly narrowed in Ghana, to the extent that malnutrition rates for children of mothers who have no education are indistinguishable from children of educated

Table 15 Trends in wasting among Ghanaian children by region, 0-36 Months 1993 to 2008 with 95% CI

	1993		1998		2003		2008				
	%	C.I	%	C.I	%	C.I	%	C.I	p	X^2	Total N
Region											
Upper											
Male	26.0	18.2, 35.7	15.6	10.6, 22.3	21,3	14.4, 30.3	15.4	9.0, 25.0	0,243	4.179	546
Female	16.8	10.9, 25.2	10.9	6.9, 16.8	14,2	9.1, 21.4	18.0	11.8, 26.4	0,728	1.303	537
Middle											
Male	14.0	10.4, 18.6	14.7	10.2, 20.5	9,9	6.8, 14.2	11.9	7.5, 18.4	0,332	3,417	918
Female	14.7	10.9, 19.6	9.9	6.4, 15.1	9,6	6.5, 14.1	12.8	8.6, 18.7	0,247	4,141	913
South											
Male	12.8	9.8, 16.5	16.3	12.8, 20.8	11,1	8.0, 15.2	11.8	8.1, 16.9	0,165	5.099	1293
Female	11.2	8.4, 14.7	13.1	10.0, 16.9	11,4	8.3, 15.4	9.5	6.4, 13.8	0,508	2.326	1358
Accra											
Male	12.9	7.5, 21.4	6.1	2.6, 13.9	9,4	4.5, 18.6	9.5	3.9, 214	0,481	2.471	312
Female	5.7	2.4, 13.0	7.3	3.3, 15.4	6,9	3.3, 14.0	2.8	.70, 10.8	0,429	2.766	326
Northern											
Male	22.1	15.4, 30.7	21.2	13.9, 30.8	9,8	6.0, 15.7	20.3	13.8, 28.8	0,056	7.566	487
Female	24.2	16.6, 33.8	15.4	8.9, 25.2	12.4	8.0, 18.8	18.2	11.9, 26.7	0,125	5.732	441

Table 16 Trends in wasting among Ghanaian children by maternal education, 0-36 Months 1993 to 2008 with 95% CI

	1993		1998		2003		2008				
	%	C.I	%	C.I	%	C.I	%	C.I	p	X^2	Total N
Maternal education											
No education											
Male	20.1	16.3, 24.5	20.2	16.2, 25.0	12,7	9.7, 16.5	18.8	14.0, 24.6	0,031	8,905	1477
Female	17.8	14.3, 22.0	12.4	9.2, 16.5	12,8	9.8, 16.4	15.3	11.2, 20.6	0,153	5.267	1486
Primary											
Male	13.4	10.8, 16.6	13.4	9.0, 19.6	11,6	7.7, 17.1	10.2	6.3, 16.0	0,671	1,548	1106
Female	11.0	8.6, 14.1	12.4	8.1, 18.6	11,3	7.6, 16.6	8.4	5.2, 13.4	0,681	1,505	1066
Some high school+											
Male	6.8	2.6, 16.7	11.1	8.0, 15.2	9,7	6.8, 13.5	11.2	7.6, 16.1	0,704	1.407	972
Female	7.7	2.9, 18.8	10.6	7.8, 14.4	8,2	5.5, 11.9	10.2	7.3, 14.4	0,643	1.671	1022

ones in 2008. These differences in trends are partly due to increasing malnutrition in children of mothers with more than primary education. Further analysis stratified by place of residence was undertaken as part of this study, to examine the possibility that the effect of education is confounded by place of residence. This analysis did not provide evidence of such confounding.

The findings above are unexpected because it is assumed that mothers who have high education will be more empowered to be able to take decisions on the type of nutrition and care the child should receive. Educated mothers could also be in a better position to make informed nutritional decisions that buck unhealthy cultural norms about child feeding [46]. The puzzling failure of maternal education to have the expected effect on child nutritional status in Ghana could be due to structural factors. One such factor is intervention targeting. Most nutrition and antipoverty interventions in Ghana are targeted at the population considered disadvantaged, in this case, the non-educated and rural population [38]. This places the so-called advantaged groups, who also have pressing needs, at a disadvantage. The re-coding of the education variable could also be a plausible explanation. Our data have few people who have higher education and as a result, secondary education was collapsed with higher education. This could mask the importance of higher maternal education as a protective factor. Additionally, it is important to note that Ghana has very high unemployment rates [36,37], and

Table 17 Trends in wasting among Ghanaian children by household wealth quintile, 0-36 Months 1993 to 2008 with 95% CI

	1993		1998		2003		2008				
	%	C.I	%	C.I	%	C.I	%	C.I	p	X^2	Total N
Wealth											
Poorest											
Male	14,8	10.3, 20.7	24.0	18.9, 30.1	11,6	8.3, 16.0	13,9	9.6, 19.8	0,003	14,036	1016
Female	17,6	12.9, 23.5	14,5	10.6, 19.5	15,8	11.9, 20.7	15,9	11.6, 21.5	0,844	0,823	1075
Poorer											
Male	16,4	12.0, 21.9	13,4	8.9, 19.8	16.0	11.4, 22.1	15,1	9.6, 22.9	0,848	0,806	759
Female	18.0	13.3, 24.0	15,3	10.6, 21.6	7,8	4.8, 12.5	12,5	8.1, 18.8	0,021	9,712	777
Middle											
Male	21,5	16.5, 27.5	15,6	10.7, 22.1	9,6	6.0, 14.9	19,6	13.2, 27.9	0.010	11,348	692
Female	14.6	10.3, 20.3	8.0	4.8, 13.0	8.0	4.8, 13.1	11,5	6.5, 19.6	0.100	6,251	646
Richer											
Male	14,4	10.0, 20.1	11,4	7.0, 18.0	11,6	7.0, 18.5	9,2	5.2, 15.9	0,523	2,245	592
Female	10.3	6.7, 15.4	9,4	5.5, 15.7	9.1	5.2, 15.6	8.1	4.4, 14.3	0,891	0,624	597
Richest											
Male	9.0	5.5, 14.4	5,7	2.6, 11.8	6,5	3.2, 12.7	6.0	2.5, 13.8	0,638	1,693	497
Female	5,8	3.0, 10.8	8,7	4.5, 16.1	11,6	7.0, 18.5	6,4	2.9, 13.7	0,285	3,788	480
Total sample	**1913**		**1742**		**1957**		**1519**				**7131**

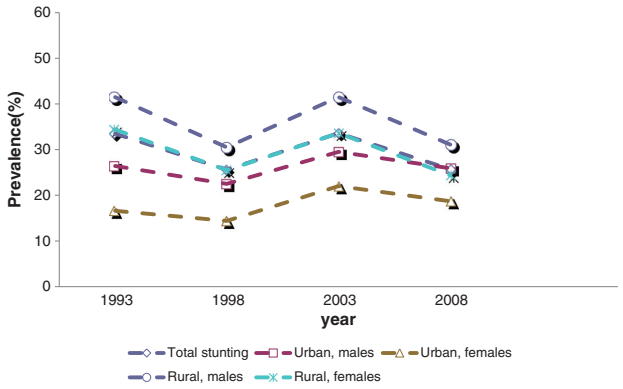

Figure 1 Stunting trends by rural/urban.

as a result most mothers with secondary education are unlikely to find a decent job to earn a living, and consequently may find it difficult to provide for the basic needs of their children.

Our data show that child malnutrition trends in the poorest wealth quintiles are decreasing while trends in the richest quintiles remain static. Even though this suggests that children in the poorest quintiles are getting better over time, malnutrition remains the bane of the poor in Ghana. The results show that malnutrition prevalence among children in the poorest wealth quintile is as much as twice that of the richest quintile. These findings corroborate earlier studies in Ghana using DHS data, which found that children in the poorest households are more than twice at risk of being malnourished compared to their counterparts in the richest households [5,23]. However, the declining trends among the poorest quintiles implies that the halving of people living below the extreme poverty line, and the significant increase in food production in Ghana between 1991 and 2008 [36,37] have helped to close the malnutrition equity gap.

The child's age is an important factor in level of risk for malnutrition. Malnutrition is more prevalent in older than in younger children [5-7]. In our data, the oldest children (24–35 months) have the highest levels of malnutrition, and the youngest age group (0–5 months) has the lowest levels. With regard to time trends, the older children exhibited significant improvement compared to the younger ones in the case of stunting. However, both younger and older age groups exhibited significant declining trends in the case of underweight. The higher proportion of malnutrition among older children could be due to inappropriate child feeding practices and/or increased morbidity, while the declining malnutrition trends may be explained by systematic improvement in the availability and quality of food [36,37] and other care practices during this period.

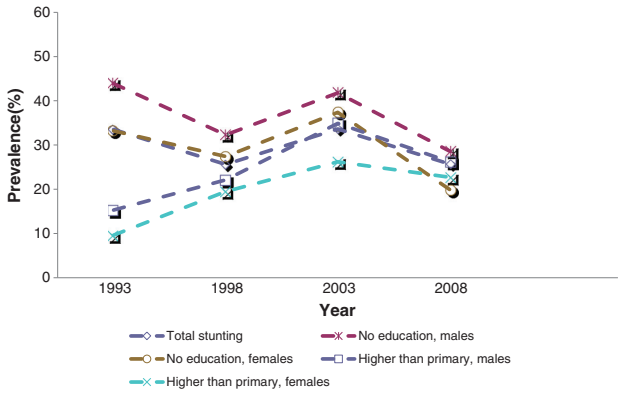

Figure 2 Stunting trends by maternal education.

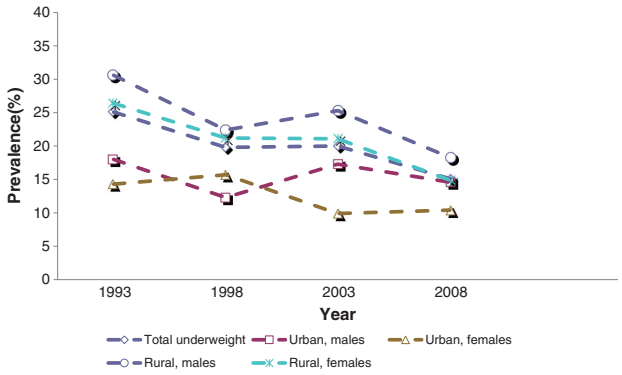

Figure 3 Underweight trends by rural/urban.

This is an empirical issue that could be addressed using the GDHS data on child care and feeding; however such analyses are beyond the scope of this paper.

There are limitations in the analysis reported in this paper. The core data of this study come from the anthropometry measurements and the birth date data used to calculate the growth variables. As reported in our results, data of sufficient quality was obtained from between 87 and 90 percent of eligible children depending on survey year. There are a myriad reasons why useable anthropometry data might be missing, discussed in detail by Pullum [47]. These include poor technical work by data collectors, faulty equipment, sick or uncooperative children, refusal by the mother or another household member, the child being away from the household during the data collection window, and data entry errors at the time of data collection and/or in the transfer of data to analyzable data files, among other reasons. While missing data is of inevitable concern in survey research, what would be of greater concern would be a systematic pattern over the survey years wherein various reasons for missing data increased or decreased in prevalence from survey to survey. We do not have detailed enough missing data analyses from the four surveys to evaluate the seriousness of this potential source of bias. There is evidence that poor birth data was a minor cause of missing growth data in all the survey.

Besides missing data, the validity of the malnutrition trends reported in this paper may be compromised due to method variation in determining which children were eligible for measurement. In 1993 and 1998 surveys, anthropometric measurements were restricted to children born to the women who were interviewed. Children were excluded if their mothers were not in the household, if their mothers were not eligible for the individual interview, or the mother did not complete an interview.

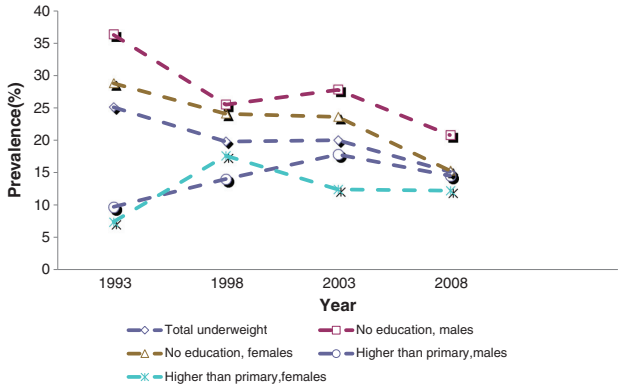

Figure 4 Underweight trends by maternal education.

The methodology changed in the 2003 and 2008 surveys, and children who slept in the household the night before data collection were eligible regardless of the interview status of their mother. As a result, orphans and children whose mothers were away were excluded in 1993 and 1998 and included in 2003 and 2008. This would pose a validity issue if orphans, for example, are more likely to suffer malnourishment than non-orphans in the same household. At least one study has examined this issue, comparing South African orphans and non-orphans in the same households [48]. There were no significant differences between the two groups on health outcomes. Nevertheless, the change in the sampling protocol in 2003 is a source of concern for trend analyses such as this paper reports.

Conclusions

The analysis at the national level shows that child malnutrition is significantly declining in Ghana. However, the aggregate national trends mask the fact that not all segments of the population benefit from improvement of the same magnitude, as our findings by various geographic and demographic characteristics reveal. There is a need for policies that address the specific constraints of households left out of progress so that children from all segments of the country benefit. Additionally, the study also found that the widened gap between rural and urban settings in Ghana is closing. While child malnutrition is progressively decreasing in the rural areas, it remains static in the urban settings. This contributed greatly to narrowing the rural/urban child malnutrition gap. In addition, the malnutrition trends by maternal education in Ghana have narrowed to the extent that the differences between the educated and non-educated are not easily distinguishable. A perplexing finding of this study is the increasing trends of childhood stunting among children of mothers who have higher than primary education, in sharp contrast with existing literature. This anomaly needs further investigation.

Competing interest

The authors declare that they have no competing interest.

Authors' contributions

DAA and MBM designed the study. DAA performed the data analysis, interpreted the results and drafted the manuscript. MBM supervised all parts of the study and contributed to the methodology and revision of the manuscript. AL contributed to the planning of the study and revision of the manuscript. All authors read and approved the final version of the manuscript.

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Dietary Diversity is a Predictor of Acute Malnutrition in Rural but Not in Urban Settings: Evidence from Ghana

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Authors' contributions

This work was carried out in collaboration between all authors. Author DAA designed the study, performed the statistical analysis, and wrote the first draft of the manuscript. Author MBM supervised all aspects of the study. Authors MBM and AL revised the manuscript. All authors read and approved the final manuscript.

Original Research Article

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ABSTRACT

Aims: To document the relationships between child dietary diversity and acute malnutrition (wasting) in urban and rural Ghana, controlling for maternal, child and household socio-demographic characteristics.
Study Design: Cross sectional survey
Place and Duration of Study: Urban and rural Ghana, between September and November 2008.
Methodology: The analysis uses data from the 2008 Ghana Demographic and Health Survey. Data on children aged 6-36 months (n = 1,187) and their mothers who provided reports of child food consumption were analysed. The mother reported the child's consumption of 16 food types/groups in the 24 hours prior to the survey. A value of 1 was assigned for each food group consumed, and these were summed to create the dietary diversity score (DDS). Logistic regression was used to investigate the relationship between DDS and childhood wasting.
Results: Among rural children, but not urban children, higher DDS was associated with a significantly lower likelihood of wasting after controlling for child, maternal, and household characteristics. A one-point increase in DDS was associated with an 11%

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reduced odds of being wasted (OR = 0.89, 95%, C.I. 0.80 - 0.99). There was also an interaction effect with a higher likelihood of wasting predicted by lower DDS when maternal BMI was low.
Conclusion: Dietary diversity has a modest but statistically significant association with acute malnutrition in rural but not in urban Ghana. Interventions to combat acute malnutrition in rural settings should include efforts to promote the consumption of a variety of food groups.

Keywords: Dietary diversity; nutritional status; wasting; urban-rural; Ghana.

1. INTRODUCTION

Lack of dietary diversity is a problem at any age, but it is particularly critical for older infants and young children during the complementary feeding period, who need food containing essential nutrients for normal physical and mental development. Those who eat foods from four or more food groups daily have the minimum recommended dietary diversity, under the assumption that they consume at least one animal-source food and at least one fruit or vegetable, in addition to a staple food [1]. However, for many children, this minimum is not achieved, particularly among poor households, where starchy staples are the mainstay. Older infants and young children in sub-Saharan Africa subsist typically on gruel and porridge, accompanied with seasonal vegetables and legumes, and few or no animal products [2,3,4,5]. The monotony of diet that is a hallmark of poverty is not just dreary; it results in poor nutrition and health [6].

Recognizing the importance of dietary diversity for child growth and development, the World Health Organization (WHO) has recently included dietary diversity as a specific recommendation in the updated guidelines for complementary feeding of breastfed children aged 6 to 23 months [1]. The increased recognition of dietary diversity as an important element in healthy nutrition calls for more research in this area.

The relationship between the concepts ‘food security’ and ‘dietary diversity’ is close. Food security refers to a state of not living in hunger and not risking severe deficiency in energy and nutrient intake [7,8]. Studies from South America and Africa show that dietary diversity is positively associated with young children’s intake of energy and key nutrients and the avoidance of food insecurity [2,4,9,10,11,12,13]. Dietary diversity could therefore be a reasonably good indicator of food security, and relatively easy to measure at both the individual and household levels [7].

While dietary diversity is expected to contribute to good child health as reflected by good child growth, other factors are also at play. Alongside poor nutrition, inadequate hygiene, living conditions, income and medical care can lead to otherwise preventable infection and disease [14]. Thus, when stunting, wasting and underweight are observed, the causes are likely to be multiple and interdependent. This raises a critical point: the state of a child’s health is often a result of the interactions of factors at the individual and family levels such as access to food, feeding patterns, and factors at the social and physical environmental levels, such as access to health care and to clean water.

A further consideration is that there tends to be a socio-geographic clustering of risk factors for poor health. Rural living conditions and their association with relatively poor health (in comparison to urban living conditions and health) have given rise to rural health as a

research arena in its own right [15]. This is not to deny the fact that urban environments may pose threats to health that are less salient in rural environments. The point, rather, is that rural and urban living environments tend to place different kinds of demands on their inhabitants and offer different kinds of resources to cope with demands.

While life may be arduous wherever one resides, the difficulties tend to be patterned on a rural/urban dimension. Rural children tend to be comparatively poorer than urban children and socioeconomic status is strongly associated with health [16]. Overall, living standards and health in general are poorer in rural than in urban children in African countries [17]. This tends to be true also for child nutritional status in many developing countries [18,19, 20].

Of course, health is variable *within* rural and *within* urban children, and the degree to which the geographical environment affects health is somewhat dependent on individual differences such as income, education, gender, race, ethnic group [21]. As already implied, there is strong evidence that environmental factors interact with individual factors to affect health. For example, the gap in child health between the richest and the poorest households is greater in urban than in rural children [19].

Some studies have examined the association between dietary diversity and child health, attempting to take into account the different child-rearing contexts in urban compared to rural living. Findings are inconsistent. While analysis of Ethiopia Demographic and Health Surveys shows that dietary diversity is positively associated with child stunting in both urban and rural children [11], Hatloy and colleagues found in Mali that the association was only significant in urban children, and then only for underweight and stunting, but not for wasting [22]. Perhaps the most encompassing studies of urban/rural differences in child malnutrition in Sub-Saharan Africa are those of Fotso [23,24], undertaken in 15 countries with Demographic and Health Surveys (DHS) data. With stunting as the indicator of malnutrition, he observed higher levels of socioeconomic inequalities in stunting in urban than in rural children [23]. Across the 15 countries, stunting was more prevalent in rural than in urban children, but the differences were minimal after adjustment for socio-economic status (SES) [24]. In contrast to Fosto's conclusion that urban/rural gaps in stunting are accounted for by SES differences, many other studies using DHS and other datasets have observed that differences across rural and urban children persist after controlling for SES and other important covariates [18,19,25,26,27]. It is noteworthy that many dietary diversity studies have not examined urban/rural differences in malnutrition [2,4,9,10,11,12,13], perhaps in concert with the DHS, which never reports inter-country urban/rural comparisons due to varying definitions of urbanity/rurality from country-to-country.

Thus, much remains to be understood about urban and rural patterns in child dietary diversity, its relationship with stunting, wasting and underweight, and the role played by other factors such as living conditions. The lessons from the literature are that cross-country comparisons are fraught with methodological difficulties, that interactions between individual and environmental factors should be accounted for, and that newer analyses are needed, using up-to-date definitions of stunting, wasting and overweight.

This paper presents an analysis specific to Ghana, using the latest available data (GDHS, 2008) and malnutrition definitions, and conducting separate but comparable analyses for urban and rural settings. The study question was 'what are the relationships of dietary diversity to childhood wasting in urban and in rural Ghana, when control variables related to maternal, child and household characteristics are accounted for?

2. MATERIALS AND METHODS

2.1 Source of Data

This study used a nationally representative dataset from Demographic and Health Surveys (DHS) carried out in Ghana in 2008 [28]. These are publicly available data. The choice of 2008 data set was informed by the fact that they were the most recent data available, and most importantly, they contain the necessary child feeding variables needed for this analysis. The Ghana DHS 2008 was collected by the Ghana Statistics Services (GSS) and Ghana Health Service (GHS) with technical assistance from ICF Macro, using the Ghana 2000 population census as the sampling frame. The surveys were designed to be representative at the national, regional and rural–urban levels. A two-stage probabilistic sampling design was used to select clusters (census districts) at the first stage. The second stage involved the selection of households from these clusters. All women and men aged 15–49 and 15-59 respectively in the selected households were eligible to participate in the surveys. The household response rate was 98.9% [29]. The ICF Macro Institutional Review Board (IRB) in Calverton, Maryland, USA and the Ghana Health Service Ethical Review Committee in Accra, Ghana (GHS-ERC) granted ethical clearance of the 2008 Ghana project. No further ethical clearance was required by the authors of this paper for the use of the completely anonymous dataset.

2.2 Study Sample

The total number of children aged 0-59 months in the 2008 was 2,992 and this analysis was restricted to the children aged 6-36 months (n =1,411). Two hundred and twenty-four children (15.9%) were excluded from the analysis who were missing anthropometric data or who had biologically implausible values (weight-for-height z-scores less than −5.0 and greater +5.0). The total sample in the descriptive analyses and in the regression analyses was 1,187 (393 urban and 794 rural children).

2.3 Measurements/Variables

2.3.1 Creation of dietary diversity score

A dietary diversity score (DDS) was created using data from 24-hour recall of food types/groups available in Ghana DHS data set. The DDS is a count of the number of food groups consumed by the child over the past 24 hours preceding the DHS interview of the mother, who reported the child's food consumption. The DDS has a range from 0 to 16, summed using these food groups: 1) tinned/powder or fresh milk; 2) baby formula; 3) baby cereal; 4) bread, rice, noodles, other made from grains; 5) potatoes, cassava, or other tubers; 6) eggs; 7) meat (beef, pork, lamb, goat, chicken etc.); 8) dark green leafy vegetables; 9) mangoes, papayas, other vitamin A fruits; 10) other fruits; 11) pumpkin, carrots, squash (yellow or orange inside); 12) liver, kidney, heart, other organs; 13) fish or shellfish(fresh or dried); 14) food made from beans, peas, lentils, nuts; 15) oils, fats, butter, products made from them; 16) cheese, yogurt, other milk products. A value of 1 was assigned for each of the nutritionally important types of food the child might have eaten. Details of the variables can be found in Table 1. The DDS was analysed as a continuous variable.

Table 1. Characteristics of variables used in creating the dietary diversity score for children 6-36 months old (n = 1187)

Variables	Total	Urban	Rural	*P*
	%	%	%	
Gave child tinned/powder or fresh milk	19.2	34.1	11.8	0.001
Gave child baby formula	5.6	9.5	3.7	0.001
Gave child baby cereal	9.0	19.4	3.9	0.001
Gave child bread, rice, noodles, other made from grains	75.0	79.1	73.0	0.020
Gave child potatoes, cassava, or other tubers	44.7	37.9	48.0	0.001
Gave child eggs	22.0	31.3	17.0	0.001
Gave child meat (beef, pork, lamb, goat, chicken, etc.)	19.1	29.8	13.9	0.001
Gave child pumpkin, carrots, squash (yellow or orange inside	11.6	13.2	10.8	0.230
Gave child any dark green leafy vegetables	42.3	35.1	45.8	0.001
Gave child mangoes, papayas, other vitamin A fruits	8.7	8.4	8.8	0.800
Gave child any other fruits	53.3	58.5	50.7	0.010
Gave child liver, kidney, heart, other organs	7.4	10.7	5.8	0.002
Gave child fish or shellfish (fresh or dried)	56.5	59.5	55.1	0.140
Gave child food made from beans, peas, lentils, nuts	22.7	21.6	23.2	0.540
Gave child cheese, yogurt, other milk products	7.6	13.8	4.5	0.001
Gave child oil, fats, butter, products made of them	44.0	52.2	39.9	0.001

**Food types consumed by the children over 24 hour period.*

2.4 Urban/Rural Designation

The DHS uses the definition of urban and rural location provided by the country being surveyed. In Ghana, the definition is set by the Ministry of Health and published by the Ghana Statistical Services in various official documents. A locality is a distinct population cluster which has a name or locally recognized status. Localities with a population of 5000 or more persons are classified as urban, while those with less than 5000 are classified as rural [30]. An important methodological note is that valid urban/rural comparisons between countries are not possible using DHS data, as definitions of urban and rural vary from country to country (and in some countries, from time to time).

2.4.1Outcome variables

The main indicators of child nutritional status include height-for-age, weight-for-age, and weight-for-height z-scores. Children with height-for-age, weight-for-age and weight-for-height z-scores less than -2 standard deviations (SD) of the WHO reference population were considered stunted, underweight and wasted (acutely malnourished), respectfully. The logistic regression analysis focused on weight-for-height (W/H) dichotomized with the cut-point W/H < -2 SD. Of the three indicators of child nutritional status, only W/H was associated significantly with DDS in bivariate analyses. Therefore, multivariate analyses were restricted to the outcome variable, W/H.

2.4.2 Other variables

A number of socio-economic variables were included in the regression analyses: maternal education, occupation and household Wealth Index. Maternal occupation was dichotomized into 'white collar' (professional/technical/managerial, clerical, sales and services) and 'agriculture/labour' (agriculture self-employed, agriculture, skilled manual labour and unskilled manual labour, household/domestic labour) [31]. Education was grouped into three categories (no education, primary, and secondary+). The Wealth Index in the DHS is based on assets ownership and housing characteristics of each household: type of roofing, and flooring material, drinking water, sanitation facilities, ownership of television, bicycle, motorcycle, car and so on. Principal component analysis was employed to assign weights to each asset in each household. The asset scores were then summed up and all individuals in a household were assigned the household Wealth Index score. The Wealth Index was then divided into quintiles: poorest, poorer, middle, richer and richest. These quintiles were used in our analysis.

Another important variable included in the analysis was the region variable. This variable was recoded into five categories namely, “Accra”, “South” (Western, Central, Volta, and Eastern regions), “Middle” (Ashanti and Brong Ahafo regions), “Northern (Northern region), and “Upper” (Upper East and Upper West regions) [32].

The following variables were also used in the analysis to account for maternal and child level characteristics which may have influence on the nutritional status of the child as well confound the dietary diversity score: maternal age, BMI, height, parity, anaemia level, size of child at birth, continued breastfeeding, use of feeding bottle, sex of child, birth order of child, and number of children under five years in the household. Some of these variables were recoded. Anaemia levels (an indication of maternal nutritional and health status) as defined by DHS [29] were coded into four categories: no anaemia, mild anaemia (10.0-10.9 grams/decilitre for pregnant women and 10.0-11.9 g/dL for non-pregnant women), moderate anaemia (7.0-9.9 g/dL), and severe anaemia (less than 7.0 g/dL). Size of child at birth as reported by the mother was collapsed into “Small or <average” (small and less than average), “Average or > average” (average and greater than average), and “Very large”. In addition, in the data, a yes response is coded “1” and no “0”, however, the response to the use of feeding bottle was recoded into yes= “0” and no = “1”. This is because the use of bottle feeding as a feeding method is considered detrimental to children at all ages, because of potential interference of bottle feeding with optimal breastfeeding practices and the association between bottle feeding and increased diarrheal disease morbidity and mortality [1].

2.5 Data Analysis Methods

The data analysis was performed using SPSS for windows, version 19.0. The analysis involved three stages. The first stage was descriptive analysis to provide general information on the characteristics of the sample. Differences in means between urban and rural for continuous variables were tested using independent samples t test and proportions tested using chi square test. These were followed by bivariate analysis of the associations between the DDS and the main indicators of child malnutrition: wasting, underweight and stunting. Associations were considered statistical significant at P-values < 0.05. Significant associations were subjected to further analysis. Wasting was the only variable that was significantly associated with dietary diversity, so further analyses were not carried out on

stunting and underweight. All the above analyses took into account survey design effects (analyses adjusted for sampling weight, strata and cluster).

Multivariate methods were used to test whether associations between DDS and wasting remained significant after taking into account other potential predictors of wasting at the child level (breastfeeding status, sex, birth order), maternal level (education, age, occupation, height, BMI, parity) and household level (wealth index, number of children under five years, region). Two analyses were carried out separately for urban and rural children. To account for survey design effect, logistic regression was adjusted for sampling weight, strata and cluster. Multicollinearity was assessed but not observed [33].

In the UNICEF child health conceptual framework, diet is among the three most proximal factors influencing child nutritional status, the other two being home care and health care [14]. The framework does not address the potential effect modifying influence of rural versus urban living, but the empirical literature cited above suggests that the urban-rural dimension carries with it a host of contextual factors that may influence child diet in particular and child care more generally. Therefore the analytical strategy of this paper was to undertake stratified analyses examining the relationship of DDS to undernutrition in urban and in rural samples.

3. RESULTS AND DISCUSSION

3.1 Results

3.1.1 Descriptive statistics of maternal, child and household characteristics

Tables 2 and 3 present descriptive statistics for the variables used in further analyses. Males and females are evenly distributed in both rural and urban samples. The average age was the same for rural and urban children. The patterns of anthropometric indicators observed here are typical of most developing countries, especially among rural children. The mean z-scores are significantly lower in the rural children as compared to urban children. This was expectedly reflected in the prevalence of stunting, underweight, and wasting in Table 3. Stunting is markedly higher in rural children compared to urban children (31.3% versus 24.7%, $p < 0.018$). Underweight is also significantly higher in rural children compared to urban children (17.8% versus 12.5%, $p = 0.018$), so is wasting (13.0% versus 8.4%, $p = 0.020$). Maternal parity was significantly higher in the mothers of rural children compared to the mothers of urban children ($p < 0.001$), and the number of children under five years living in households was significantly greater in rural compared to urban households ($p < 0.001$). The mean DDS was significantly higher in the urban settings compared to rural settings (6.61 ± 2.94 versus 5.57 ± 3.19, $p < 0.001$).

Breastfeeding was more prevalent among rural women compared to urban women (71.4% versus 58.5%, $p < 0.001$). Bottle-feeding was not common; however, the prevalence was twice as high in the urban children compared to the rural children (12.2% versus 6.3%, $p < 0.001$).

There were significant disparities in maternal education between rural and urban children. About 19 percent of urban women reported no education as compared to 46 percent of rural women. Conversely, 58.3 percent of urban women reported at least some secondary education as compared to about 30 percent of rural women. Maternal BMI, an indicator of maternal nutritional status, was significantly higher in the mothers of urban children compared to rural children ($p < 0.001$).

Table 2. Descriptive statistics of study sample (Total n = 1187): continuous variables (means and standard deviations)

Variable	Rural		Urban		
Total sample, n	**794**		**393**		
	Mean	**SD**	**Mean**	**SD**	***P***
Child					
Age (mo)	19.69	8.63	20.03	8.39	0.520
Birth order	3.53	2.24	2.67	1.74	0.001
Height-for-age Z-scores	-1.18	1.67	-.89	1.79	0.006
Weight-for-age Z-scores	-.91	1.27	-.61	1.33	0.001
Weight-for-height Z-scores	-.40	1.48	-.19	1.49	0.019
Mother					
Age	29.10	7.04	29.35	6.19	0.530
Weight	55.44	8.95	63.67	12.14	0.001
Height	1.59	0.07	1.60	0.08	0.170
BMI (kg/m^2)	22.00	3.31	25.10	4.92	0.001
Parity	3.67	2.26	2.78	1.74	0.001
Household					0.001
Number of children U5 years	1.98	1.07	1.67	.80	0.001
Dietary diversity					
Dietary diversity score	5.57	2.94	6.61	3.19	0.001

**Continuous variables used in the analysis*

Two percent of urban households and 48 percent of rural households were in the poorest wealth quintile. Contrariwise, about 33 percent of urban household were in the richest wealth quintile as compared to only two percent of rural households. These differences were statistically significant ($p < 0.001$).

3.1.2 Bivariate analysis

This analysis was done to establish the association between DDS and the main indicators of malnutrition: stunting, underweight, and wasting. A statistically significant association was found between DDS and wasting (Wald = 12.48: $p < 0.001$). There were insignificant associations between DDS and stunting (Wald = 0.07; $p = 0.79$) and underweight (Wald = 3.0; $P = 0.083$).

3.1.3 Multivariate analysis

Table 4 presents logistic regression models of the association between DDS and W/H, accounting for other potential determinants of wasting. DDS was associated with lower likelihood of wasting in rural children (Model A), after controlling for child, maternal, and household level variables. A one point increase in DDS was associated with an 11% reduced odds of being wasted among children aged 6-36 months (OR = 0.89, 95%, C.I.: 0.80 - 0.99). In addition to DDS, only maternal BMI, parity, continued breastfeeding, birth order and region of residence were statistically significant predictors of wasting. A higher likelihood of wasting was predicted by lower maternal BMI, lower parity, later birth order, and continued breast feeding. Two additional logistic regression analyses were done to test for interaction effects between DDS and the other predictor variables in the urban and the rural samples (interactions were not included in the analysis shown in Table 4). In the additional analysis, only one interaction was statistically significant; in the rural sample only, DDS and

W/H were more strongly associated in low BMI women than in high BMI women (Beta = -0.32, O.R. = 0.73, 95% C.I. = 0.57 – 0.94).

Table 3. Descriptive statistics of study sample (total n = 1187): categorical variables (percentages)

Variable	Rural	Urban	*P*
Total sample, n	**794**	**393**	
Child			
Sex	%	%	
Male	51.3	49.1	0.490
Female	48.7	50.9	
Size of child at birth			
Small or < average	15.9	12.1	0.200
Average or > average	62.1	66.1	
Very large	22.1	21.9	
Still breastfeeding			
Yes	71.4	58.5	0.001
Use of feeding bottle			
Yes	6.3	12.2	0.001
Height-for-age <-2SD	31.3	24.7	0.018
Weight-for-age < -2 SD	17.8	12.5	0.018
Weight-for-height < -2 SD	13.0	8.4	0.020
Mother			
Level of education			
No education	45.8	18.8	0.001
Primary	24.7	22.9	
Secondary+	29.5	58.3	
White collar	28.5	64.9	0.001
Agriculture/labour	71.5	35.1	
Anaemia level			
No anaemia	36.7	42.4	0.170
Mild	41.8	38.0	
Severe/moderate	21.5	19.6	
Household level			
Wealth index			
Poorest	47.9	2.0	0.001
Poorer	27.6	10.4	
Middle	14.2	18.3	
Richer	8.4	36.6	
Richest	1.9	32.6	
Region			
Accra	1.9	22.1	
South	36.1	28.5	
Middle	22.8	32.1	
Northern	16.5	9.4	
Upper	22.7	7.9	

**Categorical variables used in the analysis*

The results presented in Model B show that DDS was not a significant predictor of childhood wasting in urban children, after controlling for all potential predictors. The only variables that were significant predictors of wasting in urban children were maternal education, Body Mass Index (BMI) and household Wealth quintile.

Table 4. Predictors of childhood wasting for children 6-36 months of age in rural and urban settings

Variables	Model (A): Rural					Model (B): Urban				
	Std error	OR	C.I for ORS	Wald F	*P*	Std error	OR	C.I for ORS	Wald F	*P*
Dietary diversity										
Dietary diversity score	0.06	0.89	0.80, 0.99	4.94	0.027	-0.068	0.97	0.85, 1.11	0.35	0.680
Wealth quintile										
Poorest vs. Richest	1.34	0.26	0.02, 3.59	1.93	0.310	1.24	26.84	2.34, 308.57	2.06	0.009
Poor vs. Richest	1.33	0.51	0.04, 6.92		0.610	1.06	2.39	0.30, 19.25		0.410
Middle vs. Richest	1.36	0.77	0.05, 11.27		0.850	0.69	1.94	0.51, 7.52		0.330
Rich vs. Richest	1.32	1.09	0.08, 14.80		0.950	0.48	0.97	0.37, 2.49		0.940
Maternal education										
No education vs. Secondary+	0.42	1.16	0.50, 2.67	0.47	0.730	0.45	4.06	1.69, 9.80	8.40	0.002
Primary vs. Secondary+	0.39	0.80	0.39, 1.64		0.540	0.68	0.55	0.15, 2.01		0.360
Maternal occupation										
Agric/labour vs. White collar	0.32	0.57	0.31, 1.07	3.12	0.080	0.51	0.98	0.37, 2.74	0.001	0.960
Region										
Upper vs. Accra	0.58	0.51	0.16, 1.60	3.51	0.240	1.10	0.47	0.06, 4.10	2.30	0.500
Northern vs. Accra	0.55	0.47	0.16, 1.38		0.170	1.15	0.06	0.01, 0.58		0.015
Middle vs. Accra	0.54	0.22	0.07, 0.62		0.005	0.51	1.11	0.41, 2.99		0.840
South vs. Accra	0.53	0.27	0.10, 0.76		0.014	0.67	1.38	0.37, 5.15		0.630
Still breastfeeding										
Yes vs. No	0.34	3.25	1.66, 6.38	11.90	0.001	0.54	2.13	0.72, 6.21	1.94	0.170
Sex of child										
Female vs. Male	0.28	1.60	0.92, 2.74	2.83	0.090	0.49	1.20	0.46, 3.13	0.14	0.710
Continuous predictors										
Maternal height	2.06	0.07	0.001, 4.03	1.67	0.200	2.20	1.49	0.02, 112.88	0.03	0.860
Maternal BMI	0.06	0.86	0.77, 0.96	7.24	0.008	0.04	0.93	0.87, 0.99	4.74	0.031
Maternal age	0.03	0.63	0.94, 1.04	0.24	0.630	0.05	0.98	0.89, 1.07	0.30	0.590
Maternal parity	0.64	0.16	0.05, 0.58	7.94	0.005	0.72	0.60	0.15, 2.49	0.49	0.450
Child birth order	0.64	6.83	1.94, 24.01	9.06	0.003	0.74	1.79	0.42, 7.71	0.55	0.430
No. Of children U5	0.19	1.33	0.91, 1.95	2.13	0.150	0.24	1.14	0.71, 1.81	0.23	0.590

**Determinants of child nutritional status used in the logistic regression analysis; OR; Odds Ratio, C.I; Confidence Intervals, U5; Under five years*

3.2 Discussion

Our analysis shows that low dietary diversity is significantly associated with wasting among rural children, and not among urban children. The association between DDS and W/H remained after household wealth and other covariates were accounted for in multivariate analyses. The DDS-W/H relationship was stronger for children with lower BMI mothers compared to higher BMI mothers, in the rural sample only (i.e., the trend was more pronounced in the rural low BMI group than in the rural high BMI group). We assume that this reflects unmeasured variation in the quantity of food consumed, which is not captured by the DDS. Rural households with low dietary diversity may nevertheless have access to ample quantities of calories, reflected in higher BMI in mothers and less wasting in children. This possibility could not be investigated in this present study, due to a lack of sufficiently detailed data in the DHS on nutrient intake.

Comparing these findings with others reported in the literature, in Ethiopia Arimond and colleagues observed that dietary diversity was positively associated with child stunting in both urban and rural children [11]. However in this same study, child feeding index was significantly associated with childhood stunting only in the rural sample. A study in Mali found that the association between dietary diversity and child nutritional status was significant only in urban children for underweight and stunting, but not for wasting [22]. This divergent mix of significant and non-significant associations observed despite the employment of different methodologies by these studies, suggests that dietary diversity is associated importantly with child nutritional status, but that the underlying mechanisms are complex.

In that regard, we note that mean DDS is higher in urban than in rural children such that some of the potential for a protective effect is already achieved in urban children. There might be a threshold for protection from wasting, with DDS above a certain level being of diminished importance to health. Our enthusiasm for this explanation is tempered somewhat by the fact that on a DDS scale ranging from 0 to 16, the urban/rural difference score is a modest 1.04. Nevertheless, Arimond et al. [11] found that for every increase in DDS, there is a significant association with child nutritional outcome.

It is also important to note that our DDS scale places equal weight on all 16 food group items, and this may introduce a bias if food group composition varies systematically between urban and rural areas, or if food group consumption tends to happen in clusters of food groups, that might in turn differ by urban/rural residency. As Arimond and Ruel [2] observed, high dietary diversity may be more or less nutritionally meaningful, depending on local diet patterns. Thus, if many food groups are given but in very small quantities, the diversity scores will have less nutritional meaning [2]. In the context of our study, although urban children are slightly advantaged in terms of number of food items eaten over 24-hours, they might have received these food items in smaller quantities, while the rural children received the food groups available to them in larger quantities. An alternative approach to the study of the relationship between DDS and child growth could be to use a statistical method capable of identifying underlying patterns in food group consumption. Muthén and Christoffersson [34] suggest a method for the simultaneous factor analysis of dichotomous variables in two groups, which might work well for the 16 DDS items, and could be one way to tackle the problem of understanding food group consumption patterns in various socio-demographic groups (e.g., urban versus rural, richest versus poorest, etc.). However analyses in that direction were beyond the scope of this paper.

There are some limitations associated with our analysis. The DDS score was created using DHS data, which does not provide information on the quantity of food consumed or the adequacy of nutrient intake. This limitation notwithstanding, previous studies have shown that high dietary diversity is associated with adequate nutrient intake [2,4,9,10,11,12,13,35,36,37]. Another limitation has to do with the fact that the data are from a cross sectional study, and a causal relationship between dietary diversity and child nutritional status cannot be established. It is worth noting that the statistical power in the rural analysis was greater than in the urban analysis due to sample size differences. This affects the width of the confidence intervals around the O.R. estimates. Yet the O.R. for DDS in the urban sample is so close to one that we conclude there was no association. Of some concern, also, is the use of maternal self-reports of child size at birth, which is the only measure of child size available for almost all children, as many births in Ghana do not include weighing the new born. While the DHS reports that maternal self-report of child size is a good proxy measure, they do not cite data in support of this assumption [29]. However, one study has compared maternal self-report of child birth weight with measured weight, and observed no significant differences [38], and another found that self-report birth weights are unbiased but less precise than recorded birth weights [39].

A potential limitation of our regression analysis is that we could not use instrumental variables to address the problem of endogeneity, which could arise if DDS is determined by factors that also influence the outcome variable (wasting). Maternal education and household wealth index are likely factors that may directly influence the DDS as well as children nutritional status. Failure to control for endogeneity can lead to biased coefficient estimates [40]. One way to address the problem of endogeneity is the use of instrumental variables and two-stage regression methods. To use this method, it is important to identify at least one variable that is associated with the DDS but not with wasting. However, none of the variables available in DHS data meet this criterion [41].

4. CONCLUSION

Dietary diversity has a modest but statistically significant association with wasting among children in rural but not in urban Ghana. Interventions to combat acute malnutrition in rural settings should include efforts to promote the consumption of a variety of food groups.

CONSENT

Not applicable.

ETHICAL APPROVAL

Not applicable.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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III

Influence of Childcare practices on nutritional status of Ghanaian children: a regression analysis of the Ghana Demographic and Health Surveys

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ABSTRACT

Objectives: Guided by the UNICEF framework for childcare, this study examined the association of childcare practices (CCP) to infant and young children's growth (height-for–age Z scores, or HAZ), and (b) investigated whether care practices are more important to growth in some socio-demographic subgroups of children.

Design: Cross sectional survey

Setting: Urban and rural Ghana

Participants: The study sample comprised 1187 dyads of mothers' aged 15-49 and their youngest child (aged 6-36 months).

Results: The results showed that CCP was a significant predictor of HAZ, after controlling for covariates/confounders at child, maternal and household levels. Children with higher CCP scores had higher HAZ scores. A unit increase in CCP score was associated with a 0.17 unit increase in HAZ. Child's and mother's age, number of children under five, place of resident, maternal weight, and wealth index were also significantly associated with HAZ. Statistical interaction analyses revealed no subgroup differences in the CCP/HAZ relationship.

Conclusions: This study found a significant, positive association between CCP and child growth, after accounting for other important determinants of child growth at maternal and household levels. This calls for research into the effects on growth of various CCP components, with longitudinal cohort study designs that can disentangle causal relationships.

Keywords: Care practices, nutritional status, children, Ghana Demographic and Health Survey

Strengths and limitations of this study

- Use of high quality nationally representative sample to investigate the relationship between childcare practices and nutritional outcomes
- Creation of a composite childcare measure including home care and medical care dimensions
- Cross-sectional survey design, while a longitudinal cohort design would be preferred
- Lack of variables to measure cultural, socio-political and locality influences on child health

Introduction

The foundational UNICEF framework for child health emphasizes that childcare practices (CCP) are vitally important in promoting child nutrition and health(1). Socio-demographic factors (e.g., parental education and income) are also emphasized in the UNICEF framework, and are consistently found to have a graded relationship with health(2). However, little is known about the degree to which CCP are consistently related to child health in the face of the widely differing socio-demographic backgrounds that characterize societies.

Childcare is a complex concept including a range of behaviors and practices of care givers that provide the food, health care, stimulation, and emotional support necessary for children's healthy survival, growth, and development (3). As part of CCP, feeding and health care underlie dietary sufficiency and protection from disease, which in turn impacts child health, for which physical growth is a critical marker (4).

A robust finding in public health research is that of a graded relationship between socio-demographic status (SDS) and health(5). Low SDS translates predictably into lessened food security and reduced access to health care. However, even in households with food insecurity due to poverty and poor access to health care, families can optimize the use of the existing resources to promote health (3, 6). This calls for further research to illuminate the relationship between childcare and child health, in economically vulnerable as well as secure households and communities. An ecological approach to such research calls for specification not only of proximal influences on child health

such as feeding practices, but also consideration of more distal factors such as caregivers' health literacy, availability of resources such as clean water and sanitary living conditions and accessible health care (7) .

In the Global South[1], interventions to reduce child under-nutrition focus often on household food security (adequacy of food availability), without taking into consideration the complementary role of quality childcare. This can be seen in most of the nutrition intervention programs in Ghana(8). Yet, food security alone is not enough to improve children's nutritional status, and the significance of care practices to improving child nutritional status has been documented repeatedly (6, 9-16)**.** Despite the fact that quality of childcare has a demonstrated role in alleviating child under-nutrition in resource-constrained settings like Ghana, there have been only two Ghanaian studies (of which we are aware) that have examined the role of childcare in relation to child nutritional status. The pioneering study of Ruel and her colleagues(6) in urban Accra used a composite care practices variable (care practice index) to examine the importance of care for healthy child nutrition. The other study, by Nti and Lartey (16), was conducted in one rural area; both studies found a significant association between care practices and child nutritional status. However, the setting-specificity of these two studies limits the generalizability of their findings. Addressing this limitation, this paper presents an analysis of the relationship between care practices and child nutritional status in Ghana, using a

[1] By 'Global South' we refer to parts of the world that are also termed 'the third world' and 'developing countries' (which may carry pejorative connotations). The Global South is a geopolitical concept including parts of the world located notably in the Equatorial Zone that have colonial pasts, challenging geopolitical conditions, and that are rising in economic, social and political resilience. Regions having these conditions are of course found outside the Equatorial Zone.

national representative sample. The primary objective of this analysis was to examine the influence of CCP on children's HAZ, controlling for covariates and potentially confounding factors at child, maternal, household, and community levels. The secondary objective was to establish whether care practices were more important to growth in some socio-demographic subgroups of children compared to others.

METHODS

Data sources

Ghana Demographic and Health Survey (DHS) data collected in 2008 were used for the analysis. These data are in the public domain and available from MEASURE DHS website (17). The Ghana Statistical Service and the Ghana Health Service collected the data, using the 2000 national population census as a sampling frame. Ethical clearance was obtained from the Ghana Health Service Ethical Review Committee.

The participants were 1,187 children aged 6-36 months (393 urban and 794 rural) from whom anthropometry data were obtained. This excluded 224 children in the survey from whom complete and in-range anthropometry data could not be obtained. The weight measurements were undertaken using electronic Seca scales. Height measurements were obtained using a measuring board. Children younger than 24 months were measured lying on the board, while standing height was measured for older children (18).

Outcome variable

The outcome variable for this analysis was Height-for-age Z-scores (HAZ).

Childcare practices (CCP) measurement

The variables used in creating the CCP score were feeding practices variables and use of preventive health service. The feeding practices variables included dietary diversity score, which was created using 16 food groups: 1) tinned/powder or fresh milk; 2) baby formula; 3) baby cereal; 4) bread, rice, noodles, other made from grains; 5) potatoes, cassava, or other tubers; 6) eggs; 7) meat (beef, pork, lamb, goat, chicken etc.); 8) dark green leafy vegetables; 9) mangoes, papayas, other vitamin A fruits; 10) other fruits; 11) pumpkin, carrots, squash (yellow or orange inside); 12) liver, kidney, heart, other organs; 13) fish or shellfish(fresh or dried); 14) food made from beans, peas, lentils, nuts; 15) oils, fats, butter, products made from them; 16) cheese, yogurt, other milk products. Details about the DDS are presented elsewhere (19). Other feeding variables were frequency of feeding solid or semi-solid food and breastfeeding status. The preventive health service variables included; BCG vaccination, DPT, Hepatitis B, influenza, polio and measles vaccinations, iron supplementation, and use of drugs for intestinal parasites.

The CCP score was created using the results of Principal Component Analysis (20-22). We employed the regression method, with component loadings adjusted to account for the correlations between variables, and used the oblique factor rotation procedure. Component extraction was based on eigenvalues >1, and four principal components were extracted that explained 70% of the

variance. No item had a loading less than .4 (20). Therefore, all the items were used to create the composite care practices score, treated in subsequent analyses as a continuous variable.

Other variables used in the analysis:

(a) maternal age, height, weight, number of antenatal visits (ANC) education, occupation, anemia level, and parity;

(b), method of disposal of youngest child stools;

(b) empowerment variables including women's role in household decision making, opinion regarding wife beating, and attitudes regarding sexual relations with husband;

(c) household level variables including number of children under 5 years in household, Wealth Index, urban/rural place of residence, source of drinking water, religion and type of toilet facilities; and

(e) the child level variables sex and age (child's age was transformed into age squared and included in regression analyses to account for non-linearity of the age variable (23)**.**

Some of the variables were recoded. Source of drinking water and toilet facilities were recoded according to WHO and UNICEF (24) recommended classifications: 'improved' and 'unimproved' water and 'improved' and 'unimproved' sanitation

facilities. The disposal of the youngest child stool was recoded into 'appropriate' and 'inappropriate' disposal methods. Maternal occupation was recoded into 'white collar' and 'agriculture/labor', and religion into 'Christians' and 'other religions'. For the empowerment variables, three indices were created based on the DHS (18) recommended procedure (number of household decision making, opinion regarding wife beating, and justified to refuse sexual intercourse with husband). High scores were coded 'more empowered' and low scores 'less empowered'. The wife beating attitude variable was reversed coded so that a high score corresponded to be more empowered.

Analytical framework and methods

This analysis is framed using the UNICEF conceptual framework in which food, health, and care are posited as the three key pillars influencing child survival, growth and development (1). The model identifies three levels of causes of child under-nutrition: immediate (operating at the individual level), underlying (influencing household and communities) and basic causes (structure and processes of societies). The model suggests that these causal factors affect child nutritional status in a chain-like manner—the basic factors affect the underlying factors, which in turn affect the immediate factors, in turn affecting child nutrition status. The model was extended by Engle and colleagues (25) and the above levels reclassified broadly as context, resources and care giving. This analysis used this framework to structure the hierarchical multiple regression analyses.

The General Linear Model (GLM) in the SPSS 21 Complex Samples command was used to perform the multivariate analysis. The GLM was used to allow adjustment for survey design effects (sample weight, strata, and cluster). The analysis involved four steps. The first step (model A) contained only the basic characteristics of the mother (age) and child (age and sex), to examine the direct effects of these factors on HAZ. The second step (model B) introduced context variables (place of residence and religion) in the model in the presence of the basic factors to establish how the context variables were directly related to HAZ. The third step (model C) introduces resource variables (education, occupation, anemia level, parity, disposal of youngest child stool, household decision making, opinion regarding wife beating, justified to refuse sexual intercourse with husband, number of children under 5, wealth index, source of drinking water, type of toilet facilities), controlling for basic and contextual factors. In the final step (model D), CCP score was introduced, controlling for basic, contextual and resource factors. Tests of interactions between the CCP score and other predictor variable were undertaken, because previous research has documented that children from poorer households and/or those of mothers with less education may be more likely to benefit more from better care practices, compared to children of wealthier households or those of mothers with better education(6).

RESULTS

Characteristics of the sample

Tables 1 and 2 present the descriptive statistics of the sample. The average age of children used in the analysis was about 20 months. The mean Height-for-Age Z-score for the sample was -1.09 (S.D. = 1.7), while that of weight-for-age and

weight-for-height Z-scores respectively were -0.81 (S.D. = 1.3) and -0.33 (S.D. = 1.5). The average prevalence of stunting, underweight and wasting were 29.1%, 16.0%, and 11.5% respectively. The average age of the mothers was 28 years. The number of Antenatal visits was relatively low (1.74 visits). Breastfeeding was generally above average in this population (67%). The average frequency of feeding the child with solid or semi-solid food within 24hours was 2.59. Immunization rates were high among this population. BCG, which is given at birth, was as high as 94%. Additionally, 87.7% of children older than three months had received all their DPT vaccination and 85.6% received polio 3 vaccinations. For children older than 9 months, 86.7% received measles vaccination. Fewer children in the sample received iron supplement (29.0%). The use of drugs for intestinal parasites was low (37.2%), probably because the children in the sample were relatively young. With regards to water and sanitation, 22.2% of this population did not have access to improved source of water and 47% used unimproved sanitation facilities. Also, a high proportion of mothers (63%) used inappropriate ways to dispose the youngest child stool.

Table 1: Characteristics of the sample (N = 1,187), continuous variables

Variables	Mean	SD
Child age	19,8	8,55
Child Height-for-age Z-scores (HAZ)	-1,09	1,72
Child weight-for-age Z-scores (WAZ)	-0,81	1,3
Child weight-for-height Z-scores (WHZ)	-0,33	1,49
Maternal age (in years)	28,18	6,77
Maternal height (in cm)	1,59	0,07
Maternal weight (in cm)	58,17	10,83
No. of children U5 in household	1,88	1.00
No. of ANC visits	1,74	0,53
Number of times child ate solid, semisolid or soft food yesterday	2,59	1,32
Dietary diversity score for child	5,92	3,06

Table 2: Characteristics of the sample (N = 1,187) categorical variables

Characteristics	N	(%)
Sex of child		
Male	600	50,5
Female	587	49,5
Still breastfeeding (yes)	797	67,1
Use of preventive health service		
Received BCG (yes)	1120	94,5
Received DPT/Hep B/Influenza 3 (yes)	1037	87,7
Received POLIO 3 (yes)	1013	85,6
Received Measles > = 9 months (yes)	927	86,7

Taking iron pills, sprinkles or syrup (last 7 days) (yes)	343	29,0
Drugs for intestinal parasites (yes)	438	37,2
Anemia level (some anemia)	718	61,5
Empowerment		
Participation in decision-making		
Low participation		
	343	28,9
Husband justified in beating wife		
Less sense of empowerment	267	23,1
Wife justified in refusing sex		
Less Empowered	173	15,1
Water and sanitation		
Source of drinking water		
Unimproved	262	22,2
Type of toilet facilities		
Unimproved	557	47,3
Disposal of youngest child stool		
inappropriate disposal practice	740	62,6
Religion		
Christian	802	67,7
Other religions	383	32,3
Place of residence		
Urban	394	33,1
Rural	793	66,9

Bivariate analysis of the association between CCP and HAZ

Bivariate analysis was carried out to examine the associations between CCP and child nutritional status. The results show a strong positive association between care practices and child HAZ (Beta = .12, t = 3.73, *P* <. 001).

Multivariate analysis of the determinants of child nutritional status

The results of the HAZ regression analyses are presented in Table 3. The analysis was guided by the framework described earlier and the presentation of results in Table 3 follows the framework. In models A and B, both basic and contextual factors were significant predictors of HAZ -- maternal age, number of children under-five, and place of resident were positively associated with HAZ, while child age was negatively associated with HAZ. Model (C) tested main effects of resources after controlling for basic and contextual factors. Only maternal weight and Wealth Index were significantly associated with HAZ. Model (D) tested for a main effect of CCP, which was a significant predictor of HAZ after adjustment for maternal and child basic factors, context, and resources. A one-unit increase in CCP score was associated with a 0.17 unit increase in HAZ. To establish if some subgroups in the sample benefit more from CCP than others, an interaction analysis was carried out between the CCP variable and child sex, Wealth Index, maternal education, maternal occupation and place of residence. No significant interactions were observed (results not shown)

Table 3: Multivariate analysis of determinants of nutritional status of children in Ghana, aged 6-36 months

	Model (A)		Model (B)		Model (C)		Model (D)	
	Coefficients	T-statistics	Coefficients	T-statistics	Coefficients	T-statistics	Coefficients	T-statistics
Variables								
Maternal and child basic factors								
Child sex								
Male(ref)								
Female	-0.12(.10)ŧ	-1.18	-0.12 (.10)	-1.13	-0.08 (.10)	-0.77	-0.15 (.11)	-1.38
Child age	-0.24 (.04)	-6.70*	-0.24 (.04)	-6.48*	-0.21 (.04)	-5.66*	-0.25 (.04)	-6.49*
Child age square	0.005 (.001)	5.67*	0.005 (.001)	5.47*	0.004 (.001)	4.66*	0.005 (.001)	5.02*
Maternal age	0.02 (.01)	2.88*	0.02 (.01)	2.93*	0.01(.01)	0.95	0.02 (.01)	1.52
No. of children U5	-0.13(.06)	2.37*	-0.10(.06)	1.79	-0.11 (.06)	-1.89	-0.17 (.08)	-2.13*
Contextual factors								
Place of residence								
Urban (ref)								
Rural			0.30 (.12)	2.34*	-0.09 (.16)	-0.54	-0.08 (.16)	-0.49

Religion						
Christian (ref)						
Other religions	0.21 (.11)	1.85	0.17 (.12)	1.36	0.10 (.13)	0.81
Resources						
Maternal resources						
Height			1.84 (.95)	1.94	1.39(.99)	1.40
Weight			0.02 (.01)	2.34*	0.01 (.01)	1.75
Anemia level						
No anemia (ref)						
Some anemia			-0.02 (-.11)	-0.22	-0.09 (.12)	-0.73
Parity			0.01 (.04)	0.30	0.01 (.05)	0.21
Education and occupation						
Secondary+ (ref)						
Education (if primary)(0,1)			0.14 (.14)	1.04	0.01 (.15)	0.07
Education (if no education)(0,1)			-0.04 (.16)	-0.25	-0.08 (.17)	-0.45
White color (ref)						
Agricultural/Labour			-0.06 (.12)	-0.49	-0.11 (.14)	-0.83
Empowerment						

Participation in decision-making				
High participation (ref)				
Low participation	0.14 (.11)	1.27	0.06 (.12)	0.54
Husband justified in beating wife				
Greater sense of empowerment (ref)				
Less sense of empowerment	-0.002 (.12)	-0.02	0.08 (.12)	0.66
Wife justified in refusing sex				
More empowered (ref)				
Less Empowered	0.11 (.16)	0.72	0.10 (.16)	0.62
Household resources				
Wealth index				
Wealth index (if richest)(0,0)(ref)				
Wealth index (if richer)(0,1)	0.43 (.22)	1.93	0.35 (.23)	1.51
Wealth index (if middle)(0,1)	0.59 (.24)	2.45*	0.53 (.25)	2.08*
Wealth index (if poor)(0,1)	0.79 (.28)	2.86*	0,68 (.26)	2.57*
Wealth index (if poorest)(0,1)	0.67 (.29)	2.91*	0.60 (.29)	2.08*
Water and sanitation				

Source of drinking water					
Improved (ref)					
Unimproved			0.06 (.13)	0.46	0.13 (.13)	0.98
Type of toilet facilities					
Improved (ref)					
Unimproved			-0.03 (.12)	-0.22	0.01 (.11)	0.12
Disposal of youngest child stool					
Good disposal practice (ref)					
Bad disposal practice			-0.06 (.12)	-0.54	0.09 (.12)	0.71
Child care practices					
Care practices score					0.17 (.08)	2.25*
R-square	**0.09**	**0.10**	**.14**		**.17**	
F	**19.58**	**14.86**	**6.46**		**6.56**	
N	**1,187**	**1,187**	**1,187**		**1,187**	

ǂ *Standard errors (in parentheses) * Statistical significant at p < .05*

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[2] The coefficients are standardized

DISCUSSION

We examined the influence of CCP on children's HAZ, controlling for covariates and potentially confounding factors at child, maternal, household, and community levels as suggested by the UNICEF framework for childcare. We also investigated if care practices were more important to growth in some socio-demographic subgroups of children compared to others. Regarding the first aim, we observed a statistically significant relationship between CCP and HAZ, which remained after adjusting for potential confounding factors at child, maternal, and household levels. Regarding the second aim, statistical interaction analyses revealed no subgroup differences in the CCP/HAZ relationship.

The finding on the CCP/HAZ relationship is in line with the few previous studies in the literature. Ruel and colleagues found that in urban Ghana, good childcare practices have the potential to mitigate the negative effect of low maternal education and poverty on children nutritional outcomes (6). A study by Nti and Lartey (16) in rural Ghana also observed a positive influence of care practices on child nutritional status. Conversely, both positive *and* negative effects on nutrition were observed in a study that used a positive deviant methodology to examine the relationship between care practices and child nutritional status in Bangladeshi children (9). With so few studies available on the CCP/child nutrition relationship, little can be concluded except that in Ghana at least, all three studies examining this issue have come to the same conclusion despite significant methodological variation; CCP is related to child nutritional status, seemingly regardless of a child's socio-demographic profile.

The above results illuminate the utility of the UNICEF conceptual framework used in this study, in organising and understanding multi-level factors that impact childcare and growth. This model posits that child growth is not only determine by the availability of adequate nutritious food, but that good care practices and access to health and other social services are equally important (1, 26) . This suggests that for optimal child health, these key elements are all highly relevant. As demonstrated by the index used in this study, strategies to improve child health outcomes should not be limited only to the provision of nutritious food but must also include the promotion of good care practices and access to health care. A particular value of using the UNICEF framework in this study was to expand our analytical consideration beyond the most proximal factors connected to child growth.

There is ample literature examining the relationship between some of the components of care practices -- such as feeding practices and dietary diversity -- and child nutritional outcomes. Studies in Latin America and Ethiopia using the DHS data observed that good child feeding practices were associated with an improvement in children nutritional outcomes (14, 27). Dietary diversity studies have also observed positive associations (11, 28-31). The present investigation did not decompose CCP to enable analyses of feeding versus non-feeding aspects of childcare, and that is a priority for further analyses. Yet, all CCP aspects have face value for one or another facet of child well-being, even if certain aspects of CCP may carry greater weight for child health measured in specific ways.

Statistical interaction analyses did not produce evidence of significant interactions in this sample, suggesting that no subgroup in this population benefited less from good CCP than other subgroups. This is contrary to a study in urban Ghana which revealed that children from poorer households and/or those of mothers with less education were more likely to benefit from better care practices compared to children of wealthier households or those of mothers with better education(6). The differences in results could be due to the differences in composition of samples used by both studies. While the present study uses data made up of both urban and rural settings, Ruel and colleagues used data from only urban settings. In addition, alternative ways of coding certain predictors (for example a dichotomized household wealth index) might have revealed interaction effects that are not evident with the present methodology.

The major strength of this study is the use of high quality nationally representative data to investigate the relationship between childcare practices and nutritional outcomes. This makes it possible for these findings to be generalized to the whole of Ghana. The additional strength of our study is that we have measured and quantified care practices into a composite score using a nationally representative cross sectional data. This enables us to examine the impact of care practices collectively on child nutritional status.

A limitation of this analysis is the inability to disentangle potential reciprocal causation. Our conclusions are therefore carefully restricted to statements about the association between CCP and HAZ, after other variables such as Wealth Index

(WI) are accounted for. WI, CCP and HAZ are interrelated; each may have causal impact on the other. We have not undertaken to use instrumental variables to gain greater clarity of this matter, but this may be advisable now that the significant association between CCP and HAZ is confirmed. A challenge to move in this direction is the identification of appropriate instrumental variables (ones that are associated with CCP but not with HAZ, except for their indirect association via CCP). For example, WI might be used as an instrumental variable under the assumption that its only association with HAZ is via CCP. However, it is equally plausible that WI and HAZ are directly associated, with a family having a low HAZ child using more resources (depleting WI) in order to provide more CCP. It is generally a big challenge to settle on suitable variables in the DHS data for the creation of instruments. The difficulties in using the DHS data to create instrumental variables to address the problem of endogeneity have been documented by previous studies in this area (14)

Another limitation has to do with the variables used in creating the CCP score. We did have reasonably satisfactory variables available in our data set for home-based care practices and food availability, but the availability of health services and healthy environment variables was less satisfactory. We did not also have a good variable for the measurement of household hygiene. In addition, this study lacked the ability to take into account a host of cultural, socio-political and locality factors (local contexts), unmeasured by DHS that undoubtedly influence child health. We cannot reject the possibility that some of such factors account for the observed relationship between CCP and HAZ, in part or in whole.

A limitation that requires comment is the dichotomous treatment of religion, which collapsed all Christian denominations and compared them with all other groups. There are of course very important religious affiliation distinctions that might impact health, also within major religious groups like Christians. In this sample, all these groups were represented: Catholic, Anglican, Methodist, Presbyterian, Pentecostal/Charismatic, Moslem, Traditional/spiritualist, and not religiously affiliated. The decision to cluster religiosity into two groups obfuscated these distinctions, yet preserved some information about religious affiliation. The rationale was that only a qualitative research approach might do justice to the manifold shades of meaning that religiosity might have in connection with child care in Ghana. We considered avoiding oversimplification by not including data on religion in the analysis, but opted for the sub-optimal solution distinguishing Christians from others. We are not aware of any more nuanced approach to the study of religiosity and health in survey research, except perhaps in study designs in which religiosity and health are the main focus; such was not the case in the present investigation.

CONCLUSIONS

This study found a significant, positive association between CCP and child HAZ, after accounting for other important determinants of child growth at maternal and household levels. Optimizing the overall care quality through the inclusion of all components of care practices may be essential to improve child nutritional status, rather than focusing on the individual components of care. This calls for research into the effects on growth of various CCP components, with longitudinal cohort study designs that can disentangle causal relationships.

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COMPETING INTEREST

The authors have no competing interests to declare.

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AUTHORS' CONTRIBUTION

DAA designed the study, performed the data analysis, interpreted the results and drafted the manuscript. MBM contributed to the study design, data analysis and interpretation and revised the manuscript. AL, HBU and DJM contributed to data analysis, interpretation and critical revision of the manuscript. All authors read and approved the final version. All authors take responsibility of any issues that might arise from the publication of this manuscript.

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APPENDIX: Survey Questionnaire

IV

Questionnaire serial no._____ SEPTEMBER 2008

GHANA DEMOGRAPHIC AND HEALTH SURVEY

HOUSEHOLD QUESTIONNAIRE

MINISTRY OF HEALTH, GHANA GHANA STATISTICAL SERVICE

IDENTIFICATION

LOCALITY NAME _____

NAME OF HOUSEHOLD HEAD _____

EA NUMBER . . . . . | | |

STRUCTURE NUMBER . . . . . | | |

HOUSEHOLD NUMBER . . . . . | | |

REGION . . . . . | |

DISTRICT . . . . . | |

URBAN/RURAL (URBAN = 1; RURAL = 2) . . . . . |

CITY/LARGE TOWN/SMALL TOWN/VILLAGE (CITY=1, LARGE TOWN=2, SMALL TOWN=3, VILLAGE=4) |

HOUSEHOLD SELECTED FOR INDIVIDUAL INTERV EW(S) (YES = 1, NO = 2) . . . . . |

PERSON TO BE INTERVIEWED WITH THE DV MODULE IN THIS HOUSEHOLD . . . . . |
(WOMAN = 1, MAN = 2, NO ONE = 3)

INTERVIEWER VISITS

	1	2	3	F NAL VISIT
DATE				DAY
				MONTH
				YEAR 2008
INTERVIEWER'S NAME				INT. NUMBER
RESULT*				RESULT
NEXT VISIT: DATE				TOTAL NUMBER OF VISITS
TIME				

*RESULT CODES:

1 COMPLETED
2 NO HOUSEHOLD MEMBER AT HOME OR NO COMPETENT RESPONDENT AT 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)

TOTAL PERSONS IN HOUSEHOLD

TOTAL ELIGIBLE WOMEN

TOTAL ELIGIBLE MEN

TOTAL ELIGIBLE DEATHS FOR VERBAL AUTOPSY

LANGUAGE OF QUESTIONNAIRE: 1 LANGUAGE OF INTERVIEW:

LANGUAGE OF RESPONDENT TRANSLATOR USED: (YES = 1, NO = 2)

LINE NO. OF RESPONDENT TO HOUSEHOLD QUESTIONNA RE

LANGUAGE CODES: ENGLISH = 1, AKAN = 2, GA = 3, EWE = 4, NZEMA = 5, DAGBANI = 6, OTHER = 7 (SPECIFY) _____

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

Introduction and Consent

Hello. My name is _____ and
I am working for Ghana Statistical Service and Ministry of Health.
We are conducting a national survey about various health issues.
We would very much appreciate your participation in this survey. The survey usually takes between 10 and 20 minutes to complete.

As part of the survey we would first like to ask some questions about your household.
All of the answers you give will be confidential and will not be seen by anyone other than members of our survey team.
Participation in the survey is completely voluntary.
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 you will participate in the 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

							IF AGE 15 OR OLDER			
LINE NO.	USUAL RES DENTS AND VISITORS	RELATIONSHIP TO HEAD OF HOUSEHOLD	SEX	RESIDENCE		AGE	MARITAL STATUS	ELIG BILITY		
	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 5-32 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	CIRCLE LINE NUMBER OF ALL MEN AGE 15-59	CIRCLE LINE NUMBER OF ALL CHILDREN AGE 0-5
(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

	IF AGE 0-17 YEARS				IF AGE 3 YEARS OR OLDER		IF AGE 3-24 YEARS				IF AGE 0-4 YEARS
LINE NO.	SURVIVORSH P AND RESIDENCE OF BIOLOGICAL PARENTS				EVER ATTENDED SCHOOL		CURRENT/RECENT SCHOOL ATTENDANCE				B RTH REGIS-TRATION
	Is (NAME)'s biological mother alive?	Does (NAME)'s biological mother usually live in this household or was she a guest last night? IF YES: What is her name? RECORD MOTHER'S LINE NUMBER. IF NO, RECORD '00'.	Is (NAME)'s biological father alive?	Does (NAME)'s biological father usually live in this household or was he a guest last night? IF YES: What is his name? RECORD FATHER'S LINE NUMBER. IF NO, RECORD '00'.	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 current school year, that is, 2008 - 2009?	During this school year, what level and grade is (NAME) attending? SEE CODES BELOW.	Did (NAME) attend school at any time during the previous school year, that is, 2007 - 2008?	During that school year, what level and grade did (NAME) attend? SEE CODES BELOW.	Does (NAME) have a birth certificate? IF NO, PROBE: Has (NAME)'s birth ever been registered with the civil authority? 1 = HAS CERTIFICATE 2 = REGISTERED 3 = NEITHER 8 = DON'T KNOW
	(13)	(14)	(16)	(17)	(23)	(24)	(25)	(26)	(27)	(28)	(32)
	Y N DK		Y N DK		Y N	LEVEL GRADE	Y N	LEVEL GRADE	Y N	LEVEL GRADE	
01	1 2 8 → GO TO 16		1 2 8 → GO TO 23		1 2 → GO TO 32		1 2 → GO TO 27		1 2 → GO TO 32		
02	1 2 8 → GO TO 16		1 2 8 → GO TO 23		1 2 → GO TO 32		1 2 → GO TO 27		1 2 → GO TO 32		
03	1 2 8 → GO TO 16		1 2 8 → GO TO 23		1 2 → GO TO 32		1 2 → GO TO 27		1 2 → GO TO 32		
04	1 2 8 → GO TO 16		1 2 8 → GO TO 23		1 2 → GO TO 32		1 2 → GO TO 27		1 2 → GO TO 32		
05	1 2 8 → GO TO 16		1 2 8 → GO TO 23		1 2 → GO TO 32		1 2 → GO TO 27		1 2 → GO TO 32		
06	1 2 8 → GO TO 16		1 2 8 → GO TO 23		1 2 → GO TO 32		1 2 → GO TO 27		1 2 → GO TO 32		
07	1 2 8 → GO TO 16		1 2 8 → GO TO 23		1 2 → GO TO 32		1 2 → GO TO 27		1 2 → GO TO 32		
08	1 2 8 → GO TO 16		1 2 8 → GO TO 23		1 2 → GO TO 32		1 2 → GO TO 27		1 2 → GO TO 32		
09	1 2 8 → GO TO 16		1 2 8 → GO TO 23		1 2 → GO TO 32		1 2 → GO TO 27		1 2 → GO TO 32		
10	1 2 8 → GO TO 16		1 2 8 → GO TO 23		1 2 → GO TO 32		1 2 → GO TO 27		1 2 → GO TO 32		

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

LEVEL
0 = PRE-SCHOOL
1 = PRIMARY
2 = MIDDLE/JSS/JHS
3 = SECONDARY/SSS/SHS/TECH/VOC
4 = HIGHER
8 = DON'T KNOW

GRADE
00 = LESS THAN 1 YEAR COMPLETED (USE '00' FOR Q. 24 ONLY. THIS CODE IS NOT ALLOWED FOR QS. 26 AND 28)
98 = DON'T KNOW

							IF AGE 15 OR OLDER			
LINE NO.	USUAL RES DENTS AND VISITORS	RELATIONSHIP TO HEAD OF HOUSEHOLD	SEX	RESIDENCE		AGE	MARITAL STATUS	ELIG BILITY		
	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 5-32 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	CIRCLE LINE NUMBER OF ALL MEN AGE 15-59	CIRCLE LINE NUMBER OF ALL CHILDREN AGE 0-5
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
11			M F 1 2	Y N 1 2	Y N 1 2	IN YEARS		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 ☐

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 ☐

CODES FOR Q. 3: RELATIONSHIP TO HEAD OF HOUSEHOLD

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	(13)	(14)	(16)	(17)	(23)	(24)	(25)	(26)	(27)	(28)	(32)
11	Y N DK 1 2 8 GO TO 16		Y N DK 1 2 8 GO TO 23		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	
12	1 2 8 GO TO 16		1 2 8 GO TO 23		1 2 GO TO 32		1 2 GO TO 27		1 2 GO TO 32		
13	1 2 8 GO TO 16		1 2 8 GO TO 23		1 2 GO TO 32		1 2 GO TO 27		1 2 GO TO 32		
14	1 2 8 GO TO 16		1 2 8 GO TO 23		1 2 GO TO 32		1 2 GO TO 27		1 2 GO TO 32		
15	1 2 8 GO TO 16		1 2 8 GO TO 23		1 2 GO TO 32		1 2 GO TO 27		1 2 GO TO 32		
16	1 2 8 GO TO 16		1 2 8 GO TO 23		1 2 GO TO 32		1 2 GO TO 27		1 2 GO TO 32		
17	1 2 8 GO TO 16		1 2 8 GO TO 23		1 2 GO TO 32		1 2 GO TO 27		1 2 GO TO 32		
18	1 2 8 GO TO 16		1 2 8 GO TO 19		1 2 GO TO 32		1 2 GO TO 27		1 2 GO TO 32		
19	1 2 8 GO TO 16		1 2 8 GO TO 23		1 2 GO TO 32		1 2 GO TO 27		1 2 GO TO 32		
20	1 2 8 GO TO 16		1 2 8 GO TO 23		1 2 GO TO 32		1 2 GO TO 27		1 2 GO TO 32		

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

LEVEL

0 = PRE-SCHOOL
1 = PRIMARY
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4 = HIGHER
8 = DON'T KNOW

GRADE

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THIS CODE IS NOT ALLOWED FOR QS. 26 AND 28)
98 = DON'T KNOW

INFORMATION ABOUT DEATHS IN THE HOUSEHOLD IN THE PREVIOUS 5 YEARS

32A Now I would like to ask you about any deaths that occurred in his household in **the last 5 years**.
Since January 2003 has any usual member of this household died?

YES 1
NO . . . . . 2 ⟶ 101

32B How many deaths occurred to usual residents in this household in the last 5 years? ☐

NO.	What were the names of the people who died in the last 5 years?	Was (NAME) male or female?	In what mon h and year did (NAME) die? **IF MONTH DON'T KNOW RECORD '98'**	How old was (NAME) when he/she died? RECORD IN DAYS IF LESS THAN 1 MONTH; RECORD IN MONTHS IF LESS THAN 6 YEARS; OTHERWISE, RECORD IN YEARS.
32C	32D	32E	32F	32G
01	_____	MALE 1 FEMALE 2	MONTH ☐☐ YR 2 0 0 ☐	DAYS . 1 ☐☐ MONTHS . 2 ☐☐ YEARS . 3 ☐☐
02	_____	MALE 1 FEMALE 2	MONTH ☐☐ YR 2 0 0 ☐	DAYS . 1 ☐☐ MONTHS . 2 ☐☐ YEARS . 3 ☐☐
03	_____	MALE 1 FEMALE 2	MONTH ☐☐ YR 2 0 0 ☐	DAYS . 1 ☐☐ MONTHS . 2 ☐☐ YEARS . 3 ☐☐
04	_____	MALE 1 FEMALE 2	MONTH ☐☐ YR 2 0 0 ☐	DAYS . 1 ☐☐ MONTHS . 2 ☐☐ YEARS . 3 ☐☐
05	_____	MALE 1 FEMALE 2	MONTH ☐☐ YR 2 0 0 ☐	DAYS . 1 ☐☐ MONTHS . 2 ☐☐ YEARS . 3 ☐☐

We would like to get more information on the circumstances surrounding the deaths of children under the age of 5 years so that the government can provide health services to help reduce these deaths. If you don't mind, another member of our team will be coming later to interview members of the household about the death(s) you have just told me about.

CHECK HERE IF RESPONDENT DOES **NOT** AGREE TO THE VERBAL AUTOPSY VISIT
GO TO Q.101 IF THE RESPONDENT DOES NOT AGREE TO THE VISIT.
OTHERWISE PROCEED WITH Q.33. ☐

33 CHECK COLS. 32F AND 32G : RECORD NUMBER OF DEATHS TO CHILDREN UNDER 6 YEARS (AGE 0 to 71 MONTHS) SINCE JANUARY 2005. ☐

RECORD THIS NUMBER ON THE COVER PAGE AND ON THE INTERVIEWER'S ASSIGNMENT SHEET FOR TOTAL DEATHS ELIGIBLE FOR VERBAL AUTOPSY

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/INDOOR . . . . . 11 PIPED TO YARD/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 SACHET WATER . . . . . 92 OTHER _____ 96 (SPECIFY)	→ 106 → 103 → 106 → 103 → 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/INDOOR . . . . . 11 PIPED TO YARD/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 SACHET WATER . . . . . 92 OTHER _____ 96 (SPECIFY)	→ 106 → 106
103	Where is that water source located?	IN OWN DWELLING . . . . . 1 IN OWN YARD/PLOT . . . . . 2 ELSEWHERE 3	→ 106
104	How long does it take to go there, get water, and come back?	MINUTES . . . . . [ ][ ][ ] DON'T KNOW 998	
105	Who usually goes to this source to fetch the water for your household?	ADULT WOMAN . . . . . 01 ADULT MAN . . . . . 02 FEMALE CHILD UNDER 15 YEARS OLD . . . . . 03 MALE CHILD UNDER 15 YEARS OLD . . . . . 04 FEMALE AGE 15-17 YEARS OLD . . . . . 05 MALE AGE 15-17 YEARS OLD . . . . . 06 OTHER _____ 96 (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 he water safer to drink? Anything else? RECORD ALL MENTIONED.	BOIL . . . . . A ADD BLEACH/CHLORINE/ALLOY . . . . . 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 MPROVED PIT LATRINE . . . . . 21 PIT LATRINE WITH SLAB . . . . . 22 PIT LATRINE WITHOUT SLAB/ OPEN PIT . . . . . 23 BUCKET/PAN . . . . . 31 COMPOSTING TOILET . . . . . 41 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: Electricity? A wall clock? A radio? A black/white television? A color television? A mobile telephone? A land-line telephone? A refrigerator? A freezer? Electric generator/Invertor(s)? Washing machine? Computer? Digital photo-camera? Non-digital photo-camera? Video deck? DVD/VCD? Sewing machine? Bed? Table? Cabinet/Cupboard?	YES NO ELECTRICITY . . . . . 1 2 CLOCK . . . . . 1 2 RADIO . . . . . 1 2 BLACK/WHITE TELEVISION . . . . . 1 2 COLOR TELEVISION . . . . . 1 2 MOBILE TELEPHONE . . . . . 1 2 LAND-LINE TELEPHONE . . . . . 1 2 REFRIGERATOR . . . . . 1 2 FREEZER . . . . . 1 2 GENERATOR/INVERTOR . . . . . 1 2 WASHING MACHINE . . . . . 1 2 COMPUTER . . . . . 1 2 DIGITAL CAMERA . . . . . 1 2 NON-DIGITAL CAMERA . . . . . 1 2 VIDEO DECK . . . . . 1 2 DVD/VCD . . . . . 1 2 SEWING MACHINE . . . . . 1 2 BED . . . . . 1 2 TABLE . . . . . 1 2 CABINET/ CUPBOARD 1 2	

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
112	What type of fuel does your household mainly use for cooking?	ELECTRICITY . . . . . 01 LPG . . . . . 02 NATURAL GAS . . . . . 03 BIOGAS . . . . . 04 KEROSENE . . . . . 05 CHARCOAL . . . . . 06 WOOD/FIREWOOD . . . . . 07 STRAW/SHRUBS/GRASS . . . . . 08 AGRICULTURAL CROP RESIDUE . . . . . 09 ANIMAL DUNG . . . . . 10 NO FOOD COOKED IN HOUSEHOLD . . . . . 95 OTHER _____ 96 (SPECIFY)	→ 113A → 117
113	In this household, is food cooked on an open fire, an open stove or a closed stove?	OPEN FIRE . . . . . 1 COAL POT . . . . . 2 OPEN STOVE . . . . . 3 CLOSED STOVE/COAL POT WITH CHIMNEY . . . . . 4 OTHER _____ 6 (SPECIFY)	
113A	What type of oil does your household mainly use for cooking?	PALM OIL . . . . . 01 FRYTOL/FORTIFIED VEGETABLE OIL . . . . . 02 OTHER VEGETABLE OIL . . . . . 03 LARD OR SUET . . . . . 04 BUTTER OR MARGARINE . . . . . 05 SHEA BUTTER . . . . . 06 OTHER _____ 96 (SPECIFY)	
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 IN THE DWELLING. 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/TERRAZO . . . . . 33 CEMENT . . . . . 34 WOOLEN CARPET/SYNTHETIC CARPET . . . 35 LINOLEUM/RUBBER CARPET . . . . . 36 OTHER _____ 96 (SPECIFY)	

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
118	MAIN MATERIAL OF THE ROOF IN THE DWELLING RECORD OBSERVATION.	NATURAL ROOFING NO ROOF . . . . . 11 THATCH/PALM LEAF/SOD . . . . . 12 RUDIMENTARY ROOFING RUSTIC MAT . . . . . 21 PALM/BAMBOO . . . . . 22 WOOD PLANKS . . . . . 23 CARDBOARD . . . . . 24 FINISHED ROOFING METAL . . . . . 31 WOOD . . . . . 32 CALAMINE/CEMENT FIBER . . . . . 33 CERAMIC TILES/BRICK TILES . . . . . 34 CEMENT . . . . . 35 ROOFING SHINGLES . . . . . 36 ASBESTOS/SLATE ROOFING SHEETS . . . 37 OTHER _____ 96 (SPECIFY)	
119	MAIN MATERIAL OF THE EXTERIOR 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	
121	Does any member of this household own: A bicycle? A motorcycle or motor scooter? An animal-drawn cart? A car or truck? A boat with a motor? A boat without a motor?	YES NO BICYCLE . . . . . 1 2 MOTORCYCLE/SCOOTER . . . . . 1 2 ANIMAL-DRAWN CART . . . . . 1 2 CAR/TRUCK . . . . . 1 2 BOAT WITH MOTOR . . . . . 1 2 BOAT WITHOUT MOTOR 1 2	
122	Does any member of this household own any agricultural land?	YES . . . . . 1 NO 2	→ 124

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
123	How many hectares, acres or poles of agricultural land do members of this household own?	HECTARES . . . . . 1 ☐☐ ACRES . . . . . 2 ☐☐ POLES . . . . . 3 ☐☐ 95 OR MORE . . . . . 995 DON'T KNOW 998	
124	Does this household own any livestock, herds, other farm animals, or poultry?	YES . . . . . 1 NO 2	→ 126
125	How many of the following animals does this household own? IF NONE, ENTER '00'. IF MORE THAN 95, ENTER '95'. IF UNKNOWN, ENTER '98'.		
	Cattle?	CATTLE . . . . . ☐☐	
	Milk cows or bulls?	COWS/BULLS . . . . . ☐☐	
	Horses, donkeys, or mules?	HORSES/DONKEYS/MULES . . . . . ☐☐	
	Goats?	GOATS . . . . . ☐☐	
	Sheep?	SHEEP . . . . . ☐☐	
	Pigs?	PIGS . . . . . ☐☐	
	Rabbits?	RABBITS . . . . . ☐☐	
	Grasscutter?	GRASSCUTTER . . . . . ☐☐	
	Chickens?	CHICKENS . . . . . ☐☐	
	Other poultry? _____ (SPECIFY)	OTHER POULTRY . . . . . ☐☐	
	Other? _____ (SPECIFY)	OTHER . . . . . ☐☐	
126	Does any member of this household have a bank account?	YES . . . . . 1 NO 2	
126A	How many household members are covered by health insurance? IF NONE, RECORD '00'.	PERSONS . . . . . ☐☐ DON'T KNOW/NOT SURE 98	
127	Does your household have any mosquito nets hat can be used while sleeping?	YES . . . . . 1 NO 2	→ 137A
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 OLYSET . . . . . 10 PERMANET . . . . . 11 INTERCEPTOR . . . . . 12 NETPROTECT . . . . . 13 DURANET . . . . . 14 ICON LIFE . . . . . 15 OTHER/ DK BRAND . . . . . 16 (SKIP TO 135) 'PRETREATED' NET DAWA PLUS . . . . . 21 OTHER/ DK BRAND . . . . . 26 (SKIP TO 133) LOCALLY SEWN NETS . . . . . 31 OTHER . . . . . 41 DK BRAND 98	LONG LASTING NET OLYSET . . . . . 10 PERMANET . . . . . 11 INTERCEPTOR . . . . . 12 NETPROTECT . . . . . 13 DURANET . . . . . 14 ICON LIFE . . . . . 15 OTHER/ DK BRAND . . . . . 16 (SKIP TO 135) 'PRETREATED' NET DAWA PLUS . . . . . 21 OTHER/ DK BRAND . . . . . 26 (SKIP TO 133) LOCALLY SEWN NETS . . . . . 31 OTHER . . . . . 41 DK BRAND 98	LONG LASTING NET OLYSET . . . . . 10 PERMANET . . . . . 11 INTERCEPTOR . . . . . 12 NETPROTECT . . . . . 13 DURANET . . . . . 14 ICON LIFE . . . . . 15 OTHER/ DK BRAND . . . . . 16 (SKIP TO 135) 'PRETREATED' NET DAWA PLUS . . . . . 21 OTHER/ DK BRAND . . . . . 26 (SKIP TO 133) LOCALLY SEWN NETS . . . . . 31 OTHER . . . . . 41 DK BRAND 98
131A	Where did you get this net?	PUBLIC SECTOR GOVT. HOSPITAL/ POLYCLINIC . . . . . 11 GOVT. HEALTH CENTER . . . . . 12 GOVT. HEALTH POST/CHPS . . . . . 13 FIELDWORKER/OUTREACH/ PEER EDUCATOR . . . . . 14 CAMPAIGN . . . . . 15 OTHER PUBLIC ______ 16 (SPECIFY) PRIVATE MEDICAL SECTOR PRIVATE HOSPITAL/CLINIC . . . . . 21 PHARMACY/CHEMICAL/ DRUG STORE . . . . . 22 OTHER PRIVATE MEDICAL ______ 26 (SPECIFY) OTHER SOURCE NGO . . . . . 31 SHOP/MARKET . . . . . 32 STREET VENDOR . . . . . 33 PETROL STATION/ MOBILE MART . . . . . 34 OTHER ______ 36 (SPECIFY) DON'T KNOW 98	PUBLIC SECTOR GOVT. HOSPITAL/ POLYCLINIC . . . . . 11 GOVT. HEALTH CENTER . . . . . 12 GOVT. HEALTH POST/CHPS . . . . . 13 FIELDWORKER/OUTREACH/ PEER EDUCATOR . . . . . 14 CAMPAIGN . . . . . 15 OTHER PUBLIC ______ 16 (SPECIFY) PRIVATE MEDICAL SECTOR PRIVATE HOSPITAL/CLINIC . . . . . 21 PHARMACY/CHEMICAL/ DRUG STORE . . . . . 22 OTHER PRIVATE MEDICAL ______ 26 (SPECIFY) OTHER SOURCE NGO . . . . . 31 SHOP/MARKET . . . . . 32 STREET VENDOR . . . . . 33 PETROL STATION/ MOBILE MART . . . . . 34 OTHER ______ 36 (SPECIFY) DON'T KNOW 98	PUBLIC SECTOR GOVT. HOSPITAL/ POLYCLINIC . . . . . 11 GOVT. HEALTH CENTER . . . . . 12 GOVT. HEALTH POST/CHPS . . . . . 13 FIELDWORKER/OUTREACH/ PEER EDUCATOR . . . . . 14 CAMPAIGN . . . . . 15 OTHER PUBLIC ______ 16 (SPECIFY) PRIVATE MEDICAL SECTOR PRIVATE HOSPITAL/CLINIC . . . . . 21 PHARMACY/CHEMICAL/ DRUG STORE . . . . . 22 OTHER PRIVATE MEDICAL ______ 26 (SPECIFY) OTHER SOURCE NGO . . . . . 31 SHOP/MARKET . . . . . 32 STREET VENDOR . . . . . 33 PETROL STATION/ MOBILE MART . . . . . 34 OTHER ______ 36 (SPECIFY) DON'T KNOW 98
131B	Was a voucher used to purchase this net?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8

		NET #1	NET #2	NET #3
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
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
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, CONTINUE TO Q. 137A	GO BACK TO 129 FOR NEXT NET; OR, IF NO MORE NETS, CONTINUE TO Q. 137A	GO TO 129 IN FIRST COLUMN OF A NEW QUESTIONNAIRE; OR, IF NO MORE NETS, CONTINUE TO Q. 137A

			YES	NO
137A	In the past 12 months, have you seen or heard any messages telling you that:			
	a) The Ghana Health Service recommends Artesunate and Amodiaquine as a drug for malaria?	GHS RECOMMENDATION . . .	1	2
	b) Treatment should be sought from health facility within 24hrs of onset of fever, especially for a child under 5 years?	SEEKING URGENT CARE . . .	1	2
	c) The full course of the malaria drug Artesunate and Amodiaquine should be completed?	COMPLETING FULL COURSE . . .	1	2
	d) Pregnant women should attend ANC and take 3 doses of SP/Fansidar during pregnancy to prevent malaria?	ATTENDING ANC . . .	1	2
	e) Families should sleep under an insecticide treated mosquito net to protect them from mosquito bites that lead to malaria, especially pregnant women and children uder 5 years?	SLEEPING UNDER NET . . .	1	2
137B	In the past 12 months, have you seen or heard any of the messages about malaria:			
	a) On the television?	TELEVISION . . .	1	2
	b) On the radio?	RADIO . . .	1	2
	c) In a newspaper or magazine?	NEWSPAPER/MAGAZINE . . .	1	2
	d) From a poster?	POSTER . . .	1	2
	e) From leaflets or brochures?	LEAFLET/BROCHURE . . .	1	2
	f) From a health worker?	HEALTH WORKER . . .	1	2
	g) From a Community volunteer?	VOLUNTEER . . .	1	2
137C	Have you ever listened to the radio program "He Ha Ho"?		YES . . . 1 NO . . . 2	

SELECTION OF RESPONDENTS FOR SECTION ON DOMESTIC VIOLENCE

138 ONLY ONE PERSON PER HOUSEHOLD SHOULD BE SELECTED FOR DV MODULE

LOOK AT THE IDENTIFICATION PANEL ON THE COVER OF THE HOUSEHOLD QUESTIONNAIRE,CHECK WHETHER A WOMAN OR A MAN IS TO BE INTERVIEWED WITH THE DOMESTIC VIOLENCE MODULE IN THIS HOUSEHOLD:

WOMAN ☐

USE THE TABLE BELOW TO SELECT ONE WOMAN TO BE INTERVIEWED WITH DV MODULE IN THIS HH

NAME OF SELECTED WOMAN_____

HH LINE NUMBER ☐☐

GO TO COL. 9 IN THE HH SCHEDULE AND WRITE 'DV' NEXT TO THE LINE NUMBER OF THE WOMAN SELECTED

MAN ☐

USE THE TABLE BELOW TO SELECT ONE MAN TO BE INTERVIEWED WITH DV MODULE IN THIS HH

NAME OF SELECTED MAN_____

HH LINE NUMBER ☐☐

GO TO COL. 10 IN THE HH SCHEDULE AND WRITE 'DV' NEXT TO THE LINE NUMBER OF THE MAN SELECTED

HOW TO USE THE TABLE FOR SELECTION OF RESPONDENTS FOR DV

LOOK AT THE LAST DIGIT OF THE HOUSEHOLD QUESTIONNAIRE SERIAL NUMBER ON THE COVER PAGE. THIS IS THE ROW NUMBER YOU SHOULD GO TO. CHECK THE TOTAL NUMBER OF ELIGIBLE FEMALES (COLUMN 9) OR MALES (COLUMN 10) IN THE HOUSEHOLD SCHEDULE. THIS IS THE COLUMN YOU SHOULD GO TO. THE CELL WHERE THE ROW AND THE COLUMN MEET IS THE NUMBER OF THE SELECTED WOMAN OR MAN FOR THE DOMESTIC VIOLENCE MODULE IN THE HOUSEHOLD SCHEDULE.

FOR EXAMPLE, THE HOUSEHOLD WAS SELECTED TO INTERVIEW A WOMAN WITH THE DV MODULE AND THERE ARE THREE ELIGIBLE WOMEN AGE 15-49 (LINE NUMBERS 02, 04, AND 05). IF THE HOUSEHOLD QUESTIONNAIRE SERIAL NUMBER IS '216', THE LAST DIGIT IS "6", THEREFORE GO TO ROW '6'. THERE ARE THREE ELIGIBLE WOMEN AGE 15-49 IN THE HOUSEHOLD, THEREFORE GO TO COLUMN '3'. FOLLOW THE ROW AND COLUMN AND FIND THE NUMBER WHERE THE ROW AND COLUMN MEET ('2') AND CIRCLE THE BOX. NOW GO TO THE HOUSEHOLD SCHEDULE AND FIND THE SECOND WOMAN WHO IS ELIGIBLE FOR THE WOMAN'S INTERVIEW (LINE NUMBER "04" IN OUR EXAMPLE). WRITE HER LINE NUMBER ABOVE IN THE BOXES INDICATED.

TABLE FOR SELECTION OF RESPONDENTS FOR SECTION ON DOMESTIC VIOLENCE

LAST DIGIT OF THE HOUSEHOLD Q-RE SERIAL NUMBER	TOTAL NUMBER OF ELIGIBLE WOMEN 15-49 / MEN 15-59 IN THE HOUSEHOLD							
	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

WEIGHT HEIGHT AND HEMOGLOB N MEASUREMENT FOR CHILDREN AGE 0-5

501	CHECK COLUMN 11. RECORD THE LINE NUMBER AND AGE FOR ALL ELIGIBLE CHILDREN 0-5 YEARS N QUESTION 502. IF MORE THAN SIX CH LDREN, USE ADDITIONAL QUESTIONNAIRE(S). A FINAL OUTCOME MUST BE RECORDED FOR THE WEIGHT AND HEIGHT MEASUREMENT IN 508 AND FOR THE ANEMIA PROCEDURE IN 513			
		CHILD 1	CHILD 2	CHILD 3
502	LINE NUMBER FROM COLUMN 11 NAME FROM COLUMN 2	L NE NUMBER . . . . NAME _____	LINE NUMBER . . . . NAME _____	LINE NUMBER . . . NAME _____
503	IF MOTHER NTERVIEWED, COPY MONTH AND YEAR FROM B RTH HISTORY AND ASK DAY; IF MOTHER NOT NTERVIEWED, ASK: What is (NAME'S) birth date?	DAY . . . . . MONTH . . . . . YEAR	DAY . . . . . MONTH . . . . . YEAR	DAY . . . . . MONTH . . . . . YEAR
504	CHECK 503: CHILD BORN N JANUARY 2003 OR LATER?	YES . . . . . 1 NO . . . . . 2 (GO TO 503 FOR NEXT CH LD OR, F 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 CENT METERS	CM .	CM .	CM .
507	MEASURED LYING DOWN OR STANDING UP?	LYING DOWN . . . . . 1 STANDING UP 2	LYING DOWN . . . . . 1 STANDING UP 2	LY NG 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
509	CHECK 503: IS CHILD AGE 0-5 MONTHS, I.E., WAS CHILD BORN N MONTH OF INTERV EW OR FIVE PREVIOUS MONTHS?	0-5 MONTHS . . . . . 1 (GO TO 503 FOR NEXT CH LD OR, F NO MORE, GO TO 515) OLDER 2	0-5 MONTHS . . . . . 1 (GO TO 503 FOR NEXT CHILD OR, IF NO MORE, GO TO 515) OLDER 2	0-5 MONTHS . . . . . 1 (GO TO 503 FOR NEXT CHILD OR, IF NO MORE, GO TO 515) OLDER 2
510	LINE NUMBER OF PARENT/OTHER ADULT RESPONSIBLE FOR THE CHILD (COLUMN 1) RECORD '00' IF NOT LISTED.	L NE NUMBER	LINE NUMBER	LINE NUMBER . . .
511	READ CONSENT STATEMENT TO PARENT/OTHER ADULT RESPONSIBLE FOR CHILD. CIRCLE CODE AND SIGN.	GRANTED 1 (SIGN) REFUSED . . . . . 2 (IF REFUSED, GO TO 513)	GRANTED 1 (SIGN) REFUSED . . . . . 2 (F REFUSED, GO TO 513)	GRANTED 1 (SIGN) REFUSED . . . . . 2 (IF REFUSED, GO TO 513)
512	RECORD HEMOGLOBIN LEVEL HERE AND N THE ANEMIA PAMPHLET	G/DL . .	G/DL . .	G/DL . .
513	RECORD RESULT CODE OF HEMOGLOB N 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 N THE FIRST COLUMN OF THE ADDITIONAL QUESTIONNAIRE(S); IF NO MORE CH LDREN, GO TO 515.		

CONSENT STATEMENT FOR ANEMIA FOR CHILDREN

As part of this survey, we are asking people all over the country to take an anemia test. Anemia is a serious health problem that usually results from poor nutrition, infection, or chronic disease. This survey will assist the government to develop programs to prevent and treat anemia.

We request that all children born in 2003 or later participate in the anemia testing part of this survey and give a few drops of blood from a finger. The equipment used in taking the blood is clean and completely safe. t has never been used before and will be thrown away after each test.

The blood will be tested for anemia immediately, and the result told to you right away. The result will be kept confidential and will not be seen by anyone other than members of our survey team.

Do you have any questions?

You can say yes to the test, or you can say no. t is up to you to decide.
Will you allow (NAME(S) OF CHILD(REN) to participate in the anemia test?

WEIGHT HEIGHT AND HEMOGLOB N MEASUREMENT FOR CHILDREN AGE 0-5

		CHILD 4	CHILD 5	CHILD 6
502	LINE NUMBER FROM COLUMN 11 NAME FROM COLUMN 2	L NE NUMBER . . . . NAME _____	LINE NUMBER . . . . NAME _____	LINE NUMBER . . . NAME _____
503	IF MOTHER NTERVIEWED, COPY MONTH AND YEAR FROM B RTH HISTORY AND ASK DAY; IF MOTHER NOT NTERVIEWED, ASK: What is (NAME'S) birth date?	DAY . . . . . . MONTH . . . . . . YEAR	DAY . . . . . . MONTH . . . . . . YEAR	DAY . . . . . . MONTH . . . . . . YEAR
504	CHECK 503: CHILD BORN N JANUARY 2003 OR LATER	YES . . . . . 1 NO . . . . . 2 (GO TO 503 FOR NEXT CH LD OR, F 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 CENT METERS	CM .	CM .	CM .
507	MEASURED LYING DOWN OR STANDING UP?	LYING DOWN . . . . . 1 STANDING UP 2	LYING DOWN . . . . . 1 STANDING UP 2	LY NG 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
509	CHECK 503: IS CHILD AGE 0-5 MONTHS, I.E., WAS CHILD BORN N MONTH OF INTERV EW OR FIVE PREVIOUS MONTHS?	0-5 MONTHS . . . . . 1 (GO TO 503 FOR NEXT CH LD OR, F NO MORE, GO TO 515) OLDER 2	0-5 MONTHS . . . . . 1 (GO TO 503 FOR NEXT CHILD OR, IF NO MORE, GO TO 515) OLDER 2	0-5 MONTHS . . . . . 1 (GO TO 503 FOR NEXT CHILD OR, IF NO MORE, GO TO 515) OLDER 2
510	LINE NUMBER OF PARENT/OTHER ADULT RESPONSIBLE FOR THE CHILD (COLUMN 1) RECORD '00' IF NOT LISTED.	L NE NUMBER	LINE NUMBER	LINE NUMBER . . .
511	READ CONSENT STATEMENT TO PARENT/OTHER ADULT RESPONSIBLE FOR CHILD. CIRCLE CODE AND SIGN.	GRANTED . . . . . 1 (SIGN) REFUSED . . . . . 2 (IF REFUSED, GO TO 513)	GRANTED . . . . . 1 (SIGN) REFUSED . . . . . 2 (F REFUSED, GO TO 513)	GRANTED . . . . . 1 (SIGN) REFUSED . . . . . 2 (IF REFUSED, GO TO 513)
512	RECORD HEMOGLOBIN LEVEL HERE AND N THE ANEMIA PAMPHLET	G/DL . .	G/DL . .	G/DL . .
513	RECORD RESULT CODE OF HEMOGLOB N 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 N THE FIRST COLUMN OF ADDITIONAL QUESTIONNAIRE(S); F NO MORE CHILDREN, GO TO 515.		

WEIGHT, HEIGHT, AND HEMOGLOBIN MEASUREMENT FOR WOMEN AGE 15-49

515 CHECK COLUMN 9. RECORD THE LINE NUMBER AND NAME FOR ALL ELIG BLE WOMEN N 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 ANEMIA TEST PROCEDURE IN 528.

		WOMAN 1	WOMAN 2	WOMAN 3
516	L NE NUMBER (COLUMN 9) NAME (COLUMN 2)	LINE NUMBER . . . . . . NAME _____	L NE NUMBER . . . . . . NAME _____	L NE 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 523)	15-17 YEARS . . . . . 1 18-49 YEARS . . . . . 2 (GO TO 523)	15-17 YEARS . . . . . 1 18-49 YEARS . . . . . 2 (GO TO 523)
521	MARITAL STATUS: CHECK COLUMN 8.	CODE 4 (NEVER N UNION . . . . . 1 OTHER . . . . . 2 (GO TO 523)	CODE 4 (NEVER IN UNION . . . . . 1 OTHER . . . . . 2 (GO TO 523)	CODE 4 (NEVER IN UNION . . . . . 1 OTHER . . . . . 2 (GO TO 523)
522	RECORD LINE NUMBER OF PARENT/OTHER ADULT RESPON-SIBLE FOR ADOLESCENT. RECORD '00' IF NOT LISTED.	LINE NUMBER OF PARENT OR OTHER RESPONSIBLE ADULT . ☐☐	L NE NUMBER OF PARENT OR OTHER RESPONSIBLE ADULT . ☐☐	L NE NUMBER OF PARENT OR OTHER RESPONSIBLE ADULT . ☐☐
523	READ ANEMIA TEST CONSENT STATEMENT. FOR NEVER-IN-UNION WOMEN AGE 15-17, ASK CONSENT FROM PARENT/OTHER ADULT DENT FIED IN 522 BEFORE ASKING RESPON-DENT'S CONSENT.	GRANTED . . . . . 1 PARENT/OTHER RESPONSIBLE ADULT REFUSED . . . . . 2 RESPONDENT REFUSED . . . . . 3 _____ (SIGN) (IF REFUSED, GO TO 528).	GRANTED . . . . . 1 PARENT/OTHER RESPONSIBLE ADULT REFUSED . . . . . 2 RESPONDENT REFUSED . . . . . 3 _____ (SIGN) (F REFUSED, GO TO 528).	GRANTED . . . . . 1 PARENT/OTHER RESPONSIBLE ADULT REFUSED . . . . . 2 RESPONDENT REFUSED . . . . . 3 _____ (SIGN) (IF REFUSED, GO TO 528).

CONSENT STATEMENT FOR ANEMIA TEST

READ CONSENT STATEMENT TO EACH RESPONDENT. CIRCLE CODE '1' IN 523 F RESPONDENT CONSENTS TO THE ANEMIA TEST AND CODE '3' IF SHE REFUSES.

FOR NEVER-IN-UNION WOMEN AGE 15-17, ASK CONSENT FROM THE PARENT OR OTHER ADULT DENT FIED AS RESPONSIBLE FOR THE ADOLESCENT (SEE QUESTION 522) BEFORE ASKING THE ADOLESCENT FOR HER CONSENT. C RCLE CODE '2' IN 523 IF THE PARENT (OTHER ADULT) REFUSES. CONDUCT THE TEST ONLY F BOTH THE PARENT (OTHER ADULT) AND THE ADOLESCENT CONSENT.

As part of this survey, we are asking people all over the country to take an anemia test. Anemia is a serious health problem that usually results from poor nutrition, infection, or chronic disease. This survey will assist the government to develop programs to prevent and treat anemia.

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

The blood will be tested for anemia immediately, and the result told to you right away. The result will be kept confidential and will not be seen by anyone other than members of our survey team.

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 anemia test?

		WOMAN 1	WOMAN 2	WOMAN 3
	L NE NUMBER (COLUMN 9) NAME (COLUMN 2)	LINE NUMBER . . . . . ☐☐ NAME _____	L NE NUMBER . . . . . ☐☐ NAME _____	L NE NUMBER . . . . . ☐☐ NAME _____
524	PREGNANCY STATUS: CHECK 226 IN WOMAN'S QUESTIONNAIRE OR ASK: Are you pregnant?	YES . . . . . 1 NO . . . . . 2 DK 8	YES . . . . . 1 NO . . . . . 2 DK 8	YES . . . . . 1 NO . . . . . 2 DK 8 2
526	CHECK 523 AND PREPARE EQUIPMENT AND SUPPLIES FOR THE TEST(S) FOR WHICH CONSENT HAS BEEN OBTAINED AND PROCEED WITH THE TEST(S). A FINAL OUTCOME FOR THE THE ANEMIA TEST PROCEDURE MUST BE RECORDED IN 528 FOR EACH ELIGIBLE WOMAN EVEN F SHE WAS NOT PRESENT, REFUSED, OR COULD NOT BE TESTED FOR SOME OTHER REASON.			
527	RECORD HEMO-GLOB N LEVEL HERE AND N ANEMIA PAMPHLET	G/DL . . . . . ☐☐.☐	G/DL . . . . . ☐☐.☐	G/DL . . . . . ☐☐.☐
528	RECORD RESULT CODE OF HEMO-GLOBIN MEASURE-MENT.	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
530D	GO BACK TO 517 IN NEXT COLUMN IN THIS QUESTIONNAIRE OR IN THE F RST COLUMNS OF ADDITIONAL QUESTIONNA RE(S); IF NO MORE END			

SEPTEMBER 2008

GHANA DEMOGRAPHIC AND HEALTH SURVEY
WOMAN'S QUESTIONNAIRE

MINISTRY OF HEALTH, GHANA — GHANA STATISTICAL SERVICE

IDENTIFICATION

LOCALITY NAME _____

NAME OF HOUSEHOLD HEAD _____

EA NUMBER . . . . . | | | |

STRUCTURE NUMBER . . . . . | | | |

HOUSEHOLD NUMBER . . . . . | | | |

REGION . . . . . | |

DISTRICT . . . . . | |

URBAN/RURAL (URBAN = 1; RURAL = 2) . . . . . |_|

CITY/LARGE TOWN/SMALL TOWN/VILLAGE(CITY=1, LARGE TOWN=2, SMALL TOWN=3, VILLAGE=4) |_|

NAME AND LINE NUMBER OF WOMAN _____ | | |

WOMAN SELECTED FOR DV INTERVIEW (YES = 1; NO = 2) . . . . . |_|

CHECK COLUMN 9 IN HOUSEHOLD QUESTIONNAIRE. IF BOX IS MARKED 'DV' RECORD 1.
MAKE SURE LINE NUMBER CORRESPONDS TO THE WOMAN'S LINE NUMBER SELECTED FOR DV.

INTERVIEWER VISITS

	1	2	3	FINAL VISIT
DATE	_____	_____	_____	DAY
				MONTH
				YEAR 2008
INTERVIEWER'S NAME	_____	_____	_____	INT. NUMBER
RESULT*	_____	_____	_____	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 OF QUESTIONNAIRE: 1 LANGUAGE OF INTERVIEW: |_| LANGUAGE OF RESPONDENT |_|

LANGUAGE CODES: ENGLISH = 1, AKAN = 2, GA = 3, EWE = 4, NZEMA = 5, DAGBANI = 6, OTHER = 7 (SPECIFY) _____

TRANSLATOR USED: (YES = 1, NO = 2) |_|

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

SECTION 1. RESPONDENT'S BACKGROUND

INTRODUCTION AND CONSENT

INFORMED CONSENT

Hello. My name is _____ and I am working for Ghana Statistical Service and Ministry of Health.
We are conduc ing a national survey that asks women and men about various heal h issues. We would very much appreciate your participa ion in his survey. This informaiton will help the government to plan health services.
The survey usually takes between 45 and 60 minutes to complete. Whatever informa ion you provide will be kept strictly confidential and will not be shown to anyone other than members of our survey team.

Par icipation 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	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	→ 104
103	Just before you moved here, did you live in a city, in a town, or in the countryside?	CITY . . . . . 1 TOWN . . . . . 2 COUNTRYSIDE 3	
104	In the last 12 months, on how many separate occasions have you traveled away from your home community and slept away?	NUMBER OF TRIPS . . . . . ☐☐ NONE 00	→ 106
105	In the last 12 months, have you been away from your home community for more than one month at a time?	YES . . . . . 1 NO 2	
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 bir hday? 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, middle/JSS, secondary/SSS, or higher?	PRIMARY . . . . . 1 MIDDLE/JSS . . . . . 2 SECONDARY/SSS . . . . . 3 HIGHER 4	
110	What is the highest grade you completed at that level?	GRADE . . . . . ☐☐	
111	CHECK 109: PRIMARY OR MIDDLE/JSS ☐ ↓ SECONDARY/SSS OR HIGHER ☐ →		115

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
112	Now I would like you to read this sentence to me. SHOW LITERACY CARD 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 MPAIRED 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?	CATHOLIC . . . . . 01 ANGLICAN . . . . . 02 METHODIST . . . . . 03 PRESBYTERIAN . . . . . 04 PENTECOSTAL/CHARISMATIC . . . . . 05 OTHER CHRISTIAN . . . . . 06 MOSLEM . . . . . 07 TRADITIONAL/SPIRITUALIST . . . . . 08 NO RELIGION . . . . . 09 OTHER _____ 96 (SPECIFY)	
119	To which ethnic group do you belong?	AKAN . . . . . 01 GA/DANGME . . . . . 02 EWE . . . . . 03 GUAN . . . . . 04 MOLE-DAGBANI . . . . . 05 GRUSSI . . . . . 06 GRUMA . . . . . 07 MANDE . . . . . 08 OTHER _____ 96 (SPECIFY)	

SECTION 2. REPRODUCTION

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
201	Now I would like to ask about all the 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	Have you ever given birth to a boy or girl 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 CH LD (RECORD '00' IF CHILD NOT LISTED IN HOUSE-HOLD).	220 IF DEAD: How old was (NAME) when he/she died? F '1 YR', PROBE: How many months old was (NAME)? RECORD DAYS F LESS THAN 1 MONTH; MONTHS IF LESS THAN TWO YEARS; OR YEARS.	221 Were there any other live births between (NAME OF PREVIOUS B RTH) 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 CH LD (RECORD '00' IF CHILD NOT LISTED IN HOUSE-HOLD).	220 IF DEAD: How old was (NAME) when he/she died? F '1 YR', PROBE: How many months old was (NAME)? RECORD DAYS F LESS THAN 1 MONTH; MONTHS IF LESS THAN TWO YEARS; OR YEARS.	221 Were there any other live births between (NAME OF PREVIOUS B RTH) 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 (PAGE W-63). 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 (PAGE W-63), 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 (PAGE W-63) 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 (PAGE W-63) 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 me hods 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 STER LIZATION 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	DIAPHRAGM Women can place a thin flexible disk in their vagina before sexual intercourse.	YES . . . . . 1 NO 2	YES . . . . . 1 NO 2
10	FOAM OR JELLY Women can place a suppository, jelly, or cream in their vagina before sexual intercourse	YES . . . . . 1 NO 2	YES . . . . . 1 NO 2
11	RHYTHM (CALENDAR) 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
12	WITHDRAWAL Men can be careful and pull out before climax.	YES . . . . . 1 NO 2	YES . . . . . 1 NO 2
13	LACTATIONAL AMENORRHEA METHOD (LAM)	YES . . . . . 1 NO 2	YES . . . . . 1 NO 2
14	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
15	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 any hing or tried in any way to delay or avoid getting pregnant?	YES . . . . . 1 NO 2	→ 306
305	ENTER '0' IN THE CALENDAR (PAGE W-63) 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 PILL . . . . . C IUD . . . . . D INJECTABLES . . . . . E IMPLANTS . . . . . F MALE CONDOM . . . . . G FEMALE CONDOM . . . . . H DIAPHRAGM . . . . . I FOAM/JELLY . . . . . J LACTATIONAL AMEN. METHOD . . . . . K RHYTHM METHOD . . . . . L WITHDRAWAL . . . . . M OTHER _____ X (SPECIFY)	→ 319 → 315 → 315 → 319A
312	RECORD IF CODE 'C' FOR PILL IS CIRCLED IN 311. YES (USING PILL) ☐ ↓ May I see the package of pills you are using? NO (USING CONDOM BUT NOT PILL) ☐ ↓ 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	

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
314	How many (pill cycles/condoms) did you get the last time?	NUMBER OF PILL CYCLES/CONDOMS . ☐☐☐ DON'T KNOW 998	
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 . . . . . 99.95 DON'T KNOW 99.98	→ 319A
319	In what month and year was the sterilization performed?	MONTH . . . . . ☐☐ YEAR . . . . . ☐☐☐☐	
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?		
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).		
321	CHECK 319/319A: YEAR IS 2003 OR LATER ☐ ENTER CODE FOR METHOD USED IN MONTH OF INTERVIEW IN THE CALENDAR (PAGE W-63) AND IN EACH MONTH UP TO THE DATE STARTED USING. YEAR IS 2002 OR EARLIER ☐ ENTER CODE FOR METHOD USED IN MONTH OF INTERVIEW IN THE CALENDAR (PAGE W-63) AND IN EACH MONTH UP 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 (PAGE W-63) 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 me hod 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 MPLANTS . . . . . 06 MALE CONDOM . . . . . 07 FEMALE CONDOM . . . . . 08 DIAPHRAGM . . . . . 09 FOAM/JELLY . . . . . 10 LACTATIONAL AMEN. METHOD . . . 11 → 324A RHYTHM METHOD . . . . . 12 → 324A WITHDRAWAL . . . . . 13 → 335 OTHER METHOD . . . . . 96 → 335	

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
324	Where did you obtain (CURRENT METHOD) when you started using it?	PUBLIC SECTOR GOVT. HOSPITAL/POLYCLINIC . . . 11 GOVT. HEALTH CENTER . . . . . 12 GOVT. HEALTH POST/CHPS . . . . . 13 FAMILY PLANNING CLINIC . . . . . 14 MOBILE CLINIC . . . . . 15 FIELDWORKER/OUTREACH/ PEER EDUCATOR . . . . . 16 OTHER PUBLIC _____ 17 (SPECIFY)	
324A	Where did you learn how to use the rhythm/lactational amenorhea method? IF UNABLE TO DETERMINE IF HOSPITAL, HEALTH CENTER, OR CLINIC IS PUBLIC OR PRIVATE MEDICAL, WRITE THE NAME OF THE PLACE. _____ (NAME OF PLACE)	PRIVATE MEDICAL SECTOR PRIVATE HOSPITAL/CLINIC . . . . . 21 PRIVATE DOCTOR . . . . . 22 PHARMACY . . . . . 23 CHEMICAL/DRUG STORE . . . . . 24 FP/PPAG CLINIC . . . . . 25 MATERNITY HOME . . . . . 26 OTHER PRIVATE MEDICAL _____ 27 (SPECIFY) OTHER SOURCE SHOP/MARKET . . . . . 31 CHURCH . . . . . 32 COMMUNITY VOLUNTEER . . . . . 33 FRIEND/RELATIVE . . . . . 34 OTHER _____ 96 (SPECIFY) DON'T KNOW 98	

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 MPLANTS . . . . . 06 MALE CONDOM . . . . . 07 FEMALE CONDOM . . . . . 08 DIAPHRAGM . . . . . 09 FOAM/JELLY . . . . . 10 LACTATIONAL AMEN. METHOD . . . 11 RHYTHM METHOD 12	→ 332 → 329 → 329 → 329 → 335 → 335
326	You obtained (CURRENT METHOD FROM 323) from (SOURCE OF METHOD FROM 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 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 me hods 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 MPLANTS . . . . . 06 MALE CONDOM . . . . . 07 FEMALE CONDOM . . . . . 08 DIAPHRAGM . . . . . 09 FOAM/JELLY . . . . . 10 LACTATIONAL AMEN. METHOD . . . 11 RHYTHM METHOD . . . . . 12 WITHDRAWAL . . . . . 13 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 GOVT. HOSPITAL/POLYCLINIC . . . 11 GOVT. HEALTH CENTER . . . . . 12 GOVT. HEALTH POST/CHPS . . . . . 13 FAMILY PLANNING CLINIC . . . . . 14 MOBILE CLINIC . . . . . 15 FIELDWORKER/OUTREACH/ PEER EDUCATOR . . . . . 16 OTHER PUBLIC _____ 17 (SPECIFY) PRIVATE MEDICAL SECTOR PRIVATE HOSPITAL/CLINIC . . . . . 21 PRIVATE DOCTOR . . . . . 22 PHARMACY . . . . . 23 CHEMICAL/DRUG STORE . . . . . 24 FP/PPAG CLINIC . . . . . 25 MATERNITY HOME . . . . . 26 OTHER PRIVATE MEDICAL _____ 27 (SPECIFY) OTHER SOURCE SHOP/MARKET . . . . . 31 CHURCH . . . . . 32 COMMUNITY VOLUNTEER . . . . . 33 FRIEND/RELATIVE . . . . . 34 OTHER _____ 96 (SPECIFY) DON'T KNOW 98	→ 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 GOVT. HOSPITAL/POLYCLINIC . . . A GOVT. HEALTH CENTER . . . . . B GOVT. HEALTH POST/CHPS . . . . . C FAMILY PLANNING CLINIC . . . . . D MOBILE CLINIC . . . . . E FIELDWORKER/OUTREACH/ PEER EDUCATOR . . . . . F OTHER PUBLIC _____ G (SPECIFY) PRIVATE MEDICAL SECTOR PRIVATE HOSPITAL/CLINIC . . . . . H PRIVATE DOCTOR . . . . . I PHARMACY . . . . . J CHEMICAL/DRUG STORE K FP/PPAG CLINIC . . . . . L MATERNITY HOME . . . . . M OTHER PRIVATE MEDICAL _____ N (SPECIFY) OTHER SOURCE SHOP/MARKET . . . . . O CHURCH . . . . . P COMMUNITY VOLUNTEER . . . . . Q FRIEND/RELATIVE . . . . . R 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 N 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 B RTH IN 2003 OR LATER. ASK THE QUESTIONS ABOUT ALL OF THESE B RTHS. BEGIN WITH THE LAST BIRTH. (F THERE ARE MORE THAN 3 B RTHS, USE LAST 2 COLUMNS OF ADDITIONAL QUESTIONNA RES). 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 B RTH 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 (SK P TO 407) LATER . . . . . 2 NOT AT ALL . . . . . 3 (SK P 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 IDENT FY EACH TYPE OF PERSON AND RECORD ALL MENTIONED.	HEALTH PERSONNEL DOCTOR . . . . . A NURSE/MIDWIFE . B AUXILIARY M DWIFE . . . . . C COMMUNITY HEALTH OFFICER/NURSE D OTHER PERSON TRA NED TRADITIONAL B RTH ATTENDANT . . . F UNTRAINED TRADITIONAL BIRTH ATTENDANT . . . G COMMUNITY/VILLAGE HEALTH VOLUNTEER . . . . H TRADITIONAL PRACTICIONER I OTHER_____ X (SPECIFY) NO ONE . . . . . Y (SK P TO 414)		

NO.	QUESTIONS AND FILTERS	LAST BIRTH NAME _____	NEXT-TO-LAST BIRTH NAME _____	SECOND-FROM-LAST B RTH NAME _____
408	Where did you receive antenatal care for this pregnancy? Anywhere else? PROBE TO IDENT FY TYPE(S) OF SOURCE(S) AND C RCLE 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 YOUR HOME . . . . A OTHER HOME . . . . B PUBLIC SECTOR GOVT. HOSPITAL/ POLYCLINIC . C GOVT. HEALTH CENTER . . . . . D GOVT. HEALTH POST/CHPS . E MOBILE CL NIC F OTHER PUBLIC _____ G (SPEC FY) PRIVATE MED. SECTOR PVT. HOSPITAL/ CLINIC . . . . . H FP/PPAG CLINIC . I MOBILE CL NIC J MATERNITY HOME K OTHER PRIVATE MED. _____ L (SPECIFY) 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? Were you weighed? Was your blood pressure measured? Did you give a urine sample? Did you give a blood sample?	YES NO WEIGHT . . . 1 2 BP . . . . . 1 2 URINE . . . . . 1 2 BLOOD . . . 1 2		
412	During (any of) your antenatal care visit(s), were you told about the signs of pregnancy complications?	YES . . . . . 1 NO . . . . . 2 (SK P 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 (SK P TO 417) ← DON'T KNOW 8		
415	During this pregnancy, how many times did you get this tetanus injection?	T MES . . . . . ☐ DON'T KNOW 8		

NO.	QUESTIONS AND FILTERS	LAST BIRTH NAME _____	NEXT-TO-LAST BIRTH NAME _____	SECOND-FROM-LAST B RTH NAME _____
416	CHECK 415:	2 OR MORE T MES ☐ → (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 (SK P 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, RECORD '7'.	T MES . . . . . ☐☐ 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 ☐☐☐☐ (SK P 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 (SK P 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 APPROX MATE 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		
426	During this pregnancy, did you take any drugs to keep you from getting malaria?	YES . . . . . 1 NO . . . . . 2 (SK P TO 432) ← DON'T KNOW 8		

NO.	QUESTIONS AND FILTERS	LAST BIRTH NAME ________	NEXT-TO-LAST BIRTH NAME ________	SECOND-FROM-LAST B RTH NAME ________
427	What drugs did you take? RECORD ALL MENTIONED. IF TYPE OF DRUG IS NOT DETERMINED, SHOW TYPICAL ANTIMALARIAL DRUGS TO RESPONDENT.	SP/FANS DAR/ MALAFAN .... A CHLOROQUINE .... B PROGUAN L .... C DARAPRIM ...... D OTHER ________ X (SPECIFY) DON'T KNOW .... Z		
428	CHECK 427: DRUGS TAKEN FOR MALARIA PREVENTION.	CODE 'A' CIRCLED ☐ CODE A' NOT C RCLED ☐ (SKIP TO 432)		
429	How many times did you take (SP/Fansidar/Malafan) during this pregnancy?	T MES ..... ☐☐		
430	CHECK 407: ANTENATAL CARE FROM HEALTH PERSONNEL DURING THIS PREGNANCY	CODE 'A', B', 'C' OR 'D' CIRCLED ☐ OTHER ☐ (SKIP TO 432)		
431	Did you get the (SP/Fansidar/Malafan) 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 (SK P 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 K LOGRAMS 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

NO.	QUESTIONS AND FILTERS	LAST BIRTH NAME _____	NEXT-TO-LAST BIRTH NAME _____	SECOND-FROM-LAST B RTH NAME _____
435	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 DETERMINE WHETHER ANY ADULTS WERE PRESENT AT THE DELIVERY.	HEALTH PERSONNEL DOCTOR . . . . . A NURSE/MIDWIFE . B AUXILIARY M DWIFE . . . . . C COMMUNITY HEALTH OFFICER/NURSE D OTHER PERSON TRA NED TRADITIONAL B RTH ATTENDANT . . . E UNTRAINED TRADITIONAL BIRTH ATTENDANT . . . F COMMUNITY/VILLAGE HEALTH VOLUNTEER . . . . G TRADITIONAL PRACTICIONER H OTHER X (SPECIFY) NO ONE . . . . . Y	HEALTH PERSONNEL DOCTOR . . . . . A NURSE/MIDWIFE B AUX LIARY MIDW FE . . . . . C COMMUNITY HEALTH OFFICER/NURSE D OTHER PERSON TRAINED TRADITIONAL BIRTH ATTENDANT . E UNTRAINED TRADITIONAL BIRTH ATTENDANT . F COMMUNITY/V LLAGE HEALTH VOLUNTEER . . G TRADITIONAL PRACTICIONER G OTHER X (SPECIFY) NO ONE . . . . . Y	HEALTH PERSONNEL DOCTOR . . . . . A NURSE/MIDWIFE B AUXILIARY M DWIFE . . . . . C COMMUNITY HEALTH OFFICER/NURSE D OTHER PERSON TRA NED TRADITIONAL B RTH ATTENDANT . E UNTRA NED TRADITIONAL BIRTH ATTENDANT . F COMMUNITY/VILLAGE HEALTH VOLUNTEER . . G TRADITIONAL PRACTICIONER G OTHER X (SPECIFY) NO ONE . . . . . Y
436	Where did you give birth to (NAME)? PROBE TO IDENT FY 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 (SK P TO 443) PUBLIC SECTOR GOVT. HOSPITAL/ POLYCLINIC . . . 21 GOVT. HEALTH CENTER . . . . . 22 GOVT. HEALTH POST/CHPS . . . 23 OTHER PUBLIC _____ 26 (SPEC FY) PRIVATE MED. SECTOR PVT. HOSPITAL/ CLINIC . . . . . 31 FP/PPAG CLINIC 32 MATERNITY HOME 33 OTHER PRIVATE MED._____ 36 (SPECIFY) OTHER_____ 96 (SPECIFY) (SKIP TO 443)	HOME YOUR HOME . . . 11 OTHER HOME . . . 12 (SKIP TO 444) PUBLIC SECTOR GOVT. HOSPITAL/ POLYCLINIC . 21 GOVT. HEALTH CENTER . . . . . 22 GOVT. HEALTH POST/CHPS . 23 OTHER PUBLIC _____ 26 (SPEC FY) PRIVATE MED. SECTOR PVT. HOSPITAL/ CLINIC . . . . . 31 FP/PPAG CLINIC 32 MATERNITY HOME 33 OTHER PRIVATE MED._____ 36 (SPECIFY) OTHER_____ 96 (SPECIFY) (SK P TO 444)	HOME YOUR HOME . . . 11 OTHER HOME . . . 12 (SKIP TO 444) PUBLIC SECTOR GOVT. HOSPITAL/ POLYCLINIC . 21 GOVT. HEALTH CENTER . . . . . 22 GOVT. HEALTH POST/CHPS . 23 OTHER PUBLIC _____ 26 (SPECIFY) PRIVATE MED. SECTOR PVT. HOSPITAL/ CLINIC . . . . . 31 FP/PPAG CLINIC 32 MATERNITY HOME 33 OTHER PRIVATE MED._____ 36 (SPECIFY) OTHER_____ 96 (SPEC FY) (SKIP TO 444)
437	How long after (NAME) was delivered did you stay there? IF LESS THAN ONE DAY, RECORD HOURS. IF LESS THAN ONE WEEK, RECORD DAYS.	HOURS 1 ☐☐ DAYS 2 ☐☐ WEEKS 3 ☐☐ DON'T KNOW . 998	HOURS 1 ☐☐ DAYS 2 ☐☐ WEEKS 3 ☐☐ DON'T KNOW . . . 998	HOURS 1 ☐☐ DAYS 2 ☐☐ WEEKS 3 ☐☐ DON'T KNOW . . . 998
438	Was (NAME) delivered by caesarean section?	YES . . . . . 1 NO 2	YES . . . . . 1 NO 2	YES . . . . . 1 NO 2
439	Before you were discharged after (NAME) was born, did any health care provider check on your health?	YES . . . . . 1 NO . . . . . 2 (SK P TO 442)	YES . . . . . 1 (SKIP TO 455) NO 2	YES . . . . . 1 (SKIP TO 455) NO 2
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		

NO.	QUESTIONS AND FILTERS	LAST BIRTH NAME _____	NEXT-TO-LAST BIRTH NAME _____	SECOND-FROM-LAST B RTH NAME _____
441	Who checked on your health at that time? PROBE FOR MOST QUALIFIED PERSON.	HEALTH PERSONNEL DOCTOR . . . . . 11 NURSE/MIDWIFE 12 AUXILIARY M DWIFE . . . . . 13 COMMUNITY HEALTH OFFICER/NURSE 14 OTHER PERSON TRA NED TRADITIONAL B RTH ATTENDANT . . . 21 UNTRAINED TRADITIONAL BIRTH ATTENDANT . . . 22 COMMUNITY/ V LLAGE HEALTH VOLUNTEER . . . . 23 TRADITIONAL PRACTICIONER 24 RELATIVE/FR END 25 OTHER _____ 96 (SPECIFY) (SK P 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.	COSTS TOO MUCH . . . A FACILITY NOT OPEN . . B TOO FAR/ NO TRANSPORTATION . C DON'T TRUST FACILITY/POOR QUALITY SERVICE . D NO FEMALE PROVID-ER AT FACILITY . . . E NOT THE FIRST CHILD. . F NOT NECESSARY . . . G FATHER DIDN'T THINK IT WAS NECESSARY . H FAMILY DIDN'T THINK IT WAS NECESSARY . I HUSBAND/FAMILY DID NOT ALLOW . . . . J NOT CUSTOMARY . . . . K DID NOT KNOW WHERE TO GO . . . . . L NO ONE TO ACCOMPANY M INCONVENIENT SERVICE HOUR . . . . . N AFRAID TO GO . . . . . O LONG WAITING TIME . P 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 B RTH NAME _____
446	Who checked on your health at that time? PROBE FOR MOST QUALIFIED PERSON.	HEALTH PERSONNEL DOCTOR . . . . . 11 NURSE/MIDWIFE 12 AUXILIARY M DWIFE . . . . . 13 COMMUNITY HEALTH OFFICER/NURSE 14 OTHER PERSON TRA NED TRADITIONAL B RTH ATTENDANT . . . . 21 UNTRAINED TRADITIONAL BIRTH ATTENDANT . . . . 22 COMMUNITY/ V LLAGE HEALTH VOLUNTEER . . . . 23 TRADITIONAL PRACTICIONER 24 RELATIVE/FR END 25 OTHER_____ 96 (SPECIFY)		
447	Where did this first check take place? PROBE TO IDENT FY 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/ POLYCLINIC .... . 21 GOVT. HEALTH CENTER . . . . . 22 GOVT. HEALTH POST/CHPS .... . 23 OTHER PUBLIC _____ 26 (SPEC FY) PRIVATE MED. SECTOR PVT. HOSPITAL/ CLINIC . . . . . 31 MOBILE CL NIC . . 32 FP/PPAG CLNIC . . 33 MATERNITY HOME 34 OTHER PRIVATE MED._____ 36 (SPECIFY) OTHER_____ 96 (SPECIFY)		
448	CHECK 442:	YES ☐ NOT ASKED ☐ (SKIP TO 453)		
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 (SK P 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.	HRS AFTER BIRTH . . 1 ☐☐ DAYS AFTER BIRTH . . 2 ☐☐ WKS AFTER BIRTH . . 3 ☐☐ DON'T KNOW 998		

NO.	QUESTIONS AND FILTERS	LAST BIRTH NAME _____	NEXT-TO-LAST BIRTH NAME _____	SECOND-FROM-LAST B RTH NAME _____
451	Who checked on (NAME)'s health at that time? PROBE FOR MOST QUALIFIED PERSON.	HEALTH PERSONNEL DOCTOR . . . . . 11 NURSE/MIDWIFE 12 AUXILIARY M DWIFE . . . . . 13 COMMUNITY HEALTH OFFICER/NURSE 14 OTHER PERSON TRA NED TRADITIONAL B RTH ATTENDANT . . . . 21 UNTRAINED TRADITIONAL BIRTH ATTENDANT . . . . 22 COMMUNITY/ V LLAGE HEALTH WORKER . . . . . 23 TRADITIONAL PRACTICIONER 24 RELATIVE/FR END 25 OTHER_____ 96 (SPECIFY)		
452	Where did this first check of (NAME) take place? PROBE TO IDENT FY 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/ POLYCLINIC .... . 21 GOVT. HEALTH CENTER . . . . . 22 GOVT. HEALTH POST/CHPS . . . . 23 OTHER PUBLIC _____ 26 (SPEC FY) PRIVATE MED. SECTOR PVT. HOSPITAL/ CLINIC . . . . . 31 MOBILE CL NIC . . . . 32 FP/PPAG CLNIC . . 33 MATERNITY HOME 34 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/any of these)? SHOW COMMON TYPES OF AMPULES/CAPSULES/SYRUPS.	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8		

NO.	QUESTIONS AND FILTERS	LAST BIRTH NAME _____	NEXT-TO-LAST BIRTH NAME _____	SECOND-FROM-LAST B RTH NAME _____
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 (SK P 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
457	CHECK 226: IS RESPONDENT PREGNANT?	NOT PREG-NANT ☐ PREGNANT OR ☐ UNSURE (SK P 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 <u>not</u> 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 (SK P 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.	MMEDIATELY . . . . . 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 PLA N WATER . . . . B SUGAR OR GLU-COSE WATER . . . . C GRIPE WATER . . . . D SUGAR-SALT-WATER SOLUTION . . . . . E FRUIT JUICE . . . . . F NFANT FORMULA . G TEA/ NFUSIONS . . . . H HONEY . . . . . I OTHER _____ X (SPECIFY)		

NO.	QUESTIONS AND FILTERS	LAST BIRTH NAME _____	NEXT-TO-LAST BIRTH NAME _____	SECOND-FROM-LAST B RTH NAME _____
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 . . . ST LL BF . . . . . 95 DON'T KNOW . . . 98
467	CHECK 404: IS CHILD LIVING?	LIVING DEAD (GO BACK TO 405 IN NEXT COLUMN; OR, F NO MORE BIRTHS, GO TO 501) (SK P TO 470)	LIVING DEAD (GO BACK TO 405 N NEXT COLUMN; OR, IF NO MORE BIRTHS, GO TO 501) (SKIP TO 470)	LIVING DEAD (GO BACK TO 405 IN NEXT-TO-LAST COLUMN OF NEW QUESTIONNA RE; OR, IF NO MORE BIRTHS, GO TO 501) (SK P TO 470)
468	How many times did you breastfeed last night between sunset and sunrise? IF ANSWER IS NOT NUMERIC, PROBE FOR APPROX MATE NUMBER.	NUMBER OF NIGHTTIME FEED NGS .		
469	How many times did you breastfeed yesterday during the daylight hours? IF ANSWER IS NOT NUMERIC, PROBE FOR APPROX MATE NUMBER.	NUMBER OF DAYLIGHT FEED NGS .		
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 N NEXT COLUMN; OR, F NO MORE BIRTHS, GO TO 501.	GO BACK TO 405 IN NEXT-TO-LAST COLUMN OF NEW QUESTIONNAIRE; OR, F NO MORE BIRTHS, GO TO 501.

SECTION 5. CHILD IMMUNIZATION AND HEALTH AND CHILD'S AND WOMAN'S NUTRITION

501	ENTER IN THE TABLE THE LINE NUMBER, NAME, AND SURVIVAL STATUS OF EACH BIRTH IN 2003OR 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).			
502	LINE NUMBER FROM 212	LAST BIRTH LINE NUMBER	NEXT-TO-LAST BIRTH LINE NUMBER	SECOND-FROM-LAST BIRTH 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 card where (NAME'S) vaccinations are written down? 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		
POLIO 0 (POLIO GIVEN AT BIRTH)				P0			P0		
POLIO 1				P1			P1		
POLIO 2				P2			P2		
POLIO 3				P3			P3		
DPT/HEP B/INFL 1				DPTH1			DPTH1		
DPT/HEP B/INFL 2				DPTH2			DPTH2		
DPT/HEP B/INFL 3				DPTH3			DPTH3		
MEASLES				MEA/			MEA/		
YELLOW FEVER				YF			YF		
VITAMIN A (MOST RECENT)				VIT A1			VIT A1		
VITAMIN A (2nd MOST RECENT)				VIT A2			VIT A2		

506A	CHECK 506:	BCG TO YELLOW FEVER ALL RECORDED / OTHER (GO TO 510)	BCG TO YELLOW FEVER ALL RECORDED / OTHER (GO TO 510)	BCG TO YELLOW FEVER ALL RECORDED / OTHER (GO TO 510)

NO.	QUESTIONS AND FILTERS	LAST BIRTH NAME _____	NEXT-TO-LAST B RTH NAME _____	SECOND-FROM-LAST B RTH 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 F RESPONDENT MENTIONS BCG, POLIO 0-3, DPT/Hep/Infl.B, YELLOW FEVER AND/OR MEASLES VACCINES.	YES . . . . . 1 (PROBE FOR VACC NATIONS 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 VACC NATIONS AND WRITE '66' N THE CORRESPONDING DAY COLUMN IN 506) (SKIP TO 510) NO . . . . . 2 (SK P TO 510) DON'T KNOW 8	YES . . . . . 1 (PROBE FOR VACCINATIONS AND WRITE '66' IN THE CORRESPOND NG 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 (SK P 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 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 (SK P 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 T MES	NUMBER OF TIMES . . . . .
509E	A DPT/Hep B/Influenza vaccination, that is, an injection given in the thigh, to prevent him/her from getting tetanus, whooping cough, diphtheria, sometimes given at the same time as polio?	YES . . . . . 1 NO . . . . . 2 (SK P 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 DPT/ HepB/Influenza vaccination received?	NUMBER OF TIMES	NUMBER OF T MES	NUMBER OF TIMES . . . . .
509G	A measles injection - that is, a shot in the 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
509H	An injection to prevent yellow fever- a shot in the arm at the age of 9 months or older (sometimes given at the same time as 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 VACC NATION IN THE LAST 2 YRS. 3 DON'T KNOW . . . . . 8 (SKIP TO 512)	YES . . . . . 1 NO . . . . . 2 NO VACCINATION IN THE LAST 2 YRS. 3 DON'T KNOW . . . . . 8 (SK P TO 512)	YES . . . . . 1 NO . . . . . 2 NO VACCINATION IN THE LAST 2 YRS. 3 DON'T KNOW . . . . . 8 (SKIP TO 512)

NO.	QUESTIONS AND FILTERS	LAST BIRTH NAME _____	NEXT-TO-LAST B RTH NAME _____	SECOND-FROM-LAST B RTH NAME _____
511	At which national immunization day campaigns did (NAME) receive vaccinations? RECORD ALL CAMPAIGNS MENTIONED.	INTEGRATED MEASLES/ POLIO (NOVEMBER 2006) . . . . . A IMC /CHILD HEALTH CAMPAIGN (NOV. 2007) . . . . . B	INTEGRATED MEASLES/ POLIO (NOVEMBER 2006) . . . . . A IMCI/CHILD HEALTH CAMPAIGN (NOV. 2007) . . . . . B	INTEGRATED MEASLES/ POLIO (NOVEMBER 2006) . . . . . A IMCI/CH LD HEALTH CAMPAIGN (NOV. 2007) . . . . . B
512	CHECK 506: DATE SHOWN FOR VITAM N A DOSE	DATE FOR MOST RECENT VITAMIN A DOSE OTHER (SKIP TO 514)	DATE FOR MOST RECENT VITAM N A DOSE OTHER (SKIP TO 514)	DATE FOR MOST RECENT VITAM N A DOSE OTHER (SK P 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.	YES . . . . . 1 (SKIP TO 515) NO . . . . . 2 (SKIP TO 516) DON'T KNOW 8	YES . . . . . 1 (SK P TO 515) NO . . . . . 2 (SK P 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.	YES . . . . . 1 NO . . . . . 2 (SKIP TO 516) DON'T KNOW 8	YES . . . . . 1 NO . . . . . 2 (SK P 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/SPR NKLES/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 diarrhea in the last 2 weeks?	YES . . . . . 1 NO . . . . . 2 (SKIP TO 533) DON'T KNOW 8	YES . . . . . 1 NO . . . . . 2 (SK P 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

NO.	QUESTIONS AND FILTERS	LAST BIRTH NAME ________	NEXT-TO-LAST B RTH NAME ________	SECOND-FROM-LAST B RTH NAME ________
520	Now I would like to know how much (NAME) was given to drink during the diarrhea (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 DR NK 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
521	When (NAME) had diarrhea, 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 diarrhea from any source?	YES .... 1 NO .... 2 (SKIP TO 527)	YES .... 1 NO .... 2 (SKIP TO 527)	YES .... 1 NO .... 2 (SK P 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 NAME OF THE PLACE. ________ (NAME OF PLACE(S))	PUBLIC SECTOR GOVT HOSPITAL/ POLYCL NIC . A GOVT HEALTH CENTER ..... B GOVT HEALTH POST/CHPS . C MOB LE CLINIC . D FIELDWORKER . E OTHER PUBLIC ________ F (SPECIFY) PRIVATE MEDICAL SECTOR PVT. HOSPITAL/ CLINIC .... G PHARMACY ... H PVT DOCTOR ... I MOB LE CLINIC . J FIELDWORKER . K FPG/PPAG CLINIC L MATERNITY HOME M OTHER PRIVATE MED. ________ N (SPEC FY) OTHER SOURCE SHOP/MARKET .. O TRADITIONAL PRACTITIONER P DRUG PEDDLER Q OTHER ________ X (SPEC FY)	PUBLIC SECTOR GOVT HOSPITAL/ POLYCLINIC . A GOVT HEALTH CENTER ..... B GOVT HEALTH POST/CHPS . C MOBILE CLINIC . D FIELDWORKER . E OTHER PUBLIC ________ F (SPECIFY) PRIVATE MEDICAL SECTOR PVT. HOSPITAL/ CLINIC .... G PHARMACY ... H PVT DOCTOR ... I MOBILE CLINIC . J FIELDWORKER . K FPG/PPAG CL NIC L MATERNITY HOME M OTHER PRIVATE MED. ________ N (SPECIFY) OTHER SOURCE SHOP/MARKET .. O TRADITIONAL PRACTITIONER P DRUG PEDDLER Q OTHER ________ X (SPEC FY)	PUBLIC SECTOR GOVT HOSPITAL/ POLYCLINIC . A GOVT HEALTH CENTER ..... B GOVT HEALTH POST/CHPS . C MOBILE CLINIC . D F ELDWORKER . E OTHER PUBLIC ________ F (SPEC FY) PRIVATE MEDICAL SECTOR PVT. HOSPITAL/ CLINIC .... G PHARMACY ... H PVT DOCTOR ... I MOBILE CLINIC . J F ELDWORKER . K FPG/PPAG CLINIC L MATERNITY HOME M OTHER PRIVATE MED. ________ N (SPECIFY) OTHER SOURCE SHOP/MARKET .. O TRADITIONAL PRACTITIONER P DRUG PEDDLER Q 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)

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NO.	QUESTIONS AND FILTERS	LAST BIRTH NAME _____	NEXT-TO-LAST B RTH NAME _____	SECOND-FROM-LAST B RTH NAME _____
525	Where did you first seek advice or treatment? USE LETTER CODE FROM 523.	FIRST PLACE . . . ☐	FIRST PLACE . . . ☐	FIRST PLACE . . . ☐
526	How many days after the diarrhea began did you first seek advice or treatment for (NAME)? IF THE SAME DAY, RECORD '00'.	DAYS . . . . . ☐☐	DAYS . . . . . ☐☐	DAYS . . . . . ☐☐
527	Does (NAME) still have diarrhea?	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 diarrhea: a) A fluid made from a special ORS sachet? b) A government-recommended homemade fluid?	YES NO DK FLUID FROM ORS SACH 1 2 8 HOMEMADE FLUID . . . 1 2 8	YES NO DK FLUID FROM ORS SACH 1 2 8 HOMEMADE FLUID . . . 1 2 8	YES NO DK FLUID FROM ORS SACH 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 (SK P 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 diarrhea? Anything else? RECORD ALL TREATMENTS GIVEN.	PILL OR SYRUP ANTIBIOTIC . . . . . A ANTIMOTILITY . B ZINC . . . . . C OTHER (NOT ANTI-BIOTIC, ANTI-MOTILITY, OR Z NC) . . . . . D UNKNOWN P LL OR SYRUP . . . E INJECTION ANTIBIOTIC . . . . . F NON-ANTIBIOTIC . G UNKNOWN INJECTION . . . H (IV) INTRAVENOUS . I HOME REMEDY/ HERBAL MED-IC NE . . . . . J OTHER _____ X (SPEC FY)	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)	P LL OR SYRUP ANTIBIOTIC . . . . . A ANTIMOTILITY . B Z NC . . . . . C OTHER (NOT ANTI-BIOTIC, ANTI-MOTILITY, OR ZINC) . . . . . D UNKNOWN PILL OR SYRUP . . . E INJECTION ANTIBIOTIC . . . . . F NON-ANT BIOTIC . G UNKNOWN INJECTION . . . H (IV) INTRAVENOUS . I HOME REMEDY/ HERBAL MED-ICINE . . . . . J OTHER _____ X (SPECIFY)
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 (SK P TO 537) ← DON'T KNOW 8	YES . . . . . 1 NO . . . . . 2 (SKIP TO 537) ← DON'T KNOW 8

NO.	QUESTIONS AND FILTERS	LAST BIRTH NAME ________	NEXT-TO-LAST B RTH NAME ________	SECOND-FROM-LAST B RTH NAME ________
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 (SK P 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 (SPEC FY) DON'T KNOW . . . . . 8 (SKIP TO 538)	CHEST ONLY . . . 1 NOSE ONLY . . . . . 2 BOTH . . . . 3 OTHER ________ 6 (SPECIFY) DON'T KNOW . . . . . 8 (SK P 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 DR NK 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 (SK P TO 545)

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NO.	QUESTIONS AND FILTERS	LAST BIRTH NAME _____	NEXT-TO-LAST B RTH NAME _____	SECOND-FROM-LAST B RTH 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/ POLYCL NIC . A GOVT HEALTH CENTER . . . . . B GOVT HEALTH POST/CHPS . C MOB LE CLINIC . D FIELDWORKER . E OTHER PUBLIC _____ F (SPECIFY) PRIVATE MEDICAL SECTOR PVT. HOSPITAL/ CLINIC . . . . . G PVT DOCTOR . . . H PHARMACY . . . I MOB LE CLINIC . J FIELDWORKER . K FPG/PPAG CLINIC L MATERNITY HOME M OTHER PRIVATE MED. _____ N (SPEC FY) OTHER SOURCE SHOP/MARKET . . O TRADITIONAL PRACTITIONER P DRUG PEDDLER Q OTHER _____ X (SPEC FY)	PUBLIC SECTOR GOVT HOSPITAL/ POLYCLINIC . A GOVT HEALTH CENTER . . . . . B GOVT HEALTH POST/CHPS . C MOBILE CLINIC . D FIELDWORKER . E OTHER PUBLIC _____ F (SPECIFY) PRIVATE MEDICAL SECTOR PVT. HOSPITAL/ CLINIC . . . . . G PVT DOCTOR . . . H PHARMACY . . . I MOBILE CLINIC . J FIELDWORKER . K FPG/PPAG CL NIC L MATERNITY HOME M OTHER PRIVATE MED. _____ N (SPECIFY) OTHER SOURCE SHOP/MARKET . . O TRADITIONAL PRACTITIONER P DRUG PEDDLER Q OTHER _____ X (SPEC FY)	PUBLIC SECTOR GOVT HOSPITAL/ POLYCLINIC . A GOVT HEALTH CENTER . . . . . B GOVT HEALTH POST/CHPS . C MOBILE CLINIC . D F ELDWORKER . E OTHER PUBLIC _____ F (SPEC FY) PRIVATE MEDICAL SECTOR PVT. HOSPITAL/ CLINIC . . . . . G PVT DOCTOR . . . H PHARMACY . . . I MOBILE CLINIC . J F ELDWORKER . K FPG/PPAG CLINIC L MATERNITY HOME M OTHER PRIVATE MED. _____ N (SPECIFY) OTHER SOURCE SHOP/MARKET . . O TRADITIONAL PRACTITIONER P DRUG PEDDLER Q 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 N 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 N NEXT-TO-LAST COLUMN OF NEW QUESTIONNA RE; OR, IF NO MORE B RTHS, GO TO 573) DON'T KNOW 8

NO.	QUESTIONS AND FILTERS	LAST BIRTH NAME _____	NEXT-TO-LAST B RTH NAME _____	SECOND-FROM-LAST B RTH NAME _____
547	What drugs did (NAME) take? Any other drugs? RECORD ALL MENTIONED.	ANT MALARIAL DRUGS SP/FANSIDAR/ MALAFAN . . . A CHLOROQUINE . B CAMOQUINE . . . C QUININE . . . . . D ARTESUNATE WITH AMODIAQUINE E ARTEMISIN N . . . F ARTEMETHER/ LUMEFANTRINE G OTHER ANTI-MALARIAL _____ (SPECIFY) . . . H ANT BIOTIC DRUGS P LL/SYRUP . . . I INJECTION . . . J OTHER DRUGS ASPIRIN . . . . . K PARACETAMOL/ PANADOL . . . L IBUPROFEN . . . M HERBAL MEDICINE . N OTHER _____ (SPEC FY) X DON'T KNOW . . . . . Z	ANTIMALARIAL DRUGS SP/FANS DAR/ MALAFAN . . . A CHLOROQUINE . B CAMOQUINE . . . C QUININE . . . . . D ARTESUNATE WITH AMODIAQUINE E ARTEMIS NIN . . . F ARTEMETHER/ LUMEFANTRINE G OTHER ANTI-MALARIAL _____ (SPECIFY) . . . H ANTIBIOTIC DRUGS PILL/SYRUP . . . I NJECTION . . . J OTHER DRUGS ASPIR N . . . . . K PARACETAMOL/ PANADOL . . . L BUPROFEN . . . M HERBAL MEDIC NE . N OTHER _____ (SPECIFY) X DON'T KNOW . . . . . Z	ANTIMALARIAL DRUGS SP/FANSIDAR/ MALAFAN . . . A CHLOROQUINE . B CAMOQUINE . . . C QUIN NE . . . . . D ARTESUNATE WITH AMODIAQUINE E ARTEMISININ . . . F ARTEMETHER/ LUMEFANTR NE G OTHER ANTI-MALARIAL _____ (SPECIFY) . . . H ANTIBIOTIC DRUGS PILL/SYRUP . . . I INJECTION . . . J OTHER DRUGS ASPIRIN . . . . . K PARACETAMOL/ PANADOL . . . L IBUPROFEN . . . M HERBAL MEDIC NE . N OTHER _____ (SPECIFY) X DON'T KNOW . . . . . Z
548	CHECK 547: ANY CODE A-I C RCLED?	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 B RTHS, 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 'H' THAT THE CHILD IS RECORDED AS HAV NG TAKEN N 547. IF YES FOR ANY DRUG, CIRCLE CODE FOR THAT DRUG. IF NO FOR ALL DRUGS, CIRCLE 'Y'.	ANT MALARIAL DRUGS SP/FANSIDAR/ MALAFAN . . . A CHLOROQUINE . B CAMOQUINE . . . C QUININE . . . . . D ARTESUNATE WITH AMODIAQUINE E ARTEMISIN N . . . F ARTEMETHER/ LUMEFANTRINE G OTHER ANTI-MALARIAL _____ (SPECIFY) . . . H ANT BIOTIC PILL/ SYRUP . . . . . I NO DRUG AT HOME . Y	ANTIMALARIAL DRUGS SP/FANS DAR/ MALAFAN . . . A CHLOROQUINE . B CAMOQUINE . . . C QUININE . . . . . D ARTESUNATE WITH AMODIAQUINE E ARTEMIS NIN . . . F ARTEMETHER/ LUMEFANTRINE G OTHER ANTI-MALARIAL _____ (SPECIFY) . . . H ANTIBIOTIC P LL/ SYRUP . . . . . I NO DRUG AT HOME . Y	ANTIMALARIAL DRUGS SP/FANSIDAR/ MALAFAN . . . A CHLOROQUINE . B CAMOQUINE . . . C QUIN NE . . . . . D ARTESUNATE WITH AMODIAQUINE E ARTEMISININ . . . F ARTEMETHER/ LUMEFANTR NE G OTHER ANTI-MALARIAL _____ (SPECIFY) . . . H ANTIBIOTIC PILL/ SYRUP . . . . . I NO DRUG AT HOME . Y

NO.	QUESTIONS AND FILTERS	LAST BIRTH NAME ________	NEXT-TO-LAST B RTH NAME ________	SECOND-FROM-LAST B RTH NAME ________
550	CHECK 547: ANY CODE A-H 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/MALAFAN ('A') GIVEN	CODE 'A' C RCLED ↓ / CODE 'A' NOT CIRCLED (SKIP TO 554)	CODE 'A' CIRCLED ↓ / CODE 'A' NOT CIRCLED (SK P 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/Malafan?	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/Malafan? IF 7 DAYS OR MORE, RECORD '7'	DAYS . . . . [ ] DON'T KNOW . . . 8	DAYS . . . . [ ] DON'T KNOW . . . 8	DAYS . . . . [ ] DON'T KNOW . . . 8
554	CHECK 547: CHLOROQUINE ('B') GIVEN	CODE 'B' C RCLED ↓ / CODE 'B' NOT CIRCLED (SKIP TO 557)	CODE 'B' CIRCLED ↓ / CODE 'B' NOT CIRCLED (SK P 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, RECORD '7'	DAYS . . . . [ ] DON'T KNOW . . . 8	DAYS . . . . [ ] DON'T KNOW . . . 8	DAYS . . . . [ ] DON'T KNOW . . . 8
557	CHECK 547: CAMOQUINE ('C') GIVEN	CODE 'C' C RCLED ↓ / CODE 'C' NOT CIRCLED (SKIP TO 560)	CODE 'C' CIRCLED ↓ / CODE 'C' NOT CIRCLED (SK P TO 560)	CODE 'C' CIRCLED ↓ / CODE 'C' NOT CIRCLED (SKIP TO 560)

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NO.	QUESTIONS AND FILTERS	LAST BIRTH NAME ________	NEXT-TO-LAST B RTH NAME ________	SECOND-FROM-LAST B RTH NAME ________
558	How long after the fever started did (NAME) first take Camoquine?	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 Camoquine? IF 7 DAYS OR MORE, RECORD '7'	DAYS . . . . [ ] DON'T KNOW . . . 8	DAYS . . . . [ ] DON'T KNOW . . . 8	DAYS . . . . [ ] DON'T KNOW . . . 8
560	CHECK 547: QUIN NE ('D') GIVEN	CODE 'D' C RCLED [ ] / CODE 'D' NOT CIRCLED [ ] (SKIP TO 563)	CODE 'D' CIRCLED [ ] / CODE 'D' NOT CIRCLED [ ] (SK P 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, RECORD '7'	DAYS . . . . [ ] DON'T KNOW . . . 8	DAYS . . . . [ ] DON'T KNOW . . . 8	DAYS . . . . [ ] DON'T KNOW . . . 8
563	CHECK 547: ARTESUNATE WITH AMODIAQUINE ('E') GIVEN	CODE 'E' C RCLED [ ] / CODE 'E' NOT CIRCLED [ ] (SKIP TO 566)	CODE 'E' CIRCLED [ ] / CODE 'E' NOT CIRCLED [ ] (SK P TO 566)	CODE 'E' CIRCLED [ ] / CODE 'E' NOT CIRCLED [ ] (SKIP TO 566)
564	How long after the fever started did (NAME) first take Artesunate with Amodiaquine combination?	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 the Artesunate with Amodiaquine combination? IF 7 DAYS OR MORE, RECORD '7'	DAYS . . . . [ ] DON'T KNOW . . . 8	DAYS . . . . [ ] DON'T KNOW . . . 8	DAYS . . . . [ ] DON'T KNOW . . . 8

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NO.	QUESTIONS AND FILTERS	LAST BIRTH NAME ______	NEXT-TO-LAST B RTH NAME ______	SECOND-FROM-LAST B RTH NAME ______
566	CHECK 547: ARTEMISININ ('F') GIVEN	CODE 'F' C RCLED ☐ / CODE 'F' NOT CIRCLED ☐ (SKIP TO 569)	CODE 'F' CIRCLED ☐ / CODE 'F' NOT CIRCLED ☐ (SK P TO 569)	CODE 'F' CIRCLED ☐ / CODE 'F' NOT CIRCLED ☐ (SKIP TO 569)
567	How long after the fever started did (NAME) first take Artemisinin?	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
568	For how many days did (NAME) take the Artemisinin? IF 7 DAYS OR MORE, RECORD '7'	DAYS . . . . ☐ DON'T KNOW . . . 8	DAYS . . . . ☐ DON'T KNOW . . . 8	DAYS . . . . ☐ DON'T KNOW . . . 8
569	CHECK 547: ARTEMETHER/LUMEFANTRINE ('G') GIVEN	CODE 'G' C RCLED ☐ / CODE 'G' NOT CIRCLED ☐ (SKIP TO 571A)	CODE 'G' CIRCLED ☐ / CODE 'G' NOT CIRCLED ☐ (SKIP TO 571A)	CODE 'G' CIRCLED ☐ / CODE 'G' NOT CIRCLED ☐ (SKIP TO 571A)
570	How long after the fever started did (NAME) first take Artemether/Lumefantrine?	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 Artemether/Lumefantrine? IF 7 DAYS OR MORE, RECORD '7'	DAYS . . . . ☐ DON'T KNOW . . . 8	DAYS . . . . ☐ DON'T KNOW . . . 8	DAYS . . . . ☐ DON'T KNOW . . . 8
571A	CHECK 547: OTHER ANTIMALARIAL ('H') GIVEN	CODE 'H' C RCLED ☐ / CODE 'H' NOT CIRCLED ☐ (GO BACK TO 503 IN NEXT COLUMN; OR, IF NO MORE BIRTHS, GO TO 573)	CODE 'H' CIRCLED ☐ / CODE 'H' NOT CIRCLED ☐ (GO BACK TO 503 IN NEXT COLUMN; OR, IF NO MORE BIRTHS, GO TO 573)	CODE 'H' CIRCLED ☐ / CODE 'H' NOT CIRCLED ☐ (GO TO 503 IN NEXT-TO-LAST COLUMN OF NEW QUESTIONNAIRE; OR, IF NO MORE BIRTHS, GO TO 573)
571B	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
571C	For how many days did (NAME) take the (OTHER ANTIMALARIAL)? IF 7 DAYS OR MORE, RECORD '7'	DAYS . . . . ☐ DON'T KNOW . . . 8	DAYS . . . . ☐ DON'T KNOW . . . 8	DAYS . . . . ☐ DON'T KNOW . . . 8
572		GO BACK TO 503 IN NEXT COLUMN; OR, IF NO MORE BIRTHS, GO TO 573.	GO BACK TO 503 IN NEXT COLUMN; OR, F 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 LIVING WITH THE RESPONDENT ONE OR MORE ☐ → RECORD NAME OF YOUNGEST CHILD LIVING WITH HER (AND CONTINUE WITH 574) _____ (NAME) NONE ☐ → 576		
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), ALL COLUMNS: NO CHILD RECEIVED FLUID FROM ORS PACKET ☐ ANY CHILD RECEIVED FLUID FROM ORS PACKET ☐ → 577		
576	Have you ever heard of a special product called ORS packet or a pre-packaged ORS liquid you can get for the treatment of diarrhea?	YES . . . . . 1 NO 2	
577	CHECK 215 AND 218, ALL ROWS: NUMBER OF CHILDREN BORN IN 2005 OR LATER LIVING WITH THE RESPONDENT ONE OR MORE ☐ → RECORD NAME OF YOUNGEST CHILD LIVING WITH HER (AND CONTINUE WITH 578) _____ (NAME) NONE ☐ → 601		
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): Plain water? Commercially produced infant formula? Any commercially produced baby cereal such as Nestle Cerelac, Fresocrem? Any (other) porridge or gruel? ASK TO SEE THE BOX TO ENSURE THAT IT IS COMMERCIALLY PRODUCED AND FORTIFIED	YES NO DK PLAIN WATER . . . . . 1 2 8 FORMULA . . . . . 1 2 8 BABY CEREAL . . . . . 1 2 8 OTHER PORRIDGE/GRUEL . . 1 2 8	

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP

579 Now I would like to ask you about (other) liquids or foods that (NAME FROM 577)/you may have had yesterday during the day or at night. I am interested in whether your child/you had the item even if it was combined with other foods.

Did (NAME FROM 577)/you drink (eat):		CHILD YES NO DK	MOTHER YES NO DK
a) Milk such as tinned, powdered, or fresh animal milk?	**a**	1 2 8	1 2 8
b) Tea or coffee?	**b**	1 2 8	1 2 8
c) Any other liquids (juice, cocoa)?	**c**	1 2 8	1 2 8
d) Bread, rice, noodles, or other foods made from grains (kenkey,banku, koko,tuo zaafi,akple,weanimix)?	**d**	1 2 8	1 2 8
e) Pumpkin, red or yellow yams, carrots, sweet potatoes that are yellow or orange inside?	**e**	1 2 8	1 2 8
f) White potatoes, white yams, manioc, cassava, cocoyam, fufu or any other foods made from roots, tubers or plantain?	**f**	1 2 8	1 2 8
g) Any dark green, leafy vegetables (kontomire, aleefu, ayoyo, kale,cassava leaves)?	**g**	1 2 8	1 2 8
h) Ripe mangoes, paw paw?	**h**	1 2 8	1 2 8
i) Any other fruits or vegetables [e.g. bananas, avocados, tomatoes, oranges, apples]?	**i**	1 2 8	1 2 8
j) Liver, kidney, heart or other organ meats?	**j**	1 2 8	1 2 8
k) Any meat, such as beef, pork, lamb, goat, chicken, or duck?	**k**	1 2 8	1 2 8
l) Eggs?	**l**	1 2 8	1 2 8
m) Fresh or dried fish or shellfish [e.g. prawn, lobster] ?	**m**	1 2 8	1 2 8
n) Any foods made from beans, peas, lentils, or nuts?	**n**	1 2 8	1 2 8
o) Cheese, yogurt or other milk products?	**o**	1 2 8	1 2 8
p) Any oil, fats, or butter, or foods made with any of these?	**p**	1 2 8	1 2 8
q) Any sugary foods such as chocolates, sweets, candies, pastries, cakes, or biscuits?	**q**	1 2 8	1 2 8
r) Any other solid or semi-solid food?	**r**	1 2 8	1 2 8

580 CHECK 578 (LAST 2 CATEGORIES: BABY CEREAL OR OTHER PORRIDGE/GRUEL) AND 579 (CATEGORIES d THROUGH r FOR CHILD):

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 toge her 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 o her 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 he 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 wi h your first husband/partner. In what month and year was that?	MONTH . . . . . DON'T KNOW MONTH . . . . . 98 YEAR . . . . . DON'T KNOW YEAR 9998	→ 617
616	How old were you when you first started living with him?	AGE	

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
617	CHECK FOR THE PRESENCE OF OTHERS. BEFORE CONTINUING, MAKE EVERY EFFORT TO ENSURE PRIVACY.		
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 he 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 ime?	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 male condom used?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW/DON'T REMEMBER . . . 8	
623	How old was he 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 his 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 ime 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 male condom used?	YES . . . . . 1 NO . . . . . 2 (SKIP TO 630)	YES . . . . . 1 NO . . . . . 2 (SKIP TO 630)	YES . . . . . 1 NO . . . . . 2 (SK P TO 630)
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 (SK P TO 636) LIVE- N PARTNER . . . . 2 BOYFR END NOT LIVING WITH RESPONDENT . . . . 3 CASUAL ACQUA NTANCE . . . 4 PROSTITUTE . . . . . 5 OTHER _____ 6 (SPECIFY)	HUSBAND . . . . . 1 (SK P TO 636) LIVE- N PARTNER . . . . 2 BOYFRIEND NOT LIV NG WITH RESPONDENT . . . . 3 CASUAL ACQUAINTANCE . . . 4 PROSTITUTE . . . . . 5 OTHER _____ 6 (SPECIFY)	HUSBAND . . . . . 1 (SKIP TO 636) LIVE-IN PARTNER . . . . 2 BOYFRIEND NOT LIV NG WITH RESPONDENT . . . . 3 CASUAL ACQUAINTANCE . . . 4 PROSTITUTE . . . . . 5 OTHER _____ 6 (SPEC FY)
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 (SK P TO 636)
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

		LAST SEXUAL PARTNER	SECOND-TO-LAST SEXUAL PARTNER	THIRD-TO-LAST SEXUAL PARTNER
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 (SK P TO 639) ←
637	Were you or your partner drunk at that time? IF YES: Who was drunk?	RESPONDENT ONLY 1 PARTNER ONLY . . . 2 RESPONDENT AND PARTNER BOTH . 3 NEITHER 4	RESPONDENT ONLY 1 PARTNER ONLY . . . 2 RESPONDENT AND PARTNER BOTH . 3 NEITHER 4	RESPONDENT ONLY 1 PARTNER ONLY . . . 2 RESPONDENT AND PARTNER BOTH . 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 639A) ←	YES . . . . . 1 (GO BACK TO 627 IN NEXT COLUMN) ← NO . . . . . 2 (SKIP TO 639A) ←	
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 EST MATE. IF NUMBER OF PARTNERS IS GREATER THAN 95, WRITE '95.'			NUMBER OF PARTNERS LAST 12 MONTHS . . . ☐☐ DON'T KNOW . . . 98

639A	In total, with how many different people have you had sexual intercourse in the last month? IF NON-NUMERIC ANSWER, PROBE TO GET AN ESTIMATE. IF NUMBER OF PARTNERS IS GREATER THAN 95, WRITE '95.'	NUMBER OF PARTNERS IN MONTH . . . . . ☐☐ DON'T KNOW 98	
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 L FET ME . . . . . ☐☐ DON'T KNOW 98	
641	Do you know of a place where a person can get male condoms?	YES . . . . . 1 NO 2	→ 701
642	Where is that? Any other place? PROBE TO IDENT FY EACH TYPE OF SOURCE AND CIRCLE THE APPROPRIATE CODE(S). IF UNABLE TO DETERMINE F HOSPITAL, HEALTH CENTER OR CLINIC IS PUBLIC OR PRIVATE MEDICAL, WRITE THE NAME OF THE PLACE. _____ (NAME OF PLACE(S))	PUBLIC SECTOR GOVT. HOSPITAL/POLYCLINIC . . . A GOVT. HEALTH CENTER . . . . . B GOVT. HEALTH POST/CHPS . . . C FAMILY PLANN NG CLINIC . . . . . D MOBILE CL NIC . . . . . E FIELDWORKER/OUTREACH/ PEER EDUCATOR . . . . . F OTHER PUBLIC _____ (SPECIFY) G PRIVATE MEDICAL SECTOR PRIVATE HOSPITAL/CLINIC . . . . . H PRIVATE DOCTOR . . . . . I PHARMACY . . . . . J CHEMICAL/DRUG STORE K FP/PPAG CLINIC . . . . . L MATERNITY HOME . . . . . M OTHER PRIVATE MEDICAL_____ (SPEC FY) N OTHER SOURCE SHOP/MARKET . . . . . O CHURCH . . . . . P COMMUNITY VOLUNTEER . . . . . Q FRIEND/RELATIVE . . . . . R OTHER _____ (SPECIFY) X	
643	If you wanted to, could you yourself get a condom?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW/UNSURE 8	

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 _____ (SPECIFY) 996 → 708 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 _____ X (SPECIFY) DON'T KNOW . . . . . Z	
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 MALE CONDOM . . . . . 07 FEMALE CONDOM . . . . . 08 DIAPHRAGM . . . . . 09 FOAM/JELLY . . . . . 10 LACTATIONAL AMEN. METHOD . . . . . 11 RHYTHM METHOD . . . . . 12 WITHDRAWAL . . . . . 13 OTHER _____ 96 (SPECIFY) 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)	
721	CHECK 311/311A: NEITHER STERILIZED ↓ HE OR SHE STERILIZED → 722A		
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	
722A	I will now read you some statements about contraception. Please tell me if you agree or disagree with each one. a) Contraception is women's business and a man should not have to worry about it. b) Women who use contraception may become promiscuous. c) Having too many children may be dangerous for a woman d) It is better not to have more children than we can afford e) Children in smaller families are more likely to succeed	AGREE / DISAGREE / DK CONTRACEPTION WOMAN'S BUSINESS . 1 2 8 WOMAN MAY BECOME PROMISCUOUS . . . . . 1 2 8 DANGEROUS F/WOMAN 1 2 8 CHILDREN NOT AFFORD 1 2 8 CHILDREN SUCCEED 1 2 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 was the highest level of school he attended: primary, middle/JSS, secondary/SSS, or higher?	PRIMARY . . . . . 1 MIDDLE/JSS . . . . . 2 SECONDARY/SSS . . . . . 3 HIGHER . . . . . 4 DON'T KNOW 8	→ 806
805	What was the highest grade he completed at that level?	GRADE . . . . . ☐☐ DON'T KNOW 98	
806	CHECK 801: CURRENTLY MARRIED/ LIVING WITH A MAN ↓ What is your husband's/partner's occupa ion? 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		
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	

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
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	
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 makes decisions about how many children to have?	1 2 3 4 6	

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
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 F LTERS	COD NG 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	→ 942
902	Can people reduce their chance of getting the A DS 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 A DS 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 A DS?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	
906	Can people reduce their chance of getting the A DS 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	
908	Is it possible for a healthy-looking person to have the AIDS virus?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	
909	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 BREASTFEED NG . . . 1 2 8	
910	CHECK 909: AT LEAST ONE 'YES' ↓ OTHER →		912
911	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	
912	Have you heard about special antiretroviral drugs (Nevirapine) that people infected with the AIDS virus can get from a doctor or a nurse to help them live longer?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	
913	CHECK 208 AND 215: NO BIRTHS →		922
	LAST BIRTH SINCE JANUARY 2005 ↓ LAST BIRTH BEFORE JANUARY 2005 →		922
914	CHECK 407 FOR LAST BIRTH: HAD ANTENATAL CARE ↓ NO ANTENATAL CARE →		922
914A	CHECK FOR PRESENCE OF OTHERS. BEFORE CONTINU NG, MAKE EVERY EFFORT TO ENSURE PRIVACY.		
915	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	
916	Were you offered a test for the A DS virus as part of your antenatal care?	YES . . . . . 1 NO 2	

NO.	QUESTIONS AND F LTERS	COD NG CATEGORIES	SKIP
917	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	→ 922
918	I don't want to know the results, but did you get the results of the test?	YES . . . . . 1 NO 2	
919	Where was the test done? PROBE TO IDENTIFY THE TYPE OF SOURCE AND CIRCLE THE APPROPRIATE CODE. IF UNABLE TO DETERMINE F HOSPITAL, HEALTH CENTER, VCT CENTER, OR CL NIC IS PUBLIC OR PRIVATE MEDICAL, WRITE THE NAME OF THE PLACE. _____ (NAME OF PLACE)	PUBLIC SECTOR GOVT. HOSPITAL/POLYCLINIC . . . 11 GOVT. HEALTH CENTER . . . . . 12 GOVT. HEALTH POST/CHPS . . . . . 13 STAND-ALONE VCT CENTER . . . 14 FAMILY PLANNING CLINIC . . . . . 15 MOBILE CLINIC . . . . . 16 F ELDWORKER/OUTREACH/ PEER EDUCATOR . . . . . 17 OTHER PUBLIC _____ 18 (SPEC FY) PRIVATE MEDICAL SECTOR PRIVATE HOSPITAL/CLINIC/ PRIVATE DOCTOR . . . . . 21 STAND-ALONE VCT CENTER . . . 22 PHARMACY . . . . . 23 CHEMICAL/DRUG STORE 24 FP/PPAG CL NIC . . . . . 25 MATERNITY HOME . . . . . 26 OTHER PRIVATE MEDICAL _____ 27 (SPEC FY) OTHER _____ 96 (SPEC FY)	
920	Have you been tested for the A DS virus since that time you were tested during your pregnancy?	YES . . . . . 1 NO 2	→ 923
921	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	→ 929
922	I don't want to know the results, but have you ever been tested to see if you have the AIDS virus?	YES . . . . . 1 NO 2	→ 927
923	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	
924	The last time you had the test, did you yourself ask for the test, was it offered to you and you accepted, or was it required?	ASKED FOR THE TEST . . . . . 1 OFFERED AND ACCEPTED . . . . . 2 REQU RED 3	
925	I don't want to know the results, but did you get the results of the test?	YES . . . . . 1 NO 2	
926	Where was the test done? PROBE TO IDENTIFY THE TYPE OF SOURCE AND CIRCLE THE APPROPRIATE CODE. IF UNABLE TO DETERMINE F HOSPITAL, HEALTH CENTER, VCT CENTER, OR CL NIC IS PUBLIC OR PRIVATE MEDICAL, WRITE THE NAME OF THE PLACE. _____ (NAME OF PLACE)	PUBLIC SECTOR GOVT. HOSPITAL/POLYCLINIC . . . 11 GOVT. HEALTH CENTER . . . . . 12 GOVT. HEALTH POST/CHPS . . . . . 13 STAND-ALONE VCT CENTER . . . 14 FAMILY PLANNING CLINIC . . . . . 15 MOBILE CLINIC . . . . . 16 F ELDWORKER/OUTREACH/ PEER EDUCATOR . . . . . 17 OTHER PUBLIC _____ 18 (SPEC FY) PRIVATE MEDICAL SECTOR PRIVATE HOSPITAL/CLINIC/ PRIVATE DOCTOR . . . . . 21 STAND-ALONE VCT CENTER . . . 22 PHARMACY . . . . . 23 CHEMICAL/DRUG STORE 24 FP/PPAG CL NIC . . . . . 25 MATERNITY HOME . . . . . 26 OTHER PRIVATE MEDICAL _____ 27 (SPEC FY) OTHER _____ 96 (SPEC FY)	→ 929

NO.	QUESTIONS AND F LTERS	COD NG CATEGORIES	SKIP
927	Do you know of a place where people can go to get tested for the AIDS virus?	YES . . . . . 1 NO 2	→ 929
928	Where is that? Any other place? PROBE TO IDENTIFY EACH TYPE OF SOURCE AND CIRCLE THE APPROPRIATE CODE(S). IF UNABLE TO DETERMINE F HOSPITAL, HEALTH CENTER VCT CENTER, OR CL NIC IS PUBLIC OR PRIVATE MEDICAL, WRITE THE NAME OF THE PLACE. _____ (NAME OF PLACE(S))	PUBLIC SECTOR GOVT. HOSPITAL/POLYCLINIC . . . A GOVT. HEALTH CENTER . . . . . B GOVT. HEALTH POST/CHPS . . . . . C STAND-ALONE VCT CENTER . . . D FAMILY PLANNING CLINIC . . . . . E MOBILE CLINIC . . . . . F F ELDWORKER/OUTREACH/ PEER EDUCATOR . . . . . G OTHER PUBLIC _____ (SPEC FY) PRIVATE MEDICAL SECTOR PRIVATE HOSPITAL/CLINIC/ H PRIVATE DOCTOR . . . . . I STAND-ALONE VCT CENTER . . . J PHARMACY . . . . . K CHEMICAL/DRUG STORE L FP/PPAG CL NIC . . . . . M MATERNITY HOME . . . . . N OTHER PRIVATE MEDICAL _____ (SPEC FY) O OTHER SOURCE SHOP/MARKET . . . . . P CHURCH . . . . . Q FRIEND/RELATIVE . . . . . R OTHER _____ (SPEC FY) X	
929	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	
930	If a member of your family got infected with the A DS virus, would you want it to remain a secret or not?	YES, REMAIN A SECRET . . . . . 1 NO . . . . . 2 DK/NOT SURE/DEPENDS 8	
931	If a member of your family became sick with A DS, would you be willing to care for her or him in your own household?	YES . . . . . 1 NO . . . . . 2 DK/NOT SURE/DEPENDS 8	
932	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	
940	Should children age 12-14 be taught about using a condom to avoid getting AIDS?	YES . . . . . 1 NO . . . . . 2 DK/NOT SURE/DEPENDS 8	
941	Should children age 12-14 be taught to wait until they get married to have sexual intercourse in order to avoid getting AIDS?	YES . . . . . 1 NO . . . . . 2 DK/NOT SURE/DEPENDS 8	
942	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	
943	CHECK 618: HAS HAD SEXUAL INTERCOURSE ↓ HAS NOT HAD SEXUAL INTERCOURSE →		→ 951
944	CHECK 942: HEARD ABOUT OTHER SEXUALLY TRANSMITTED NFECTIONS? YES ↓ NO →		→ 946

NO.	QUESTIONS AND F LTERS	COD NG CATEGORIES	SKIP
945	Now I would like to ask you some questions about your health in the last 12 months. During the last 12 months, have you had a disease which you got through sexual contact?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	
946	Sometimes women experience a bad smelling abnormal genital discharge. During the last 12 months, have you had a bad smelling abnormal genital discharge?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	
947	Sometimes women have a genital sore or ulcer. During the last 12 months, have you had a genital sore or ulcer?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	
948	CHECK 945, 946, AND 947: HAS HAD AN INFECTION (ANY 'YES') ↓ HAS NOT HAD AN INFECTION OR DOES NOT KNOW →		951
949	The last time you had (PROBLEM FROM 945/946/947), did you seek any kind of advice or treatment?	YES . . . . . 1 NO 2	951
950	Where did you go? Any other place? PROBE TO IDENTIFY EACH TYPE OF SOURCE AND CIRCLE THE APPROPRIATE CODE(S). IF UNABLE TO DETERMINE F HOSPITAL, HEALTH CENTER VCT CENTER, OR CL NIC IS PUBLIC OR PRIVATE MEDICAL, WRITE THE NAME OF THE PLACE. _____ (NAME OF PLACE(S))	PUBLIC SECTOR GOVT. HOSPITAL/POLYCLINIC . . . A GOVT. HEALTH CENTER . . . . . B GOVT. HEALTH POST/CHPS . . . . . C FAMILY PLANNING CLINIC. . . . . D STAND-ALONE VCT CENTER . . . E F ELDWORKER/OUTREACH/ PEER EDUCATOR . . . . . F OTHER PUBLIC _____ (SPEC FY) G PRIVATE MEDICAL SECTOR PRIVATE HOSPITAL/CLINIC/ PRIVATE DOCTOR . . . . . H STAND-ALONE VCT CENTER . . . I PHARMACY . . . . . J CHEMICAL/DRUG STORE K FP/PPAG CL NIC . . . . . L MATERNITY HOME. . . . . M OTHER PRIVATE MEDICAL_____ (SPEC FY) N OTHER SOURCE SHOP/MARKET . . . . . O FRIEND/RELATIVE . . . . . P TRADITIONAL PRACTICIONER Q OTHER _____ (SPECIFY) X	
951	Husbands and wives do not always agree on everything. If a wife knows her husband has a disease that she can get during sexual intercourse, is she justified in refusing to have sex with him?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	
952	If a wife knows her husband has a disease that she can get during sexual intercourse, is she justified in asking that they use a condom when they have sex?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	
953	Is a wife justified in refusing to have sex with her husband when she is tired or not in the mood?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	
954	Is a wife justified in refusing to have sex with her husband when she knows her husband has sex with other women?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	
955	CHECK 601: CURRENTLY MARR ED/ LIVING WITH A MAN ↓ NOT N UNION →		1001
956	Can you say no to your husband/partner if you do not want to have sexual intercourse?	YES . . . . . 1 NO . . . . . 2 DEPENDS/NOT SURE. 8	
957	Could you ask your husband/partner to use a condom if you wanted him to?	YES . . . . . 1 NO . . . . . 2 DEPENDS/NOT SURE. 8	

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	→ 1005
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 _____ (SPECIFY) X 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	
1005	Now I would like to ask you some other questions relating to health matters. Have you had an injection for any reason in the last 12 months? IF YES: How many injections have you had? IF NUMBER OF INJECTIONS IS GREATER THAN 90, OR DAILY FOR 3 MONTHS OR MORE, RECORD '90'. IF NON-NUMERIC ANSWER, PROBE TO GET AN ESTIMATE.	NUMBER OF INJECTIONS . . . ☐☐ NONE 00	→ 1009
1006	Among these injections, how many were administered by a doctor, a nurse, a pharmacist, a dentist, or any other health worker? IF NUMBER OF INJECTIONS IS GREATER THAN 90, OR DAILY FOR 3 MONTHS OR MORE, RECORD '90'. IF NON-NUMERIC ANSWER, PROBE TO GET AN ESTIMATE.	NUMBER OF INJECTIONS . . . ☐☐ NONE 00	→ 1009
1007	The last time you had an injection given to you by a health worker, where did you go to get the injection? 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 GOVT. HOSPITAL/POLYCLINIC . . . . . 11 GOVT. HEALTH CENTER . . . . . 12 GOVT. HEALTH POST/CHPS . . . . . 13 STAND-ALONE VCT CENTER . . . . . 14 FAMILY PLANNING CLINIC . . . . . 15 MOBILE CLINIC . . . . . 16 FIELDWORKER/OUTREACH/ PEER EDUCATOR . . . . . 17 OTHER PUBLIC _____ (SPECIFY) 18 PRIVATE MEDICAL SECTOR PRIVATE HOSPITAL/CLINIC/ PRIVATE DOCTOR . . . . . 21 STAND-ALONE VCT CENTER . . . . . 22 PHARMACY . . . . . 23 CHEMICAL/DRUG STORE . . . . . 24 FP/PPAG CLINIC . . . . . 25 MATERNITY HOME . . . . . 26 OTHER PRIVATE MEDICAL _____ (SPECIFY) 27 OTHER PLACE AT HOME . . . . . 31 OTHER _____ (SPECIFY) 96	
1008	Did the person who gave you that injection take the syringe and needle from a new, unopened package?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	
1009	Do you currently smoke cigarettes?	YES . . . . . 1 NO 2	→ 1011
1010	In the last 24 hours, how many sticks of cigarettes did you smoke?	CIGARETTES . . . . . ☐☐	
1011	Do you currently smoke or use any other type of tobacco?	YES . . . . . 1 NO 2	→ 1012A

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
1012	What (other) type of tobacco do you currently smoke or use? RECORD ALL MENTIONED.	PIPE . . . . . A CHEWING TOBACCO . . . . . B SNUFF . . . . . C CIGARS . . . . . D OTHER _____ X (SPECIFY)	
1012A	Do you consume alcoholic beverages?	YES . . . . . 1 NO 2	→ 1013
1012B	In the last 7 days (a week) did you drink an alcoholic beverage? IF 'YES', PROBE: How many times?	ONCE . . . . . 01 2-3 TIMES . . . . . 02 4 TIMES OR MORE . . . . . 03 NONE 04	
1013	Many different factors can prevent women from getting medical advice or treatment for themselves. When you are sick and want to get medical advice or treatment, is each of the following a big problem or not?	BIG PROBLEM / NOT A BIG PROBLEM	
	Getting permission to go?	PERMISSION TO GO . . . 1 2	
	Getting money needed for treatment?	GETTING MONEY 1 2	
	The distance to the health facility?	DISTANCE 1 2	
	Having to take transport?	TAKING TRANSPORT . . . 1 2	
	Not wanting to go alone?	GO ALONE 1 2	
	Concern that there may not be a female health provider?	NO FEMALE PROV. 1 2	
	Concern that there may not be any health provider?	NO PROVIDER 1 2	
	Concern that there may be no drugs available?	NO DRUGS 1 2	
1014	Do you have any health insurance or are you a member of a mutual health organization?	YES . . . . . 1 NO 2	→ 1016
1015	What type of health insurance do you have? RECORD ALL MENTIONED.	NATIONAL /DISTRICT HEALTH INSURANCE(NHIS) . . . . . A HEALTH INSURANCE THROUGH EMPLOYER . . . . . B MUTUAL HEALTH ORGANIZATION/ COMMUNITY-BASED HEALTH INSURANCE . . . . . C OTHER PRIVATELY PURCHASED COMMERCIAL HEALTH INSURANCE . D OTHER _____ X (SPECIFY)	
1015A	CHECK 1015: CODE 'A' FOR NHIS NOT CIRCLED ↓ ☐	CODE 'A' FOR NHIS CIRCLED ☐	→ 1015C
1015B	Why have you not registered with the National Health Insurance Scheme (NHIS)? RECORD ALL MENTIONED	NOT HEARD OF NHIS . . . . . A CANNOT AFFORD PREMIUM . . . . . B DO NOT TRUST . . . . . C DON'T NEED HEALTH INSURANCE . . . . . D NHIS DOES NOT COVER HEALTH SERVICES I NEED . . . . . E OTHER _____ X (SPECIFY)	→ 1015I
1015C	Did you pay your NHIS membership yourself?	YES, PAID MYSELF . . . . . 01 YES, PAID BY A RELATIVE/FRIEND . . . 02 YES, PAID BY EMPLOYER/SSNIT . . . . . 03 NO, EXEMPT AS ELDERLY (70+ YEARS) 04 NO, EXEMPT AS PENSIONER . . . . . 05 NO, EXEMPT AS INDIGENT (POOR) . . . 06 NO, OTHER _____ 96 (SPECIFY)	
1015D	Do you hold a valid National Health Insurance Scheme (NHIS) card? IF ANSWER IS 'YES', REQUEST TO SEE THE CARD	YES, CARD SEEN . . . . . 1 YES, CARD NOT SEEN/LOST . . . . . 2 NO 3	→ 1015F

NO.	QUESTIONS AND FILTERS	COD NG CATEGOR ES	SK P
1015E	Why do you not have a valid NHIS card?	REGISTERED, NOT PAID FULL\ . . . . . 1 REGISTERED, CARD NOT RECEIVED . . . . . 2 REGISTERED, WAITING PERIOI . . . . . 3 NOT RENEWED REGISTRATIO\ . . . . . 4 LOST NHIS CARD . . . . . 5 OTHER _____ 6 (SPECIFY)	→1015I →1015G →1015I
1015F	How many weeks did it take you to obtain your NHIS card?	NUMBER OF WEEKS ☐☐ DON'T KNOW 98	→1015I
1015G	Do you plan to renew the NHIS card?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW/NOT SURE 8	→1015I →1015I
1015H	Why do you not want to renew the NHIS card? Anything else? RECORD ALL MENTIONED.	HAVE NOT BEEN SICK . . . . . A PREMIUM EXPENSIVI . . . . . B ST LL PAY OUT OF POCKET . . . . . C WORSE QUALITY CARE WITH CARD . . . D WAIT NG TIME FOR CARD LONG . . . . . E USED SERVICES NOT COVERED . . . . . F D D NOT USE ANY HEALTH SERVICES G USE CLINICS OR TRADITIONAL PRACTITIONERS WHO ARE NOT COVERED . . . . . H OTHER _____ X (SPEC FY)	
1015I	Do you have to pay out of pocket for drugs and services?	YES . . . . . 1 NO . . . . . 2 SOMET MES 3	
1015J	Are there any services that you need from a health provider that are not covered by NHIS?	YES . . . . . 1 NO 2	→1015L
1015K	What are these services? Anything else? RECORD ALL MENTIONED.	FAMILY PLANN NG . . . . . A LABORATORY INVESTIGATIONS . . . . . B ANTENATAL CARE . . . . . C POSTNATAL CARE . . . . . D CARE FOR NEWBORN FOR UP TO 3 MONTHS . . . . . E OTHER _____ X (SPEC FY)	
1015L	In your opinion, do NHIS card holders get better/same/worse servlce than others?	BETTER . . . . . 1 SAME . . . . . 2 WORSE . . . . . 3 DON'T KNOW/NOT SURE 8	
1015M	In your opinion, did you receive good service last time you were treated at a clinic or hospital? F NO, PROBE	YES . . . . . 1 NO, WAITING T MES WERE TOO LONG 2 NO, STAFF NOT POLITE . . . . . 3 NO, DID NOT RECEIVE ENOUGH NFORMATION ABOUT ILLNESS AND TREATMENT . . . . . 4 OTHER _____ 6 (SPEC FY)	
1016	I am going to ask you about the time you spent being physically active in the last 7 days. This is about the activities you do at work, as part of your house and yard work, to get from place to place in your spare time, exercise or sport. Now, think about all the vigorous activities which take hard physcial effort that you did in the past 7 days: activties that make you breathe much harder than normal and may include heavy lifting, digging, jogging, or fast bicycling.Think about only those physical activities that you did at least 15 minutes at a time. In the last 7 days, on how many days did you do vigorous physical activities that lasted for at least 15mins each time? F 'NONE' RECORD '0'	NUMBER OF DAYS . . . . . ☐ DON'T KNOW 8	

NO.	QUESTIONS AND FILTERS	COD NG CATEGOR ES	SK P
1017	How many hours do you rest a day, including naps and sleep both during the day and night?	1-3 HOURS . . . . . 1 4-6 HOURS . . . . . 2 7-9 HOURS . . . . . 3 10 AND MORE HOURS . . . . . 4 DON'T KNOW 8	
1018	Now I would like to ask you about liquids and foods that you consume. How many glasses of water do you drink in one day on average? F MORE THAN 9, RECORD '9', F 'NONE' RECORD '0'	NUMBER OF GLASSES ☐	
1019	In a typical week, on how many days do you eat fruits, for example mangoes, paw paw, banana, orange, avocados, tomatoes, passion fruit, etc? F 'NONE' RECORD '0'	NUMBER OF DAYS . . . . . ☐ DON'T KNOW/NOT SURE 8	→ 1021
1020	On a day when you eat fruits, how many servings do you eat on average? F 'NONE' RECORD '0'	NUMBER OF SERV NGS . . . . . ☐ DON'T KNOW/NOT SURE 8	
1021	In a typical week, on how many days do you eat vegetables, for example carrots, cabbage, dark green leafy vegetables (e.g. kontomire), pumpkin, squash, etc? F 'NONE' RECORD '0'	NUMBER OF DAYS . . . . . ☐ DON'T KNOW/NOT SURE 8	→ 1100
1022	On a day when you eat vegetables, how many servings do you eat on average? F 'NONE' RECORD '0'	NUMBER OF SERV NGS . . . . . ☐ DON'T KNOW/NOT SURE 8	

SECTION 11 DOMESTIC VIOLENCE

NO.	QUESTIONS AND F LTERS	COD NG CATEGOR ES	SKIP
1100	CHECK HH Q.138 AND COVER PAGE OF WOMAN'S QUESTIONNA RE: WOMAN SELECTED FOR THIS SECTION ☐ ↓ WOMAN NOT SELECTED ☐ →		1135
1101	CHECK FOR PRESENCE OF OTHERS: DO NOT CONTINUE UNTIL EFFECTIVE PRIVACY IS ENSURED. PRIVACY OBTA NED . . . . . 1 ↓ PRIVACY NOT POSSIBLE . . . . . 2 →		1134
	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 Ghana. Let me assure you that your answers are completely confidential and will not be told to anyone, no one else will know that you were asked these questions, and no one else in this household is being asked these questions.		
1102	CHECK 601 AND 602: CURRENTLY MARR ED/ LIV NG WITH A MAN ☐ ↓ FORMERLY MARRIED/ LIVED WITH A MAN (READ N PAST TENSE) ☐ ↓ NEVER MARR ED/ NEVER LIVED WITH A MAN ☐ →		1114
1103	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 . . . . . YES 1 NO 2 DK 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 FAM LY 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	
	g) He (refuses/refused) or (denies/denied) to have sexual intercourse with you?	REFUSES SEX 1 2 8	
1103A	CHECK 204 AND 205: HAS CH LDREN LIV NG ELSEWHERE ☐ ↓ NO CH LDREN LIVING ELSEWHERE ☐ →		1104
1103B	Does/did he prevent you from seeing your children?	YES . . . . . 1 NO . . . . . 2 DK 8	
1103C	CHECK 215 AND 217: IF CHILD 3 YEARS OR OLDER OR BORN BEFORE JAN 2005 ☐ ↓ F CH LD LESS THAN 3 YEARS ☐ →		1104
1103D	Does/did he refuse to pay children's school fees?	YES . . . . . 1 NO . . . . . 2 DK 8	

NO.	QUESTIONS AND F LTERS	COD NG CATEGOR ES	SKIP
1104	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?		
			OFTEN	SOME-T MES	NOT AT ALL
a)	say or do something to humiliate you in front of others?	YES 1 → NO 2 ↓	1	2	3
b)	threaten to hurt or harm you or someone close to you?	YES 1 → NO 2 ↓	1	2	3
c)	insult you or make you feel bad about yourself?	YES 1 → NO 2 ↓	1	2	3

1105	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-T MES	NOT AT ALL
a)	push you, shake you, or throw something at you?	YES 1 → NO 2 ↓	1	2	3
b)	slap you?	YES 1 → NO 2 ↓	1	2	3
c)	twist your arm or pull your hair?	YES 1 → NO 2 ↓	1	2	3
d)	punch you with his fist or with something that could hurt you?	YES 1 → NO 2 ↓	1	2	3
e)	kick you, drag you or beat you up?	YES 1 → NO 2 ↓	1	2	3
f)	try to choke you or burn you on purpose?	YES 1 → NO 2 ↓	1	2	3
g)	threaten or attack you with a knife, gun, or any other weapon?	YES 1 → NO 2 ↓	1	2	3
h)	physically force you to have sexual intercourse with him even when you did not want to?	YES 1 → NO 2 ↓	1	2	3
i)	force you to perform any sexual acts you did not want to?	YES 1 → NO 2 ↓	1	2	3

1106	CHECK 1105A (a-i):	
	AT LEAST ONE 'YES' ↓	NOT A S NGLE 'YES' → 1109

1107	How long after you first got married to/started living with your (last) husband/partner did (this/any of these things) first happen? F LESS THAN ONE YEAR, RECORD '00'.	NUMBER OF YEARS . . . . . [ ][ ] BEFORE MARRIAGE/BEFORE LIV NG TOGETHER 95

1108	Did the following ever happen as a result of what your (last) husband/partner did to you:	
a)	You had cuts, bruises or aches?	YES . . . . . 1 NO 2
b)	You had eye injuries, sprains, dislocations, or burns?	YES . . . . . 1 NO 2
c)	You had deep wounds, broken bones, broken teeth, or any other serious injury?	YES . . . . . 1 NO 2

NO.	QUESTIONS AND F LTERS	COD NG CATEGOR ES	SKIP
1109	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	→ 1112
1111	In the last 12 months, how often have you done this to your (last) husband/partner: often, only sometimes, or not at all?	OFTEN . . . . . 1 SOMET MES . . . . . 2 NOT AT ALL 3	
1112	Does (did) your (last) husband/partner drink alcohol?	YES . . . . . 1 NO 2	→ 1114
1113	How often does (did) he get drunk: often, only sometimes, or never?	OFTEN . . . . . 1 SOMET MES . . . . . 2 NEVER 3	
1114	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	→ 1117
1115	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 BOYFR END . . . . . G FORMER BOYFRIEND . . . . . H MOTHER-IN-LAW . . . . . I FATHER-IN-LAW . . . . . J OTHER N-LAW . . . . . K TEACHER . . . . . L EMPLOYER/SOMEONE AT WORK . . . . . M POLICE/SOLDIER . . . . . N OTHER _____ (SPECIFY) X	
1116	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 SOMET MES . . . . . 2 NOT AT ALL 3	
1117	CHECK 201, 226, AND 229: EVER BEEN PREGNANT (YES ON 201 OR 226 OR 229) NEVER BEEN PREGNANT →		1120
1118	Has any one ever hit, slapped, kicked, or done anything else to hurt you physically while you were pregnant?	YES . . . . . 1 NO 2	→ 1120
1119	Who has done any of these things to physically hurt you while you were pregnant? Anyone else? RECORD ALL MENTIONED.	CURRENT HUSBAND/ LIVE- N PARTNER . . . . . A MOTHER/STEP-MOTHER . . . . . B FATHER/STEP-FATHER . . . . . C SISTER/BROTHER . . . . . D DAUGHTER/SON . . . . . E OTHER RELATIVE . . . . . F FORMER HUSBAND/ PARTNER . . . . . G CURRENT BOYFR END . . . . . H FORMER BOYFRIEND . . . . . I MOTHER-IN-LAW . . . . . J FATHER-IN-LAW . . . . . K OTHER N-LAW . . . . . L TEACHER . . . . . M EMPLOYER/SOMEONE AT WORK . . . . . N POLICE/SOLDIER . . . . . O OTHER _____ (SPECIFY) X	→ 1120 → 1120
1119A	Have you ever lost your pregnancy as a result of what your (last) husband/partner did to you?	YES . . . . . 1 NO 2	

NO.	QUESTIONS AND F LTERS	COD NG CATEGOR ES	SKIP
1120	CHECK 618: EVER HAD SEX? HAS EVER HAD SEX ☐ ↓ NEVER HAD SEX ☐ →		1125
1121	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	
1122	CHECK 601 AND 602: EVER MARRIED/LIVED WITH A MAN ☐ ↓ In the last 12 months, has anyone other than your husband/partner forced you to have sexual intercourse against your will? NEVER MARR ED/ 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	
1123	CHECK 1121 AND 1122: 1121 ='1' OR '3' **AND** 1122 ='2' OR '3' ☐ ↓ OTHER ☐ →		1126
1124	CHECK 1105A(h) and 1105A(i): 1105A(h) IS NOT '1' **AND** 1105A(i) IS NOT '1' ☐ ↓ OTHER ☐ →		1126
1125	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	1128
1126	How old were you the first time you were forced to have sexual intercourse or perform any other sexual acts?	AGE IN COMPLETED YEARS . . . . . ☐☐ DON'T KNOW 98	
1127	Who was the person who forced you at that time?	CURRENT HUSBAND/PARTNER . . . . . 01 FORMER HUSBAND/PARTNER . . . . . 02 CURRENT/FORMER BOYFR EN(. . . . . 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 (SPEC FY)	
1128	CHECK 1105A (a-i), 1114, 1122 AND 1125: AT LEAST ONE 'YES' ☐ ↓ NOT A SINGLE 'YES' ☐ →		1132
1129	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	1131
1130	From whom have you sought help? Anyone else? RECORD ALL MENTIONED.	OWN FAM LY . . . . . A HUSBAND/PARTNER'S FAM LY . . . . . B CURRENT/LAST/LATE HUSBAND/PARTNER . . . . . C CURRENT/FORMER BOYFR EN(. . . . . D MALE FRIENC . . . . . E FEMALE FRIEND . . . . . F NEIGHBOR . . . . . G RELIGIOUS LEADER . . . . . H DOCTOR/MEDICAL PERSONNEI . . . . . I POLICE . . . . . J LAWYER . . . . . K SOCIAL SERVICE ORGANIZATION . . . . . L COMMUNITYLEADER/LOCAL ADMIN . . . . . M OTHER _____ X (SPECIFY)	1132

NO.	QUESTIONS AND F LTERS	COD NG CATEGOR ES	SKIP
1131	Have you ever told any one else about this?	YES . . . . . 1 NO 2	
1132	As far as you know, did your father ever beat your mother?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	
1132A	As far as you know, did your mother ever beat your father?	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.

			YES ONCE	YES, MORE THAN ONCE	NO
1133	D D YOU HAVE TO NTERRUPT THE INTERVIEW BECAUSE SOME ADULT WAS TRY NG TO LISTEN, OR CAME NTO THE ROOM, OR NTERFERED N ANY OTHER WAY?	HUSBAND	1	2	3
		OTHER MALE ADULT	1	2	3
		FEMALE ADULT	1	2	3
1134	INTERVIEWER'S COMMENTS / EXPLANATION FOR NOT COMPLETING THE DOMESTIC VIOLENCE MODULE				
1135	RECORD THE TIME.	HOURS			
		M NUTES			

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 N ANY BOX.
ALL MONTHS SHOULD BE FILLED IN.

INFORMATION TO BE CODED FOR EACH COLUMN

B RTHS PREGNANCIES CONTRACEPTIVE USE

B	B RTHS
P	PREGNANCIES
T	TERMINATIONS

0	NO METHOD
1	FEMALE STERILIZATION
2	MALE STERILIZATION
3	P LL
4	IUD
5	INJECTABLES
6	IMPLANTS
7	MALE CONDOM
8	FEMALE CONDOM
9	DIAPHRAGM
J	FOAM OR JELLY
K	LACTATIONAL AMENORRHEA METHOD
L	RHYTHM METHOD
M	WITHDRAWAL
X	OTHER _____

(SPECIFY)

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

SEPTEMBER 2008

GHANA DEMOGRAPHIC AND HEALTH SURVEY
MAN'S QUESTIONNAIRE

MINISTRY OF HEALTH, GHANA | GHANA STATISTICAL SERVICE

IDENTIFICATION

LOCALITY NAME _____

NAME OF HOUSEHOLD HEAD _____

EA NUMBER . . . . . | | | |

STRUCTURE NUMBER . . . . . | | | |

HOUSEHOLD NUMBER . . . . . | | | |

REGION . . . . . | | |

DISTRICT . . . . . | | |

URBAN/RURAL (URBAN = 1; RURAL = 2) . . . . . |_|

CITY/LARGE TOWN/SMALL TOWN/VILLAGE (CITY=1, LARGE TOWN=2, SMALL TOWN=3, VILLAGE=4) |_|

NAME AND LINE NUMBER OF MAN _____ | | |

MAN SELECTED FOR DV INTERVIEW (YES = 1; NO = 2) . . . . . |_|

CHECK COLUMN 10 IN HOUSEHOLD QUESTIONNAIRE. IF BOX IS MARKED 'DV' RECORD 1.
MAKE SURE LINE NUMBER CORRESPONDS TO THE MAN'S LINE NUMBER SELECTED FOR DV.

INTERVIEWER VISITS

	1	2	3	FINAL VISIT
DATE	_____	_____	_____	DAY
				MONTH
				YEAR 2008
INTERVIEWER'S NAME	_____	_____	_____	INT. NUMBER
RESULT*	_____	_____	_____	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 OF QUESTIONNAIRE: 1 LANGUAGE OF INTERVIEW: |_| LANGUAGE OF RESPONDENT |_|

LANGUAGE CODES: ENGLISH = 1, AKAN = 2, GA = 3, EWE = 4, NZEMA = 5, DAGBANI = 6, OTHER = 7 (SPECIFY) _____

TRANSLATOR USED: (YES = 1, NO = 2) |_|

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

SECTION 1. RESPONDENT'S BACKGROUND

INTRODUCTION AND CONSENT

INFORMED CONSENT

Hello. My name is _____ and I am working for Ghana Statis ical Service and Ministry of Health. We are conducting a national survey to ask men and 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 about 20 minutes to complete. Whatever information you provide will be kept strictly 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 he 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 INTERVIEWEI . . . 2 → END

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
101	RECORD THE TIME.	HOUR . . . . . ☐☐ MINUTES . . . . . ☐☐	
102	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	→ 104
103	Just before you moved here, did you live in a city, in a town, or in the countryside?	CITY . . . . . 1 TOWN . . . . . 2 COUNTRYSIDE 3	
104	In the last 12 months, on how many separate occasions have you traveled away from your home community and slept away?	NUMBER OF TRIPS . . . . . ☐☐ NONE 00	→ 106
105	In the last 12 months, have you been away from your home community for more than one mon h at a time?	YES . . . . . 1 NO 2	
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 bir hday? 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, middle/JSS, secondary/SSS or higher?	PRIMARY . . . . . 1 MIDDLE/JSS . . . . . 2 SECONDARY/SSS . . . . . 3 HIGHER 4	
110	What is the highest grade you completed at that level?	GRADE . . . . . ☐☐	
111	CHECK 109: PRIMARY OR MIDDLE/JSS ☐ ↓ SECONDARY/SSS OR HIGHER ☐ →		→ 115

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
112	Now I would like you to read this sentence to me. SHOW LITERACY CARD 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?	CATHOLIC . . . . . 01 ANGLICAN . . . . . 02 METHODIST . . . . . 03 PRESBYTERIAN . . . . . 04 PENTECOSTAL/CHARISMATIC . . . . . 05 OTHER CHRISTIAN . . . . . 06 MUSLIM . . . . . 07 TRADITIONAL/SPIRITUALIST . . . . . 08 NO RELIGION . . . . . 09 OTHER _____ 96 (SPECIFY)	
119	To which ethnic group do you belong?	AKAN . . . . . 01 GA/DANGME . . . . . 02 EWE . . . . . 03 GUAN . . . . . 04 MOLE-DAGBANI . . . . . 05 GRUSSI . . . . . 06 GRUMA . . . . . 07 MANDE . . . . . 08 OTHER _____ 96 (SPECIFY)	

SECTION 2. REPRODUCTION

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
201	Now I would like to ask about any children you have had during your life. I am interested in all of he children that are biologically yours, even if they are not legally yours or do not have your last name. Have you ever fathered any children with any woman?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	→ 206
202	Do you have any sons or daughters that you have fathered 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 that you have fathered who are alive but do not live with you?	YES . . . . . 1 NO 2	→ 206
205	How many sons are alive but do not live wi h you? And how many daughters are alive but do not live with you? IF NONE, RECORD '00'.	SONS ELSEWHERE . . . . . [ ][ ] DAUGHTERS ELSEWHERE . . . . [ ][ ]	
206	Have you ever fathered a son or a 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 DON'T KNOW 8	→ 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 CHILDREN . . . . . [ ][ ]	
209	CHECK 208: HAS HAD MORE THAN ONE CHILD ↓ HAS HAD ONLY ONE CHILD → 212 HAS NOT HAD ANY CHILDREN → 301		
210	Did all of the children you have fathered have the same biological mother?	YES . . . . . 1 NO 2	→ 212
211	In all, how many women have you fathered children with?	NUMBER OF WOMEN . . . . . [ ][ ]	
212	How old were you when your (first) child was born?	AGE IN YEARS . . . . . [ ][ ]	
213	CHECK 203 AND 205: AT LEAST ONE LIVING CHILD ↓ NO LIVING CHILDREN → 301		
214	How many years old is your (youngest) child?	AGE IN YEARS . . . . . [ ][ ]	
215	CHECK 214: (YOUNGEST) CHILD IS AGE 0-3 YEARS ↓ OTHER → 301		

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
216	What is the name of your (youngest) child? WRITE NAME OF (YOUNGEST) CHILD _____ (NAME OF (YOUNGEST) CHILD)		
217	When (NAME)'s mother was pregnant wi h (NAME), did she have any antenatal check-ups?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 3	→ 219
218	Were you ever present during any of those antenatal check-ups?	PRESENT . . . . . 1 NOT PRESENT 2	
219	Was (NAME) born in a hospital or health facility?	HOSPITAL/HEALTH FACILITY . . . . . 1 OTHER 2	→ 221
220	What was he main reason why (NAME)'s mother did not deliver in a hospital or health facility?	COSTS TOO MUCH . . . . . 01 FACILITY NOT OPEN . . . . . 02 TOO FAR/NO TRANSPORTATION . . . 03 DON'T TRUST FACILITY/POOR QUALITY SERVICE . . . . . 04 NO FEMALE PROVIDER AT FACILITY . 05 NOT THE FIRST CHILD . . . . . 06 CHILD'S MOTHER DID NOT THINK IT WAS NECESSARY . . . . . 07 HE DID NOT THINK IT WAS NECESSARY . . . . . 08 FAMILY DID NOT THINK NECESSARY 09 FAMILY/HUSBAND DID NOT ALLOW 10 NOT CUSTOMARY 11 S/HE DID NOT KNOW WHERE TO G . . 12 HE COULD NOT ACCOMPANY HER . . 13 INCONVENTIENT SERVICE HOUR . . . . 14 LONG WAITING TIME . . . . . 15 OTHER _____ 96 (SPECIFY) DON"T KNOW 98	
221	When a child has diarrhea, how much fluid should he or she be given to drink: more than usual, he same amount as usual, less than usual, or should he or she not be given anything to drink at all?	MORE THAN USUAL . . . . . 1 ABOUT THE SAME . . . . . 2 LESS THAN USUAL . . . . . 3 NOTHING TO DRINK . . . . . 4 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 METHODS 02, 07, 11, AND 12, ASK 302 IF 301 HAS CODE 1 CIRCLED.		302 Have you ever used (METHOD)?
01	FEMALE STERILIZATION Women can have 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 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	
04	IUD Women can have a loop or coil placed inside them by a doctor or a nurse.	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	
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	
07	MALE CONDOM Men can put a rubber sheath on their penis before sexual ntercourse.	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	
09	DIAPHRAGM Women can place a thin flexible disk in their vagina before sexual intercourse.	YES . . . . . 1 NO 2	
10	FOAM OR JELLY Women can place a suppository, jelly, or cream in their vagina before sexual intercourse.	YES . . . . . 1 NO 2	
11	RHYTHM METHOD (CALENDAR) 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
12	WITHDRAWAL Men can be careful and pull out before climax.	YES . . . . . 1 NO 2	YES . . . . . 1 NO 2
13	LACTATIONAL AMENORRHEA METHOD (LAM)	YES . . . . . 1 NO 2	
14	EMERGENCY CONTRACEPTION As an emergency measure after sexual intercourse, women can take special pills at any time within 5 days to prevent pregnancy.	YES . . . . . 1 NO 2	
15	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

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
303	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	
304	In the last few months, have you discussed the practice of family planning with a health worker or health professional?	YES . . . . . 1 NO 2	
304A	In the last few months, have you discussed the practice of family planning with your wife/ cohabiting partner?	YES . . . . . 1 NO 2	
305	Now I would like to ask you about a woman's risk of pregnancy. From one menstrual period to the next, are there certain days when a woman is more likely to become pregnant if she has sexual intercourse?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	→ 307
306	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 BEG NS . . . . . 1 DURING HER PERIOD . . . . . 2 RIGHT AFTER HER PERIOD HAS ENDED . . . . . 3 HALFWAY BETWEEN TWO PERIODS . . . . . 4 OTHER _____ (SPECIFY) 6 DON'T KNOW 8	
307	Do you think that a woman who is breastfeeding her baby can become pregnant?	YES . . . . . 1 NO . . . . . 2 DEPENDS . . . . . 3 DON'T KNOW 8	
308	I will now read you some statements about contraception. Please tell me if you agree or disagree with each one. a) Contraception is women's business and a man should not have to worry about it. b) Women who use contraception may become promiscuous. c) Having too many children may be dangerous for a woman d) t is better not to have more children than we can afford e) Children in smaller families are more likely to succeed	AGREE DIS-AGREE DK CONTRACEPTION WOMAN'S BUS NESS . 1 2 8 WOMAN MAY BECOME PROMISCUOUS . . . . 1 2 8 DANGEROUS F/WOMAN 1 2 8 CH LDREN NOT AFFORD 1 2 8 CH LDREN SUCCEED 1 2 8	
309	CHECK 301 (07) KNOWS MALE CONDOM YES ↓ NO → 401		
310	Do you know of a place where a person can get condoms?	YES . . . . . 1 NO 2	→ 401
311	Where is that? Any other place? PROBE TO IDENTIFY EACH TYPE OF SOURCE AND CIRCLE THE APPROPRIATE CODE. IF UNABLE TO DETERM NE 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/POLYCLINIC . . . A GOVT. HEALTH CENTER . . . . . B GOVT. HEALTH POST/CHPS . . . . . C FAMILY PLANNING CLINIC . . . . . D MOBILE CLINIC . . . . . E F ELDWORKER/OUTREACH/ PEER EDUCATOR . . . . . F OTHER PUBLIC _____ (SPECIFY) G PRIVATE MEDICAL SECTOR PRIVATE HOSPITAL/CL NIC . . . . . H PRIVATE DOCTOR . . . . . I PHARMACY . . . . . J CHEMICAL/DRUG STORE K FP/PPAG CLINIC . . . . . L MATERNITY HOME . . . . . M OTHER PRIVATE MEDICAL _____ (SPECIFY) N OTHER SOURCE SHOP/MARKET . . . . . O CHURCH . . . . . P COMMUNITY VOLUNTEER . . . . . Q FRIEND/RELATIVE . . . . . R OTHER _____ (SPECIFY) X	
312	If you wanted to, could you yourself get a condom?	YES . . . . . 1 NO 2	

SECTION 4. MARRIAGE AND SEXUAL ACTIVITY

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
401	Are you currently married or living together with a woman as if married?	YES, CURRENTLY MARRIED . . . . . 1 YES, LIVING WITH A WOMAN . . . . . 2 NO, NOT IN UNION 3	→ 404
402	Have you ever been married or lived together with a woman as if married?	YES, FORMERLY MARRIED . . . . . 1 YES, LIVED WITH A WOMAN . . . . . 2 NO 3	→ 413
403	What is your marital status now: are you widowed, divorced, or separated?	WIDOWED . . . . . 1 DIVORCED . . . . . 2 SEPARATED 3	→ 410
404	Is your wife/partner living with you now or is she staying elsewhere?	LIVING WITH HIM . . . . . 1 STAYING ELSEWHERE 2	
405	Do you have more than one wife or woman you live with as if married?	YES . . . . . 1 NO 2	→ 407
406	Altogether, how many wives do you have or other partners do you live with as if married?	TOTAL NUMBER OF WIVES AND LIVE-IN PARTNERS . . .	
407	CHECK 405: ONE WIFE/ PARTNER → Please tell me the name of (your wife/the woman you are living with as if married). MORE THAN ONE WIFE/ PARTNER → Please tell me the name of each of your current wives and/or of each woman you are living with as if married. RECORD THE NAME AND THE LINE NUMBER FROM THE HOUSEHOLD QUESTIONNAIRE FOR EACH WIFE AND LIVE-IN PARTNER. IF A WOMAN IS NOT LISTED IN THE HOUSEHOLD, RECORD '00'. ASK 408 FOR EACH PERSON.	NAME / LINE NUMBER _____ ☐☐ _____ ☐☐ _____ ☐☐ _____ ☐☐	408 How old was (NAME) on her last birthday? AGE ☐☐ ☐☐ ☐☐ ☐☐	
409	CHECK 407: ONE WIFE/ PARTNER MORE THAN ONE WIFE/ PARTNER		→ 411A
410	Have you been married or lived with a woman only once or more than once?	ONLY ONCE . . . . . 1 MORE THAN ONCE 2	→ 411A
411 411A	In what month and year did you start living with your (wife/ partner)? Now I would like to ask a question about your first wife/partner. In what month and year did you start living with your first wife/ partner?	MONTH . . . . . ☐☐ DON'T KNOW MONTH . . . . . 98 YEAR . . . . . ☐☐☐☐ DON'T KNOW YEAR 9998	→ 413
412	How old were you when you first started living with her?	AGE . . . . . ☐☐	

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
413	CHECK FOR THE PRESENCE OF OTHERS. BEFORE CONTINUING, MAKE EVERY EFFORT TO ENSURE PRIVACY.		
414	Now I would like 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 he very first time?	NEVER HAD SEXUAL INTERCOURSE . . . . . 00 AGE IN YEARS . . . . . ☐☐ FIRST TIME WHEN STARTED LIVING WITH (FIRST) WIFE/PARTNER 95	→ 417 → 417
415	CHECK 107: AGE 15-24 ☐ ↓ AGE 25-59 ☐		→ 501
416	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	→ 501
417	CHECK 107: AGE 15-24 ☐ ↓ AGE 25-59 ☐		→ 419
418	The first time you had sexual intercourse, was a condom used?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW/DON'T REMEMBER . . . 8	
419	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 ☐☐	→ 435

		LAST SEXUAL PARTNER	SECOND-TO-LAST SEXUAL PARTNER	THIRD-TO-LAST SEXUAL PARTNER
420	Now I would like to ask you some ques ions 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 422			
421	When was the last time you had sexual intercourse with this person?		DAYS . 1 [ ][ ] WEEKS 2 [ ][ ] MONTHS 3 [ ][ ]	DAYS . 1 [ ][ ] WEEKS 2 [ ][ ] MONTHS 3 [ ][ ]
422	The last time you had sexual intercourse (with this second/third person), was a male condom used?	YES . . . . . 1 NO . . . . . 2 (SKIP TO 424) ←	YES . . . . . 1 NO . . . . . 2 (SKIP TO 424) ←	YES . . . . . 1 NO . . . . . 2 (SKIP TO 424) ←
423	Was a condom used 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
424	What was your relationship to this (second/third) person with whom you had sexual intercourse? IF GIRLFRIEND: Were you living together as if married? IF YES, CIRCLE '2'. IF NO, CIRCLE '3'.	W FE . . . . . 1 (SKIP TO 426) ← LIVE- N PARTNER . . . . 2 G RLFRIEND NOT LIV NG WITH RESPONDENT . . . . 3 CASUAL ACQUA NTANCE . . . 4 PROSTITUTE . . . . . 5 OTHER _____ 6 (SPEC FY)	W FE . . . . . 1 (SKIP TO 426) ← LIVE-IN PARTNER . . . . 2 GIRLFR END NOT LIVING WITH RESPONDENT . . . . 3 CASUAL ACQUAINTANCE . . . 4 PROSTITUTE . . . . . 5 OTHER _____ 6 (SPECIFY)	WIFE . . . . . 1 (SK P TO 426) ← LIVE-IN PARTNER . . . . 2 GIRLFR END NOT LIVING WITH RESPONDENT . . . . 3 CASUAL ACQUAINTANCE . . . 4 PROSTITUTE . . . . . 5 OTHER _____ 6 (SPECIFY)
425	For how long (have you had/did you have) a sexual relationship with this (second/third) 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 [ ][ ]
426	The last time you had sexual intercourse with this (second/third) person, did you or this person drink alcohol?	YES . . . . . 1 NO . . . . . 2 (SKIP TO 428) ←	YES . . . . . 1 NO . . . . . 2 (SKIP TO 428) ←	YES . . . . . 1 NO . . . . . 2 (SKIP TO 429) ←
427	Were you or your partner drunk at that time? IF YES: Who was drunk?	RESPONDENT ONLY 1 PARTNER ONLY . . . 2 RESPONDENT AND PARTNER BOTH . 3 NEITHER 4	RESPONDENT ONLY 1 PARTNER ONLY . . . 2 RESPONDENT AND PARTNER BOTH . 3 NEITHER 4	RESPONDENT ONLY 1 PARTNER ONLY . . . 2 RESPONDENT AND PARTNER BOTH . 3 NEITHER 4
428	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 421 IN NEXT COLUMN) ← NO . . . . . 2 (SKIP TO 430) ←	YES . . . . . 1 (GO BACK TO 421 IN NEXT COLUMN) ← NO . . . . . 2 (SKIP TO 430) ←	
429	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
430	CHECK 424 (ALL COLUMNS): AT LEAST ONE PARTNER IS PROSTITUTE ☐ NO PARTNERS ARE PROSTITUTES ☐ → 432		
431	CHECK 424 AND 422 (ALL COLUMNS): CONDOM USED WITH EVERY PROSTITUTE ☐ → 434 OTHER ☐ → 434A		
432	In the last 12 months, did you pay anyone in exchange for having sexual intercourse?	YES . . . . . 1 NO . . . . . 2 → 434A	
433	The last time you paid someone in exchange for having sexual intercourse, was a condom used?	YES . . . . . 1 NO . . . . . 2 → 434A	
434	Was a condom used during sexual intercourse every time you paid someone in exchange for having sexual intercourse in the last 12 months?	YES . . . . . 1 NO . . . . . 2 DK 8	
434A	In total, with how many different people have you had sexual intercourse in the last month? IF NON-NUMERIC ANSWER, PROBE TO GET AN ESTIMATE. IF NUMBER OF PARTNERS IS GREATER THAN 95, WRITE '95.'	NUMBER OF PARTNERS IN MONTH . . . . . ☐☐ DON'T KNOW 98	
435	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	
436	CHECK 422, MOST RECENT PARTNER (FIRST COLUMN): NOT ASKED ☐ → 442 CONDOM USED ☐ NO CONDOM USED ☐ → 442		
437	You told me that a condom was used the last time you had sex. May I see the package of condoms you were using at that time? RECORD NAME OF BRAND IF PACKAGE SEEN.	PACKAGE SEEN . . . . . 1 BRAND NAME _____ (SPECIFY) ☐☐ → 439 DOES NOT HAVE/NOT SEEN 2	
438	Do you know the brand name of he condom used at that time? RECORD NAME OF BRAND.	BRAND NAME _____ (SPECIFY) ☐☐ DON'T KNOW 98	
439	How many condoms did you get the last time?	NUMBER OF CONDOMS . . . . . ☐☐☐ DON'T KNOW 998	
440	The last time you obtained the condoms, how much did you pay in total, including the cost of the condom(s) and any consultation you may have had?	COST . . . . . ☐☐.☐☐ FREE . . . . . 99.95 DON'T KNOW 99.98	

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
441	From where did you obtain the condom the last time? PROBE TO IDENTIFY 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 GOVT. HOSPITAL/POLYCLINIC . . . . 11 GOVT. HEALTH CENTER . . . . . 12 GOVT. HEALTH POST/CHPS . . . . 13 FAMILY PLANNING CLINIC . . . . . 14 MOBILE CLINIC . . . . . 15 FIELDWORKER/OUTREACH/ PEER EDUCATOR . . . . . 16 OTHER PUBLIC _____ 17 (SPECIFY) PRIVATE MEDICAL SECTOR PRIVATE HOSPITAL/CLINIC . . . . . 20 PRIVATE DOCTOR . . . . . 21 PHARMACY . . . . . 22 CHEMICAL/DRUG STORE . . . . . 23 FP/PPAG CLINIC . . . . . 24 MATERNITY HOME . . . . . 25 OTHER PRIVATE MEDICAL _____ 26 (SPECIFY) OTHER SOURCE SHOP/MARKET . . . . . 31 CHURCH . . . . . 32 COMMUNITY VOLUNTEER . . . . . 33 FRIEND/RELATIVE . . . . . 34 OTHER _____ 96 (SPECIFY) DON'T KNOW 98	
442	CHECK 302 (02): RESPONDENT EVER STERILIZED NO ↓ YES → 501		
443	The last time you had sex did you or your partner use any method (other than a condom) to avoid or prevent a pregnancy?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	→ 501
444	What method did you or your partner use? PROBE: Did you or your partner use any other me hod to prevent pregnancy? RECORD ALL MENTIONED.	FEMALE STERILIZATION . . . . . A PILL . . . . . B IUD . . . . . C INJECTABLES . . . . . D IMPLANTS . . . . . E FEMALE CONDOM . . . . . F DIAPHRAGM . . . . . G FOAM/JELLY . . . . . H LAM . . . . . I RHYTHM METHOD . . . . . J WITHDRAWAL . . . . . K OTHER _____ X (SPECIFY)	

SECTION 5. FERTILITY PREFERENCES

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
501	CHECK 407: ONE OR MORE WIVES/PARTNERS ☐ QUESTION NOT ASKED ☐ →		508
502	CHECK 302: MAN NOT STERILIZED ☐ MAN STERILIZED ☐ →		508
503	(Is your wife (partner)/Are any of your wives (partners)) currently pregnant?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	
504	CHECK 503: NO WIFE/PARTNER PREGNANT OR DON'T KNOW ☐ 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? WIFE(WIVES)/ PARTNER(S) PREGNANT ☐ Now I have some questions about the future. After the child(ren) you and your (wife(wives)/partner(s)) 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 COUPLE INFECUND . . . . . 3 WIFE (WIVES)/PARTNER(S) STERILIZED . . . . . 4 UNDECIDED/DON'T KNOW 8	→ 508
505	CHECK 407: ONE WIFE/ PARTNER ☐ MORE THAN ONE WIFE/ PARTNER ☐ →		507
506	CHECK 503: WIFE/PARTNER NOT PREGNANT OR DON'T KNOW ☐ How long would you like to wait from now before the birth of (a/another) child? WIFE/PARTNER 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 COUPLE INFECUND . . . . . 994 OTHER _____ 996 (SPECIFY) DON'T KNOW 998	→ 508
507	How long would you like to wait from now before the birth of (a/another) child?	MONTHS . . . . . 1 ☐☐ YEARS . . . . . 2 ☐☐ SOON/NOW . . . . . 993 HE/ALL HIS WIVES/PARTNERS ARE INFECUND . . . . . 994 OTHER _____ 996 (SPECIFY) DON'T KNOW 998	

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
508	CHECK 203 AND 205: 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 NUMBER . . . . . ☐☐ OTHER _____ 96 (SPECIFY)	→ 601 → 601
509	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)	

SECTION 6. EMPLOYMENT AND GENDER ROLES

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
601	Have you done any work in the last seven days?	YES . . . . . 1 NO 2	→604
602	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, or any o her such reason?	YES . . . . . 1 NO 2	→604
603	Have you done any work in the last 12 months?	YES . . . . . 1 NO 2	→613
604	What is your occupa ion, that is, what kind of work do you mainly do?	_____ ☐☐ _____ _____	
605	CHECK 604: WORKS IN AGRICULTURE ☐ DOES NOT WORK IN AGRICULTURE ☐		→607
606	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	
607	Do you do his 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	
608	Do you usually work throughout he 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	
609	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	
610	CHECK 407: ONE OR MORE WIVES/PARTNERS ☐ QUESTION NOT ASKED ☐		→613
611	CHECK 609: CODE 1 OR 2 CIRCLED ☐ OTHER ☐		→613
612	Who usually decides how the money you earn will be used: mainly you, mainly your (wife (wives)/partner(s)), or you and your (wife (wives)/partner(s)) jointly?	RESPONDENT . . . . . 1 WIFE(WIVES)/PARTNER(S) . . . . . 2 RESPONDENT AND WIFE (WIVES)/ PARTNER(S) JOINTLY . . . . . 3 OTHER _____ 6 SPECIFY	

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
613	In a couple, who do you think should have the greater say in each of the following decisions: the husband, the wife or both equally:	HUS-BAND / WIFE / BOTH EQUALLY / DON'T KNOW/ DEPENDS	
	a) making major household purchases?	a) 1 2 3 8	
	b) making purchases for daily household needs?	b) 1 2 3 8	
	c) deciding about visits to the wife's family or relatives?	c) 1 2 3 8	
	d) deciding what to do with the money she earns for her work?	d) 1 2 3 8	
	e) deciding how many children to have?	e) 1 2 3 8	
614	I will now read you some statements about pregnancy. Please tell me if you agree or disagree with them.	AGREE / DIS-AGREE / DK	
	a) Childbearing is a woman's concern and there is no need for the father to get involved.	CHILDBEARING WOMAN'S CONCERN 1 2 8	
	b) It is crucial for the mo her's and child's health that a woman have assistance from a doctor or nurse at delivery.	DOCTOR/NURSE'S ASSISTANCE CRUCIAL 1 2 8	
615	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 situa ions:	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	
616	Do you think that if a woman refuses to have sex with her husband when he wants her to, he has the right to…	YES / NO / DON'T KNOW/ DEPENDS	
	a) Get angry and reprimand her?	a) 1 2 8	
	b) Refuse to give her money or other means of support?	b) 1 2 8	
	c) Use force and have sex with her even if she doesn't want to?	c) 1 2 8	
	d) Go ahead and have sex with another woman?	d) 1 2 8	

SECTION 7. HIV/AIDS

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
701	Now I would like to talk about something else. Have you ever heard of an illness called AIDS?	YES . . . . . 1 NO 2	→ 733
702	Can people reduce their chances 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	
703	Can people get the AIDS virus from mosquito bites?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	
704	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	
705	Can people get the AIDS virus by sharing food with a person who has AIDS?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	
706	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	
707	Can people get the AIDS virus because of witchcraft or other supernatural means?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	
708	Is it possible for a healthy-looking person to have the AIDS virus?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	
709	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	
710	CHECK 709: AT LEAST ONE 'YES' ↓ OTHER →		→ 712
711	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	
712	Have you heard about special antiretroviral drugs (USE LOCAL NAME) that people infected with the AIDS virus can get from a doctor or a nurse to help them live longer?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	
712A	CHECK FOR PRESENCE OF OTHERS. BEFORE CONTINUING, MAKE EVERY EFFORT TO ENSURE PRIVACY.		
713	I don't want to know the results, but have you ever been tested to see if you have the AIDS virus?	YES . . . . . 1 NO 2	→ 718
714	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	
715	The last time you had the test, did you yourself ask for the test, was it offered to you and you accepted, or was it required?	ASKED FOR THE TEST . . . . . 1 OFFERED AND ACCEPTED . . . . . 2 REQUIRED 3	
716	I don't 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
717	Where was the test done? PROBE TO IDENTIFY THE TYPE OF SOURCE AND CIRCLE THE APPROPRIATE CODE. 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)	PUBLIC SECTOR GOVT. HOSPITAL/POLYCLINIC . . . 11 GOVT. HEALTH CENTER . . . . . 12 GOVT. HEALTH POST/CHPS . . . . . 13 STAND-ALONE VCT CENTER . . . 14 FAMILY PLANNING CLINIC . . . . . 15 MOBILE CLINIC . . . . . 16 FIELDWORKER/OUTREACH/ PEER EDUCATOR . . . . . 17 OTHER PUBLIC _____ 18 (SPECIFY) PRIVATE MEDICAL SECTOR PRIVATE HOSPITAL/CLINIC/ PRIVATE DOCTOR . . . . . 21 STAND-ALONE VCT CENTER . . . 22 PHARMACY . . . . . 23 CHEMICAL/DRUG STORE 24 FP/PPAG CLINIC . . . . . 25 MATERNITY HOME . . . . . 26 OTHER PRIVATE MEDICAL _____ 27 (SPECIFY) OTHER _____ 96 (SPECIFY)	→ 720
718	Do you know of a place where people can go to get tested for the AIDS virus?	YES . . . . . 1 NO 2	→ 720
719	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 VCT CENTER, OR CLINIC IS PUBLIC OR PRIVATE MEDICAL, WRITE THE NAME OF THE PLACE. _____ (NAME OF PLACE)	PUBLIC SECTOR GOVT. HOSPITAL/POLYCLINIC . . . A GOVT. HEALTH CENTER . . . . . B GOVT. HEALTH POST/CHPS . . . . . C STAND-ALONE VCT CENTER . . . D FAMILY PLANNING CLINIC . . . . . E MOBILE CLINIC . . . . . F FIELDWORKER/OUTREACH/ PEER EDUCATOR . . . . . G OTHER PUBLIC _____ (SPECIFY) PRIVATE MEDICAL SECTOR PRIVATE HOSPITAL/CLINIC/ H PRIVATE DOCTOR . . . . . I STAND-ALONE VCT CENTER . . . J PHARMACY . . . . . K CHEMICAL/DRUG STORE . . . . . L FP/PPAG CLINIC . . . . . M MATERNITY HOME . . . . . N OTHER PRIVATE MEDICAL _____ O (SPECIFY) OTHER _____ X (SPECIFY)	

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
720	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	
721	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	
722	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	
723	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	
731	Should children age 12-14 be taught about using a condom to avoid getting AIDS?	YES . . . . . 1 NO . . . . . 2 DK/NOT SURE/DEPENDS 8	
732	Should children age 12-14 be taught to wait until they get married to have sexual intercourse in order to avoid getting AIDS?	YES . . . . . 1 NO . . . . . 2 DK/NOT SURE/DEPENDS 8	
733	CHECK 701: 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 infec ions that can be transmitted through sexual contact?	YES . . . . . 1 NO 2	
734	CHECK 414: HAS HAD SEXUAL INTERCOURSE HAS NOT HAD SEXUAL INTERCOURSE → 742		
735	CHECK 733: HEARD ABOUT OTHER SEXUALLY TRANSMITTED INFECTIONS? YES NO → 737		
736	Now I would like to ask you some questions about your health in the last 12 months. During the last 12 months, have you had a disease which you got through sexual contact?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	
737	Sometimes men experience an abnormal discharge from their penis. During the last 12 months, have you had an abnormal discharge from your penis?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
738	Sometimes men have a sore or ulcer near their penis. During the last 12 months, have you had a sore or ulcer near your penis?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	
739	CHECK 736, 737, AND 738: HAS HAD AN INFECTION (ANY 'YES') HAS NOT HAD AN INFECTION OR DOES NOT KNOW		→ 742
740	The last time you had (PROBLEM FROM 736/737/738), did you seek any kind of advice or treatment?	YES . . . . . 1 NO 2	→ 742
741	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 GOVT. HOSPITAL/POLYCLINIC . . . A GOVT. HEALTH CENTER . . . . . B GOVT. HEALTH POST/CHPS . . . . . C FAMILY PLANNING CLINIC . . . . . D STAND-ALONE VCT CENTER . . . E FIELDWORKER/OUTREACH/ PEER EDUCATOR . . . . . F OTHER PUBLIC _____ G (SPECIFY) PRIVATE MEDICAL SECTOR PRIVATE HOSPITAL/CLINIC/ PRIVATE DOCTOR . . . . . H STAND-ALONE VCT CENTER . . . . . I PHARMACY . . . . . J CHEMICAL/DRUG STORE . . . . . K FP/PPAG CLINIC . . . . . L MATERNITY HOME . . . . . M OTHER PRIVATE MEDICAL _____ N (SPECIFY) OTHER SOURCE SHOP/MARKET . . . . . O FRIEND/RELATIVE . . . . . P TRADITIONAL PRACTICIONER . . . Q OTHER _____ X (SPECIFY)	
742	Husband and wives do not always agree in everything. If a wife knows her husband has a disease that she can get during sexual intercourse, is she justified in refusing to have sex with him?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	
743	If a wife knows her husband has a disease that she can get during sexual intercourse, is she justified in asking that they use a condom when they have sex?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	
744	Is a wife justified in refusing to have sex with her husband when she is tired or not in the mood?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	
745	Is a wife justified in refusing to have sex with her husband when she knows her husband has sex with other women?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	

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 ano her? 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 _____ (SPECIFY) X 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	
806	Now I would like to ask you some other questions relating to health matters. Have you had an injection for any reason in the last 12 mon hs? IF YES: How many injections have you had? IF NUMBER OF INJECTIONS IS GREATER THAN 90, OR DAILY FOR 3 MONTHS OR MORE, RECORD '90'. IF NON-NUMERIC ANSWER, PROBE TO GET AN ESTIMATE.	NUMBER OF INJECTIONS . . . ☐☐ NONE 00	→ 810
807	Among these injections, how many were administered by a doctor, a nurse, a pharmacist, a dentist, or any other health worker? IF NUMBER OF INJECTIONS IS GREATER THAN 90, OR DAILY FOR 3 MONTHS OR MORE, RECORD '90'. IF NON-NUMERIC ANSWER, PROBE TO GET AN ESTIMATE.	NUMBER OF INJECTIONS . . . ☐☐ NONE 00	→ 810
808	The last time you had an injection given to you by a heal h worker, where did you go to get the injection? 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 GOVT. HOSPITAL/POLYCLINIC . . . 11 GOVT. HEALTH CENTER . . . . . 12 GOVT. HEALTH POST/CHPS . . . . . 13 STAND-ALONE VCT CENTER . . . 14 MOBILE CLINIC . . . . . 15 FIELDWORKER/OUTREACH/ PEER EDUCATOR . . . . . 16 OTHER PUBLIC _____ (SPECIFY) 17 PRIVATE MEDICAL SECTOR PRIVATE HOSPITAL/CLINIC/ PRIVATE DOCTOR . . . . . 21 STAND-ALONE VCT CENTER . . . 22 PHARMACY . . . . . 23 CHEMICAL/DRUG STORE . . . . . 24 OTHER PRIVATE MEDICAL _____ (SPECIFY) 26 OTHER PLACE AT HOME . . . . . 31 OTHER _____ (SPECIFY) 96	

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
809	Did the person who gave you hat injection take the syringe and needle from a new, unopened package?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	
810	Do you curren ly smoke cigarettes?	YES . . . . . 1 NO 2	→ 812
811	In he last 24 hours, how many sticks of cigarettes did you smoke?	CIGARETTES	
812	Do you curren ly smoke or use any other type of tobacco?	YES . . . . . 1 NO 2	→ 813A
813	What (other) type of tobacco do you currently smoke or use? RECORD ALL MENTIONED.	PIPE . . . . . A CHEWING TOBACCO . . . . . B SNUFF . . . . . C CIGAR . . . . . D OTHER _____ X (SPECIFY)	
813A	Do you consume alcoholic beverages?	YES . . . . . 1 NO 2	→ 814
813B	In he last 7 days (a week) did you drink an alcoholic beverage? IF 'YES', PROBE: How many times?	ONCE . . . . . 01 2-3 TIMES . . . . . 02 4 TIMES OR MORE . . . . . 03 NONE 04	
813C	How often do you get drunk: often, only sometimes, or never?	OFTEN . . . . . 01 SOMETIMES . . . . . 02 NEVER 03	
814	Do you have any heal h insurance or are you a member of a mutual health organization?	YES . . . . . 1 NO 2	→ 821
815	What type of health insurance do you have? RECORD ALL MENTIONED.	NATIONAL /DISTRICT HEALTH INSURANCE(NHIS) . . . . . A HEALTH INSURANCE THROUGH EMPLOYER . . . . . B MUTUAL HEALTH ORGANIZATION/ COMMUNITY-BASED HEALTH INSURANCE . . . . . C OTHER PRIVATELY PURCHASED COMMERCIAL HEALTH INSURANCE. D OTHER _____ X (SPECIFY)	
815A	CHECK 815: CODE 'A' FOR NHIS NOT CIRCLED CODE 'A' FOR NHIS CIRCLED		→ 815C
815B	Why have you not registered with he Na ional Health Insurance Scheme (NHIS)? RECORD ALL MENTIONED	NOT HEARD OF NHIS . . . . . A CANNOT AFFORD PREMIUM . . . . . B DO NOT TRUST . . . . . C DON'T NEED HEALTH INSURANCE . . . D NHIS DOES NOT COVER HEALTH SERVICES I NEED . . . . . E OTHER _____ X (SPECIFY)	→ 815I
815C	Did you pay your NHIS membership yourself?	YES, PAID MYSELF . . . . . 01 YES, PAID BY A RELATIVE/FRIEND 02 YES, PAID BY EMPLOYER/SSNIT . . . 03 NO, EXEMPT AS ELDERLY (70+) . . . 04 NO, EXEMPT AS PENSIONER . . . . . 05 NO, EXEMPT AS INDIGENT (POOR) 06 NO, OTHER _____ 96 (SPECIFY)	

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
815D	Do you hold a valid National Health Insurance Scheme (NHIS) card? IF ANSWER IS 'YES', REQUEST TO SEE THE CARD	YES, CARD SEEN . . . . . 1 YES, CARD NOT SEEN . . . . . 2 NO 3	→ 815F
815E	Why do you <u>not</u> have a valid NHIS card?	REGISTERED, NOT PAID FULLY . . . 1 REGISTERED, CARD NOT RECEIVED . . . . . 2 REGISTERED, WAITING PERIOD . . 3 NOT RENEWED REGISTRATION . . 4 LOST NHIS CARD . . . . . 5 OTHER _____ 6 (SPECIFY)	→ 815I → 815G → 815I
815F	How many weeks did it take you to obtain your NHIS card?	NUMBER OF WEEKS [ ][ ] DON'T KNOW 98	→ 815I
815G	Do you plan to renew the NHIS card?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW/NOT SURE 8	→ 815I → 815I
815H	Why do you <u>not</u> want to renew he NHIS card? Anything else? RECORD ALL MENTIONED.	HAVE NOT BEEN SICK . . . . . A PREMIUM EXPENSIVE . . . . . B STILL PAY OUT OF POCKET . . . . . C WORSE QUALITY CARE WITH CARD . D WAITING TIME FOR CARD LONG . . E USED SERVICES NOT COVERED . . F DID NOT USE ANY HEALTH SERVICES G USE CLINICS OR TRADITIONAL PRACTITIONERS WHO ARE NOT COVERED . . . . . H OTHER _____ X (SPECIFY)	
815I	Do you have to pay out of pocket for drugs and services?	YES . . . . . 1 NO . . . . . 2 SOMETIMES 3	
815J	Are there any services that you need from a health provider that are not covered by NHIS?	YES . . . . . 1 NO 2	→ 815L
815K	What are these services? Anything else? RECORD ALL MENTIONED.	FAMILY PLANNING . . . . . A LABORATORY INVESTIGATIONS . . . . . B CARE FOR NEWBORN FOR UP TO 3 MONTHS . . . . . C PROSTATE CANCER SCREENING/ TREATMENT . . . . . D OTHER _____ X (SPECIFY)	
815L	In your opinion, do NHIS card holders get better/same/worse service than o hers?	BETTER . . . . . 1 SAME . . . . . 2 WORSE . . . . . 3 DON'T KNOW/NOT SURE 8	
815M	In your opinion, did you receive good service last time you were treated at a clinic or hospital? IF NO, PROBE	YES . . . . . 1 NO, WAITING TIMES WERE TOO LONG 2 NO, STAFF NOT POLITE . . . . . 3 NO, DID NOT RECEIVE ENOUGH INFORMATION ABOUT ILLNESS AND TREATMENT . . . . . 4 OTHER _____ . . . . 6 (SPECIFY)	

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
821	I am going to ask you about the time you spent being physically active in the last 7 days. This is about the activities you do at work, as part of your house and yard work, to get from place to place, in your spare ime, exercise or sport. Now, think about all the vigorous activities which take hard physical effort that you did in the past 7 days: activties that make you breathe much harder han normal and may include heavy lifting, digging, jogging, or fast bicycling.Think about only those physical ac ivities that you did at least 15 minutes at a time. In he last 7 days, on how many days did you do vigorous physical ac ivities that lasted for at least 15mins each time? IF 'NONE' RECORD '0'	NUMBER OF DAYS . . . . . ☐ DON'T KNOW 8	
822	How many hours do you rest a day, including naps and sleep bo h during day and night?	1-3 HOURS . . . . . 1 4-6 HOURS . . . . . 2 7-9 HOURS . . . . . 3 10 AND MORE HOURS . . . . . 4 DON'T KNOW 8	
823	Now I would like to ask you about liquids and foods that you consume. How many glasses of water do you drink in one day on average? IF MORE THAN 9, RECORD '9' IF 'NONE' RECORD '0'	NUMBER OF GLASSES ☐	
824	In a typical week, on how many days do you eat fruits, for example mangoes, paw paw, banana, orange, avocados, tomatoes, passion fruit, etc? IF 'NONE' RECORD '0'	NUMBER OF DAYS . . . . . ☐ DON'T KNOW/NOT SURE 8	→ 826
825	On a day when you eat fruits, how many servings do you eat on average? IF 'NONE' RECORD '0'	NUMBER OF SERVINGS . . . . . ☐ DON'T KNOW/NOT SURE 8	
826	In a typical week, on how many days do you eat vegetables, fo example carrots, cabbage, dark green leafy vegetables (e.g. kontomire), pumpkin, squash, etc? IF 'NONE' RECORD '0'	NUMBER OF DAYS . . . . . ☐ DON'T KNOW/NOT SURE 8	→ 900
827	On a day when you eat vegetables, how many servings do you ea on average? IF 'NONE' RECORD '0'	NUMBER OF SERVINGS . . . . . ☐ DON'T KNOW/NOT SURE 8	

SECTION 9 DOMESTIC VIOLENCE

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
900	CHECK HH Q.138 AND COVER PAGE OF MAN'S QUESTIONNAIRE MAN SELECTED FOR THIS SECTION ☐ MAN NOT SELECTED ☐ →		935
901	CHECK FOR PRESENCE OF OTHERS: DO NOT CONTINUE UNTIL EFFECTIVE PRIVACY IS ENSURED. PRIVACY OBTAINED . . . . . 1 PRIVACY NOT POSSIBLE . . . . . 2 →		934
	READ TO THE RESPONDENT Now I would like to ask you questions about some other important aspects of a man's life. I know that some of these questions are very personal. However, your answers are crucial for helping to understand the condition of men in Ghana. Let me assure you that your answers are completely confidential and will not be told to anyone, no one else will know that you were asked these questions, and no one else in this household is being asked these questions.		
902	CHECK 401 AND 402: CURRENTLY MARRIED/ LIVING WITH A WOMAN ☐ FORMERLY MARRIED/ LIVED WITH A WOMAN (READ N PAST TENSE) ☐ NEVER MARR ED/ NEVER LIVED WITH A WOMAN ☐ →		914
903	First, I am going to ask you about some situations which happen to some men. Please tell me if these apply to your relationship with your (last) wife/partner?		
	a) She (is/was) jealous or angry if you (talk/talked) to other women?	JEALOUS	YES 1 NO 2 DK 8
	b) She frequently (accuses/accused) you of being unfaithful?	ACCUSES	1 2 8
	c) She (does/did) not permit you to meet your male friends?	NOT MEET FRIENDS	1 2 8
	d) She (tries/tried) to limit your contact with your family?	NO FAM LY	1 2 8
	e) She (insists/insisted) on knowing where you are at all times?	WHERE YOU ARE	1 2 8
	f) She frequently (complains/complained) that you don't provide enough money?	MONEY	1 2 8
	g) She frequently (refuses/refused) to cook and (denies/denied) you food?	DENIES FOOD	1 2 8
	h) She frequently (refuses/refused) or (denies/denied) to have sexual intercourse with you when you want her to?	DENIES SEX	1 2 8
904	Now if you will permit me, I need to ask some more questions about your relationship with your (last) wife/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) wife/partner ever:	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) say or do something to humiliate you in front of others?	YES 1 → / NO 2 ↓	1 / 2 / 3
	b) threaten to hurt or harm you or someone close to you?	YES 1 → / NO 2 ↓	1 / 2 / 3
	c) insult you or make you feel bad about yourself?	YES 1 → / NO 2 ↓	1 / 2 / 3
	d) scream and shout at you?	YES 1 → / NO 2 ↓	1 / 2 / 3

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
905	A (Does/did) your (last) wife/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?	YES 1 →		1	2	3
		NO 2 ↓				
d)	punch you with her 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)	kicked or pulled your external genitalia?	YES 1 →		1	2	3
		NO 2 ↓				

906	CHECK 905A (a-h): AT LEAST ONE 'YES' ↓ ☐ NOT A SINGLE 'YES' ☐ →		909
907	How long after you first got married to/started living with your (last) wife/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	
908	Did the following ever happen as a result of what your (last) wife/partner did to you:		
	a) You had cuts, bruises or aches?	YES . . . . . 1 NO 2	
	b) You had eye injuries, sprains, dislocations, or burns?	YES . . . . . 1 NO 2	
	c) You had deep wounds, broken bones, broken teeth, or any other serious injury?	YES . . . . . 1 NO 2	
909	Have you ever hit, slapped, kicked, or done anything else to physically hurt your (last) wife/partner at times when she was not already beating or physically hurting you?	YES . . . . . 1 NO 2	→ 912
911	In the last 12 months, how often have you done this to your (last) wife/partner: often, only sometimes, or not at all?	OFTEN . . . . . 1 SOMET MES . . . . . 2 NOT AT ALL 3	

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
912	Does (did) your (last) wife/partner drink alcohol?	YES . . . . . 1 NO 2	→ 914
913	How often does (did) she get drunk: often, only sometimes, or never?	OFTEN. . . . . 1 SOMET ME! . . . . . 2 NEVER. 3	
914	CHECK 401 AND 402: EVER MARRIED/LIVED WITH A WOMAN → From the time you were 15 years old has anyone other than your (current/last) wife/partner hit, slapped, kicked, or done anything else to hurt you physically? NEVER MARR ED/ NEVER LIVED WITH A WOMAN → 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	→ 928
915	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 WIFE/PARTNER . . . . . F CURRENT GIRLFRIEND . . . . . G FORMER GIRLFRIEND . . . . . H MOTHER- N-LAW . . . . . I FATHER- N-LAW . . . . . J OTHER IN-LAW . . . . . K TEACHER . . . . . L EMPLOYER/SOMEONE AT WORK . . . M POLICE/SOLD ER . . . . . N MALE FR END . . . . . O STRANGER . . . . . P OTHER _____ X (SPECIFY)	
916	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 SOMET MES . . . . . 2 NOT AT ALL 3	
928	CHECK 905A (a-h) AND 914: AT LEAST ONE 'YES' NOT A SINGLE 'YES'		→ 932
929	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	→ 931
930	From whom have you sought help? Anyone else? RECORD ALL MENTIONED.	OWN FAM LY . . . . . A WIFE/PARTNER'S FAMILY . . . B CURRENT/LAST/LATE WIFE/PARTNER . . . . . C CURRENT/FORMER GIRLFRIEND . . . D MALE FR END . . . . . E FEMALE FR END . . . . . F NEIGHBOR . . . . . G RELIGIOUS LEADER . . . . . H DOCTOR/MEDICAL PERSONNEL . . . I POLICE . . . . . J LAWYER . . . . . K SOCIAL SERVICE ORGANIZATION . L COMMUNITYLEADER/LOCAL ADMN M OTHER _____ X (SPECIFY)	→ 932
931	Have you ever told any one else about this?	YES . . . . . 1 NO 2	

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
932	As far as you know, did your father ever beat your mother?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	
932A	As far as you know, did your mother ever beat your father?	YES . . . . . 1 NO . . . . . 2 DON'T KNOW 8	

THANK THE RESPONDENT FOR HIS COOPERATION AND REASSURE HIM ABOUT THE CONFIDENTIALITY OF HIS ANSWERS. F LL OUT THE QUESTIONS BELOW WITH REFERENCE TO THE DOMESTIC VIOLENCE MODULE ONLY.

			YES ONCE	YES, MORE THAN ONCE	NO
933	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?	W FE	1	2	3
		OTHER FEMALE ADULT . .	1	2	3
		MALE ADULT	1	2	3

934	INTERVIEWER'S COMMENTS / EXPLANATION FOR NOT COMPLETING THE DOMESTIC VIOLENCE MODULE	
935	RECORD THE TIME.	HOURS . . . . . ☐☐ M NUTES. . . . . ☐☐

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
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