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ETHNIC DISPARITIES IN PRENATAL CARE UTILIZATION IN VIETNAM

by

Ha Ngoc Trinh

A thesis submitted in partial fulfillment
of the requirements for the degree

of

MASTER OF SCIENCE

in

Sociology

Approved:

Michael Toney Major Professor	E. Helen Berry Committee Member
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UTAH STATE UNIVERSITY
Logan, Utah

2012

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ABSTRACT

Ethnic Disparities in Prenatal Care Utilization in Vietnam

by

Ha N. Trinh, Master of Science

Utah State University 2012

Major Professor: Dr. Michael B. Toney
Department: Sociology

Prenatal care is credited with reducing neonatal, perinatal, and maternal mortality and morbidity. The main purpose of the thesis is to examine the ethnic disparities between majority and ethnic minority women in prenatal care usage. The thesis also analyzes the effects of age, education attainment, female employment, and region on prenatal care utilization in Vietnam. I employ the Demographic and Health Survey 2002 in Vietnam. Descriptive statistic and logistic regression are the two statistical tests employed in this research. Results exhibit evidence of ethnic disparities in type of prenatal care utilization. Although ethnic minority women are likely to enter prenatal checkups at the same time as ethnic majority women, they are less likely to receive three or more prenatal checkups. Ethnic minority women are also less likely to receive prenatal checkups from professionals. When giving birth, minority women are less likely to deliver with a professional birth attendant, in a hospital or health facility. When controlling for other independent variables, education attainment and region show significant effects on prenatal care usage. Uneducated women, or women with less than secondary education, and women residing outside the Red River Delta consumed less professional prenatal care usage.

(114 pages)

PUBLIC ABSTRACT

Ethnic Disparities in Prenatal Care Utilization in Vietnam

by

Ha N. Trinh, Master of Science

Department of Sociology, Social Work, and Anthropology,
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2012

Prenatal care is known as medical care for pregnant women to reduce risks of adverse pregnancy outcomes and increase maternal and infant health. The World Health Organization (WHO) pays attention to prenatal care utilization in the developing countries for high rates of neonatal, perinatal, and maternal mortality and morbidity. Recently, Vietnam has shown improvement in prenatal care coverage. Although the government has put a lot of effort into implementing health care programs for pregnant women, Vietnam still experiences high neonatal and infant mortality rate. This fact brings up a question: Why, when implemented by the government, are prenatal care programs and behaviors ineffective in reducing the rate of neonatal and infant mortality?

Previous research on prenatal care usage in Vietnam has revealed ethnic disparity and stratifications between groups of women regarding ethnicities, provinces, geographic regions, religions, education attainments, women education, age, insurance coverage, distance to health facilities, cost effectiveness, and media exposure. In conjunction with research on prenatal care in Vietnam, other research on ethnic disparities report a growing gap between health care consumption between ethnic groups. Although these two bodies of research have mentioned prenatal care disparities between ethnic groups: Kinh/Viet and Hoa (ethnic majority), and the 53 other ethnicities (ethnic minority), none of them have provided a multivariate analysis on this health issue for the nation as a whole.

This thesis examines the ethnic disparities in prenatal care utilization between ethnic majority and ethnic minority women. Besides the main purpose, this thesis also examines the effects of other control variables (age, geographic regions, education attainment, and women employment) on prenatal care usage. This thesis used data from the Demographic and Health Survey 2002 to test five hypotheses. Findings from this thesis research suggest disparities between women of ethnic majority and minority in prenatal care utilization. Indeed, main findings reveal that minority women were: (1) only 45 percent as likely as majority women to have three or more prenatal care visits; (2) only 25 percent as likely as majority women to receive professional care; (3) only 18 percent as likely to have a professional birth attendant present when giving birth and (4) only 13 percent as likely as majority women to give birth in a hospital or other health facility. The hypothesis that minority women will be less likely than majority women to receive prenatal care in the first trimester was not supported. When controlled for age, education attainment, female employment and region, education attainment and regions have significant effects on prenatal care usage. Illiterate women and women residing in the Northern Uplands, Central Highland, and Central Coast reported significant lower odds than women with secondary and higher education, and women residing in the Red River Delta.

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I also want to thank the Demographic and Health Survey website for making the data available for public usage and for providing high quality data. Without public access offered by the website, it would have been difficult to collect data on my own, and it is unaffordable to purchase a large data set.

Lastly, I want to thank my wonderful family for always "being" with me. Despite the fact that my family resides thousands of mile away, I am still able to feel their love by innumerable emails, phone calls, and Skype video chats. I am grateful for having my father, who is a role model for me; for having my mother, who always insists that I quit graduate school to come home; for having my sister, who is always excited to hear my stories from being away from home. I also want to thank my "life-long partner" for supporting me by working and saving every penny for his woman's education, despite the context of a strong Confucian society.

Ha N. Trinh

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CHAPTER I

INTRODUCTION

World Health Organization's Prenatal Care Suggestions/Standards

Prenatal care first became a concern of public health in the late 1930s in Great Britain and quickly spread to other industrial countries (The World Health Organization [WHO], 2003). Prenatal care, also known as antenatal care, involves receiving prescribed medical and other care during pregnancy that is identified as increasing the health of pregnant women, and is credited with lowering fetal and infant mortality and leading to the birth of healthier babies. In 2007, the WHO published the Standards for Maternal and Neonatal Care, which offered suggestions for pregnant women to practice good health behavior during pregnancy. The suggestions were aimed at preventing, alleviating, and treating the health problems or diseases causing unfavorable outcomes of pregnancy. They also intended to provide women and their partners/families with adequate information on healthy pregnancy and emergency preparedness related to pregnancy.

These WHO standards defined the provision of prenatal care as: "All pregnant women should have at least four antenatal care assessments by or under the supervision of a skilled attendant. These should, as a minimum, include all the interventions outlined in the new WHO antenatal care model and be spaced at regular intervals throughout pregnancy, commencing as early as possible in the first trimester" (WHO, 2007, p. 1). In order to make prenatal care accessible to every woman, regardless of socioeconomic status, the WHO standards required: national and local policy in line with country epidemiological context, recruitment and deployment of sufficient skilled attendants, provision of necessary equipment and drugs for essential prenatal care, record of pregnancy history including individual cards detailing all action taken, treatment and advice, pregnancy test, plans for delivery, establishment of a skilled attendant network to cope with emergencies and

complications, and educational programs for pregnant women and their partners/families. To put these standards into action and to ensure accessibility for every woman regardless of place of residence, one noticeable requirement was notified by the WHO: “Skilled attendants and other health care providers offering antenatal care services” must provide health education for the community, offer a confidential and private environment to practice prenatal care, refer women with special need of prenatal care, and keep record on the maternal card (WHO, 2007, p. 2).

This thesis will examine disparities in the utilization of prenatal care as prescribed by the WHO for Vietnamese women regarding ethnicity, age, education, employment, and region. However, instead of using the “four visit model” suggested by the WHO, this thesis will adopt the “three visit model” consistent with the National Maternal Health Program suggested by the Vietnam Ministry of Health (VMOH) (2003). The main focus of the thesis will be to determine the extent to which ethnic disparities exist after controlling for other known social and demographic variables to be related to utilization of prenatal care. The utilization of prenatal care by ethnic minorities has been shown to be much lower than for members of ethnic majorities in many settings and Vietnam’s minority groups are noted for their unique socio-cultural place in Vietnam (Lieu, Dibley, & Byles, 2006; Målqvist, Nguyen, Wallin, Dinh, & Persson, 2010; Simkhada, Teijlingen, Porter, & Simkhada, 2007).

Disparities between groups based on age, educational attainment, employment, and region are also examined as they are introduced in multivariate analyzes. This research will differ from prior studies by utilizing multivariate statistical techniques that include this particular set of control variables (age, education attainment, employment, and region).

Disparities in Prenatal Care Utilization

Like other health services, prenatal care is sometimes not equally accessible for public usage. Paul and Singh (2004) noted a “regional factor” in prenatal health care consumption. Houweling, Ronsmans, Campbell, and Kunst (2007) showed evidence of “poor-rich inequalities” in maternal and infant care. In a comprehensive review of the literature, Say and Raine (2007), and Simkhada et al. (2007) found similarities in the influence of age, education, household income, female employment, availability and accessibility of prenatal care usage across a number of countries. Other factors which were significantly correlated with prenatal care were insurance coverage, quality and cost of services, history of obstetric complications, birth order, cultural beliefs and ideas about pregnancy, media exposure, and parity (Simkhada et al., 2007).

A large body of research has indicated the growing trend of prenatal usage and coverage, but still, little is known about the extent to which differences exist between minorities and majorities among Vietnamese women with respect to prenatal care. Lack of nationwide prenatal coverage and the inadequate usage of prenatal care by some groups may be a major cause of the high neonatal mortality rate in Vietnam when compared with other countries in the regions (WHO, 2006). Recent research on prenatal care has pointed out the inequity in prenatal care as one of the important areas of disparity in health services consumption.

Among the determinants of prenatal care disparities, ethnicity plays a significant role. Research on ethnic disparities in prenatal care has shown unequal access to prenatal care by ethnic minorities throughout the world (Malin & Gissler, 2009). Studies by Malin and Gissler (2009), and Choté et al. (2011) pointed out a disadvantage of ethnic minority women in obtaining prenatal care in developed countries. The same picture is seen in the developing world where ethnic minorities

are experiencing a higher risk of adverse pregnancy outcomes (Magadi, Madise, & Roddrigues, 2000; Say & Raine, 2007; Simkhada et al., 2007). Little is known about prenatal care usage in Vietnam (Lieu et al., 2006). However, some studies have suggested the existence of prenatal care disparities among ethnic minorities and majorities (Do, 2009; Lieu, Dibley, & Byles, 2007; Målqvist et al., 2010; Sepehri, Sarma, Simpson, & Moshiri, 2008). These studies of local areas in Vietnam found that ethnic minority pregnant women tended to enter prenatal care in later gestation age, had fewer pregnancy check-ups, lacked adequate vaccinations, preferred home delivery, and had traditional birth attendants during delivery. Research also shed light on the ethnic inequity of neonatal, perinatal, and maternal mortality prevalence among women of ethnic minorities in Vietnam (Målqvist, Sohel, Do, Eriksson, & Persson, 2011).

Although previous research has brought up the importance of studying ethnic disparities in prenatal care utilization in Vietnam, there are three major differences between previous research and the research proposed for this thesis. This thesis examines the disparities between the ethnic majorities and minorities in prenatal care utilization using the Demographic and Health Survey (DHS). The survey was conducted nationwide in Vietnam in 2002. The survey provided information on prenatal care of participants from 2000 to 2002. Prenatal care was measured by the number of prenatal checkups, the time of first prenatal checkup, care providers, place of delivery, and delivery attendants. The difference between this thesis research and the above research on prenatal care is the national coverage. All of the prior research mentioned above was conducted in some specific region/area or province/city in Vietnam. The DHS 2002 was conducted nationwide to represent the coverage of prenatal care and other issues in the country. Another difference is that each researcher set up a different cut-off point or created indices to measure prenatal care (Lieu et al., 2006; Tran et al., 2011). This thesis will create cut-off

points for each measurement distinguished with previous studies. Last but not least, this thesis analyzes the effects of ethnic disparities in prenatal care usage after controlling for other variables, namely, age, employment, education attainment, and region. A new path of studying regional disparities is introduced by dividing Vietnam into three categories: Upland, Center, and Lowland regarding the actual elevation combining with the distribution of ethnic groups. Variables will be entered step by step in logistic regression to search for changes in prenatal usage when new variables are introduced.

Ethnic Disparities in Vietnam

Vietnamese society is ethnically diverse (Baulch, Truong, Haugton, & Haughton, 2008). The lowland Vietnamese, also known as Kinh or Viet people, are the majority. They make up 85.72 % of the population of Vietnam (General Statistics Office [GSO], 2010). The rest of the population is composed of 53 ethnic minority groups. Studies of ethnic inequality in Vietnam generally group Kinh and Hoa (Chinese) into a group of the ethnic majority. The other 52 ethnic groups are defined as ethnic minority (Baulch et al., 2008). The remaining population after subtraction of Kinh and Hoa are the poorest and the least educated group of people in Vietnam. The Kinh and Hoa households have substantially higher living standards, as measured by per capita expenditures, than the ethnic minority households. The gap between ethnic minorities and majorities in Vietnam is also shown in the proportion of school enrollment, the fertility rate, and access to health services. In every aspect, the minority households reflect disadvantages when compared with the Kinh or Hoa households. Members of ethnic minority groups in Vietnam have a lower rate of school enrollment, higher fertility rate, and less health care services offered by professionals (Baulch et al., 2008). Ethnic minorities are more vulnerable to various

shocks, namely, natural disaster, and epidemiology, than ethnic majority (Imai, Gaiha, & Kang, 2011).

Certainly, ethnic minority subgroups differ from the majority groups in living standards, education attainment, and heath service accessibility. Ethnic minorities, also known as the “upland people,” mostly reside in two mountainous regions in Vietnam: the Northern Upland and the Central Highland. Comparisons between ethnic minorities in two geographic regions have shown a stratification of living standards and education attainment (Baulch et al., 2008). Ethnic minorities residing in the Northern Upland are somewhat better off than the ethnic minorities in the Central Upland. A similar stratification of living standards and education attainment is also found between ethnic minorities. Some of the ethnic minorities such as the Tay, Nung, and Muong resemble the Kinh or Hoa in some ways, they are better off than others such as the Hmong. Therefore, Hmong and the ethnic minorities in the Central Upland are left further behind than the majority and other ethnic minorities (Baulch et al., 2008). Imai et al. (2011) also found differences in poverty and expenditure among subgroups of ethnic minorities. Their findings match the findings of Baulch et al. (2008).

To explain the ethnic inequalities in Vietnam, some pathways have been developed. The first explanation of ethnic inequalities is the persistent geographic inequalities (Walle & Gunewardena, 2001). Ethnic minorities reside in “less productive areas, with difficult terrain, poor infrastructure, and lower accessibility to the market economy and off-farm work” (Walle & Gunewardena, 2001, p. 203). Nonetheless, the most agreeable explanation of ethnic disparities is not the geographic inequalities. Walle and Gunewardena (2001), Baulch et al. (2008), and Imai et al. (2011) agreed on the explanation of the ethnic disparities. Ethnic inequalities are not only created by the remote location, but also the endowment. Ethnic minorities lack endowments and both the physical and human capital to

achieve success in education and living standards. They may also have low returns on what endowment they do have based on social discrimination, cultural differences, inadequate information, and remoteness.

Significance of the Study

The evidence found in the body of research points to the importance of analyzing prenatal care in the national context. Many countries at the same level of development and located in the same geographic regions as Vietnam have shown a higher level of prenatal care coverage, better quality of prenatal care services, and greater reductions in maternal and neonatal mortality (WHO, 2006). This thesis differs from other studies by examining ethnic disparities in the national context of Vietnam and the use of multivariate models to better understand prenatal care utilization.

The literature review suggests a need for filling the gap of public health knowledge on prenatal care in Vietnam. Although many researchers have conducted studies of prenatal care of the larger geographic region in which Vietnam is located, little is known about the prenatal care for the national context of Vietnam. Prenatal care research within Vietnam has been mostly conducted in one socio-geographic area (Lieu et al., 2007; Målqvist et al., 2011; Tran et al., 2011). Others only cover one aspect of prenatal care without being concerned with other aspects (Do, 2009; Målqvist et al., 2010). Also, little is known about the extent to which disparities between socio-demographic groups of pregnant women exist in different regions of Vietnam. Research that focuses on differences between socioeconomic groups of women in Vietnam is also needed, along with analysis of differences between ethnic groups. Providing better knowledge on ethnic disparities in prenatal care in particular and health disparity in general is one of the significant goals of this study. Other than that, understanding the ethnic inequalities in prenatal care can make it possible to

build a better intervention model in future research. Also, an investigation of the effects of age, education attainment, employment, and region in a multivariate analysis will increase the understanding of prenatal care in Vietnam.

Research Purposes

The main purpose of this thesis is to examine the disparities in prenatal care between the ethnic majority (Viet/Kinh) and ethnic minorities (other ethnicities) in Vietnam using the Demographic and Health Survey (DHS) 2002. The thesis also examines the effects of other independent variables on prenatal care. Other independent variables are age, education attainment, employment, and region.

Hypotheses

The overall hypothesis for this thesis research is that: Ethnic minority women will be less likely than majority women in Vietnam to receive the appropriate level and kinds of prenatal care. Five measures of prenatal care are employed in the analysis in order to provide a rigorous examination of the effects of ethnicity and the five control variables. The five dependent variables will be used with logistic regression to test five sub-hypotheses related to the overall hypothesis. Accordingly, the following five sub-hypotheses are tested:

Hypothesis One: Minority women will be less likely than majority women to receive prenatal care in the first trimester.

Hypothesis Two: Minority women will be less likely than majority women to receive three or more prenatal checkups.

Hypothesis Three: Minority women will be less likely than majority women to receive prenatal care from professional caregivers.

Hypothesis Four: Minority women will be less likely than majority women to have a professional birth attendant present when giving birth.

Hypothesis Five: Minority women will be less likely than majority women to have their births in a hospital or health facility.

CHAPTER II

LITERATURE REVIEW

In this section, the literature on prenatal health practices will be reviewed. Before reviewing the literature on prenatal care practices, the key concept of prenatal care is introduced. After the key concept of prenatal care utilization and ethnic disparities are defined, this chapter will be expanded by reviewing the literature on ethnic disparities in prenatal care usage in the world and in Vietnam. Other studies involving socio-demographic variables in association with prenatal care utilization will be reviewed under each section. All variables found significantly associated with prenatal care utilization in prior research will be discussed. However, variables that are employed in this thesis research will be treated with more attention.

Key Concepts

The first main concept of this study is prenatal care. Sometimes prenatal and delivery care are separated into two distinct concepts (Stanton, Blanch, Croft, & Choi, 2006; WHO, 2006). The WHO defines prenatal care (also called antenatal care) as services given to pregnant women by health professionals (WHO, 2006). Prenatal care is composed of recording medical history, giving assessment of individual needs, giving advice and guidance on pregnancy and delivery. It also includes screening tests, educating self-care during pregnancy, identifying conditions detrimental to pregnancy health, first-line management, and referral if necessary (WHO, 2006). It is obvious that prenatal care suggested by the WHO consists of services and education for pregnant women. However, in most studies on prenatal care, researchers defined prenatal care as health care services provided by professionals at a health center. They ignored the education purpose of prenatal care (Graner, Mogren, Le, Krantz, & Klingbert-Alvin, 2010; Lieu et al., 2006, 2007; Tran et

al., 2011). Researchers also developed their own measurements of prenatal care in prior research. The following section will explain more.

To promote a better understanding of the importance of having a universal approach to maternal and infant health, the WHO published the Standards for Maternal and Neonatal Care in 2007. This publication suggests health practices for pregnant women to minimize the adverse outcomes of delivery and infant health. The WHO prenatal health recommendations include: prevention and management of sexually transmitted and reproductive tract infections, prevention of mother-to-child transmission of syphilis, prevention of congenital rubella syndrome, prevention of neural tube defects, provision of effective prenatal care, malaria prevention and treatment, iron folate supplementation, birth and emergency preparedness in prenatal care, and maternal immunization against tetanus (WHO, 2007). The standard of prenatal care by the WHO indicated that pregnant women should have at least four prenatal care check-ups provided by skilled attendants. The intervals between each visit should be spaced evenly throughout pregnancy. However, in this thesis, the number of visits considered as meeting the standard of professional prenatal care is three, one for each trimester as suggested by the VMOH (2003).

The second key concept is ethnic disparity. Before introducing this concept, race and ethnicity are shortly defined. Race and ethnicity are often used interchangeably. While race is viewed as the identity based on ancestry and color, ethnicity is defined from ancestry (Lee & Bean, 2004). Lee and Bean (2004) also suggested that race/ethnicity is a term involving more social and cultural than biological. Classic understanding of race/ethnicity only accepted a “straight-line model” of blacks and whites. Among blacks and whites, blacks were considered as the “racial groups.” Recently, immigration and intermarriage in the United States have failed the “straight-line model” and have blurred the color boundaries. The new context of increasing immigrants and intermarriage in America has increased the

multiracial population. Therefore, the term race/ethnicity is no longer a fixed concept, but has become more dynamic (Lee & Bean, 2004).

Despite the fact that racial/ethnic boundaries are being eliminated by the assimilation of immigrants, racial/ethnic disparities still persist, especially in health status, health outcomes, and health care consumption. Racial/ethnic disparities have been well-studied. Racial/ethnic disparities in health were described as disproportionate in prevalence of health status and health outcomes (Betancourt, Green, Carrillo, & Ananeh-Firempong, 2003). Results mostly suggested poorer health status and less accessible health care services for racial/ethnic minorities. Prevalence of cardiovascular disease, obesity, diabetes, asthma, cancer, HIV/AIDS, and other diseases and illness were found in racial/ethnic minority groups. Reasons for racial/ethnic disparities were suggested by many researchers. Racial/ethnic minority members were likely to experience economic disadvantages, higher rates of hazardous occupations (Betancourt et al., 2003), unsafe neighborhoods, exposure to high calories, low nutrient food (Kumanyika & Grier, 2006), social assault (both verbal and physical attacks), psychological distress, racism (Karlsen & Nazroo, 2002), no or less insurance coverage (Hargraves & Hadley, 2003), a high rate of emergency department usage, and late-entry of serious illnesses (Betancourt et. al., 2003; Van Ryn & Fu, 2003). Such findings have firmly supported the existence of racial/ethnic disparities in health.

Ethnic Disparities in Prenatal Care Utilization in the World

Ethnic Disparities in Prenatal Care Utilization

Simkhada et al. (2007) reviewed 28 qualified studies on prenatal care utilization in developing countries. Their study found seven groups of factors affecting the usage of maternal and infant health care services. They were: Socio-demographic factors, availability, accessibility, affordability, health service

characteristics, position of women in the household and the society, and women's knowledge, attitudes, beliefs, and the culture they are living in. Among these factors, some had stronger impacts than others. Woman's education, husband's education, parity, birth order or interval, intended pregnancy, age of woman at marriage or pregnancy, marital status, ethnicity/caste/religion, family size and structure were listed as socio-demographic factors. Those seven factors were found significantly correlated with prenatal care usage in the developing countries. Woman's education was the most influential determinant, followed by parity. Ethnicity/caste/religion was the third important factor, and was found to be close with the age of the woman at marriage and pregnancy. Fewer studies stressed the importance of husband's education, marital status, intend pregnancy, and birth order or interval. Availability of service was not influential. Accessibility is a more controlling factor. Accessibility is defined as place of residence and distance or travel time to health facilities. Between the two components, place of residence had a stronger effect on the usage of prenatal care. Affordability is composed of women occupation/employment, socio-economic status/standard of living, husband occupation, and cost of the services. Cost of services and husband occupation were not as important as socio-economic status/standard of living and women occupation/employment. Characteristics of health services only included insurance coverage, and it did not have much significant effect. Women's status in the household was composed of the women's status and autonomy, friends, family, and social support. Women's status/autonomy was more essential. The last theme consisted of media exposure, history of obstetric problems, knowledge of family planning, prenatal care (diet, danger signs), and personal hygiene. Knowledge of family planning was rated the highest, followed by the history of obstetric problems. This review of both qualitative and quantitative studies has brought up a general understanding of maternal health behaviors in the developing countries.

Choté et al. (2011) sought an explanation for ethnic differences in late prenatal care entry in Netherlands. They looked at Dutch and non-Dutch women's entrance to prenatal care provided by community midwives. The differences between the two groups can be explained by need, and predisposed and enabling factors. 2,093 pregnant women of Dutch, Moroccan, Turkish, Cape Verdean, Antillean, Surinamese Creole, and Surinamese Hindustani background were selected. Late entrance to prenatal care was defined as beginning to visit a health center after 14 weeks of gestation. The findings suggested that non-Dutch women, except Surinamese-Hindustani, were more likely to enter prenatal care later than Dutch women. Consequently, later receipt of prenatal care reduced the opportunity of being advised about good health practice or benefitting from suggestions to avoid complications of non-Dutch women, excluding Surinamese-Hindustani. Some behavioral factors were also included in the study. Women with less tobacco use and alcohol consumption entered prenatal care earlier than others. Women who never used folic acid also entered late. Educational level also showed a significant influence on the timing of the first prenatal check-up. Women with a higher level of education had pregnancy check-ups earlier. Non-Dutch women with Asian and African backgrounds were one of the determinants. Asian background had no significant difference in timing for first visit when compared with Dutch, while African background was very distinguished.

Carolan (2010) followed a group of sub-Saharan women who had migrated to developed countries as refugees. A systematic review of the literature was conducted to examine the pregnancy health status of African refugees after resettling in a developed world. They were among a group at risk of pregnancy with little care access. Poor prior health, co-existing disease, and traditional cultural practices were the determinants of high risk pregnancy. Infant mortality and morbidity were analyzed

as possible pregnancy outcomes and were found comparatively high in the sub-Saharan refugee population in the developed countries.

Other Determinants of Prenatal Care Utilization

UNICEF, United Nation Population Division, WHO, and World Bank (WB) (2010, 2011) identified the geographic differences in prenatal care usages. Collecting data from at least four data sets representing the coverage of prenatal care in different countries, UNICEF et al. (2010, 2011) compiled a list showing the percentage of women aged 15-49 years who had at least one prenatal check-up by professionals. In some countries, 100% of the pregnant women had at least one prenatal visit. Some of those are: Australia, Austria, Barbados, Brunei, Dominica, Finland, Grenada, Kazakhstan, Oman, etc. Most of them are located in the developed parts of the world. Many countries had less than 50% of women attending at least one pregnancy visit, for example, Afghanistan (16%), Chad (39%), Ethiopia (28%), Laos (35%), Nepal (44%), Niger (46%), and Yemen (47%). All of them are listed in the developing parts of the world (UNICEF et al., 2010, 2011). UNICEF's sources of information on prenatal care can be found in the Millenium Development Goals (MDG) report. According to the MDG's data from 1990 to 2008, the coverage of skilled birth attendants in developing countries rose from 54% in 1990 to 63% in 2008. When compared with those of the developed countries, the coverage percentages of the developing countries were much smaller. The percentage in 1990 was 93% and rose up to 97% in 2008 in the developed countries. In 2008, broken by geographic regions, European countries had the highest percentage of skilled birth attendance (97%), while in South Asia, it was only 43%. Broken by geographic regions and wealth quintiles, the East Asia and the Pacific, excluding China, remained equal between five wealth quintiles. 54% of the poorest poor and 91% of the richest rich received professional delivery assistance. On the other hand, South Asia showed a disparity in professional delivery consumption. Only 17% of the

poorest poor can achieve it, while 83% of the richest rich had a doctor, nurse or midwife take care of their delivery (UNICEF et al., 2010, 2011).

Ribeiro et al. (2009) identified risk factors for inadequacy of prenatal care utilization in a metropolitan Northeast Brazil area. Brazil has a wide coverage of prenatal care with a high percentage of women participating in prenatal care by professional caregivers. However, high rates of perinatal and neonatal mortality and morbidity remained. The negative outcomes of good prenatal health practices raised a discussion on the quality of prenatal care provided by caregivers. Results indicated that a significant proportion of women did not receive full care during pregnancy. The explanation was found from the growing socioeconomic inequalities, demographic factors, and behavior risk factors. A large number of adolescent pregnancy found in this area contributed to inadequate prenatal care. Public care seekers also had a higher rate of inadequate use. Women less than 35 years of age who had a low education level, low household income, two or more children, cohabitated with partners, or smoked initiated prenatal care later.

In 2003, WHO carried out a worldwide research using recent DHS data for many countries. The research aimed to study the use of prenatal care all over the world from 1990 to 2001. Basic information was gathered and informed the utilization of prenatal health practices in the world. According to the results, most women had some prenatal care. Excluding Sub-Saharan Africa, most women sought prenatal care in early gestation. Most of the women having prenatal care reported four or more visits. Among them, the proportion of urban women was twice the proportion of rural women. Except Sub-Saharan Africa, educated women had more visits than uneducated or less educated women. The WHO found insignificant differences between age and parity groups, but it was significantly influenced by wealth. Prenatal care was provided by trained health care workers. Due to the limitation of

interventions collected in the DHS, the WHO acknowledged the importance of having a fully developed theme to study prenatal care.

Besides the WHO, many researchers from different countries paid attention to prenatal care in the developing countries. Along with the interventions for better maternal care, having a skilled birth attendants contributed to the successful live birth. Stanton et al. (2006) used various data sets available in each country from 1990 to 2000. Results showed preference with the study by the WHO in 2003. Even so, Stanton et al. identified more specific information on skilled birth attendants. Women aged from 15 to 29 had higher rates of seeking professional birth attendants than those aged 35 and above. First births were the most likely to receive skilled assistance during delivery.

Say and Raine (2007) also conducted a review literature on prenatal care practices. Their findings were somewhat similar to Simkhada et al. (2007), although less variables were taken into consideration. They saw a great variation between and within countries. Each country experienced an urban-rural and wealth disparity. Urban and wealthier women tended to deliver with skilled birth assistants, while rural and less wealthy women were less likely to seek the help of professionals. However, poor-rich and urban-rural disparities varied between countries. Wealthy women in some countries preferred delivery in medical centers. Wealthy women in other countries did not. Some evidence suggested wealthy women sought prenatal care earlier than the poor. In contrast to Simkhada et al., Say and Raine (2007) rejected the importance of place of residence in collaboration with increasing prenatal care. Researchers using DHS were able to predict the determinants of prenatal health care in the developing countries. Houweling et al. (2007) selected DHS for 45 developing countries, from 1990 to 1998. They discussed the inequalities of maternal health care. They found that inequalities in professional delivery care were greater than any other forms of care included in the research (professional delivery attendance,

prenatal care, immunization, treatment for diarrhea, and acute respiratory infections). Although population living in the urban area was too small when compared with rural residence in the developing countries, rural area was burdened with the lack of professional delivery care. The study even saw a huge gap between the rich rural dwellers and the poor city citizens in delivery care. Another factor affecting prenatal and delivery care was the unmet demands and the failure of public sectors in indentifying poor-rich inequalities. Consequently, inequalities in this form of health treatment were larger over the period of development.

Ethnic Disparities in Prenatal Care Utilization in Vietnam

Ethnic Disparities in Prenatal Care Utilization

Do (2009) used the DHS 2002, which is the same data to be employed in this thesis research. Do (2009) acknowledged the importance of having professional attendants during delivery. He compared the utilization of skilled birth attendants between public and private sectors. The use of delivery care increased in the DHS 2002 when compared with the previous one in 1999. The majority of births between 1999 and 2002 were attended by skilled providers. Most of the women gave birth in public hospital/health facilities. The author explained that many rural areas do not have private hospital/health facilities, or, if there is one, the quality is unable to compete with public sector services. Education, household wealth, and belonging to the Kinh majority ethnic were the significant determinants of whether they chose skilled birth attendants. Among these three factors, education was the most significant. This finding was consistent with other findings about women education and their autonomy and ability to make a decision related to health issues. Both education and household wealth were determinants of having a professional birth attendant from the private hospital/health facility. However, it is still true that if the women are poor and less educated, they still chose the private sector. Private factor

chosen by poor and less educated women is explained by the fact that the public health sector is unavailable in the area. Another finding is that the more children the women had, the more likely it was that they had low skilled attendants. The higher the birth order is, the less likely they were attended by professional health workers. Women seem to be more cautious with the first birth, and less cautious when they have more children. The findings from Do's research are consistent with other research on utilization of delivery care in the world.

Ethnic inequality in neonatal care has been introduced in a case study in a province located in Northern Vietnam. Målqvist et al. (2011) chose Quang Ninh province in which to conduct the Neonatal Knowledge Into Practices project. They recorded all births between July 2008 and December 2009. All live birth contacts were collected to conduct a monthly interview. Well-trained data collectors contacted the mothers who had given birth four to eight weeks after delivery to find out if the newborn was still alive or if it had died. The neonatal mortality rate was 17/1000, with 197 neonatal deaths. They concluded that a significant association between ethnicity and neonatal survival existed in this province. Although education attainment and household wealth status are large factors, being an ethnic minority mother doubled the risk of neonatal death. When adjusted for health care utilization during pregnancy and delivery, the risk of neonatal mortality is five times higher for women of ethnic minorities. It is consistent with their previous study in Bavi. Women of ethnic minority groups there were more reluctant to utilize prenatal care. They were less likely to deliver at a health facility. They sought help from traditional attendants instead of having check-ups and delivery at a communal or higher level health facility. A low level of education attainment was found to significantly correlate with being an ethnic minority. When these two factors combined, they predicted the neonatal mortality. Household wealth index was another factor chosen to predict chances of prenatal survival, but it was insignificant.

Distance to a health care facility was also considered as a potential cause of prenatal and neonatal health improvements. Although this thesis did not take distance to a health facility into consideration, it is still worth reviewing how distance to health facilities impacts the quality of delivery utilization and neonatal mortality, since ethnic groups often live farther away from health care facilities than members of the majority. Another research of Målqvist et al. (2010) used the same data collected in Quang Ninh province, but focused on the connection between distance and delivery care in association with neonatal mortality. They calculated the distances from respondents' houses to the closest community health center, district hospital, or tertiary hospital. Mothers of low socio-economic status were widely found in remote and mountainous areas. When education level and wealth index are set aside, distance to the nearest health centers impacted the choice of where to deliver. This study found out that the women who delivered at home lived far away from the health facilities. They lived further than women who chose to deliver at any level of health center. Linking with the postnatal health risk of home delivery, distance was significantly correlated.

A different angle to look at prenatal care in Vietnam is analysing the individual, household, and commune characteristics as the impacts on prenatal utilization. A study of Sepehri et al. (2008) provided the knowledge of community effects on individual choices of whether to have prenatal care and whether to choose a health center to give birth. They used the data from the National Household Survey 2002, a large scale survey, to represent the prenatal health practices in Vietnam. The study proposed a modeling framework to better understand the prenatal health practices of Vietnamese women. The decision of the delivery place was jointly determined by the individual, household, and community characteristics. On the other hand, prenatal utilization depended on a single level of individual, household, or community. First, a prenatal visit was influenced by whether or not the woman had

health insurance. Having health insurance increased the number of prenatal visits, while it did not affect the choice of seeking care. Middle and higher income women with insurance tended to deliver in a health facility, while it did not show effect for lower income group. A woman's choice for seeking prenatal care was affected by the observed household, and the community characteristics, such as income and ethnicity, geographic area, poverty rate, and distance to the closest health facility. In contrast, the women's choice of place to give birth depended on unobserved community characteristics including quality of health facilities. These findings were useful for policy-makers to generate a multi-level approach to enhance prenatal care in Vietnam.

Other Determinants of Prenatal Care Utilization

Graner et al. (2010) approached prenatal health provision and use in Vietnam in a qualitative descriptive study. Unlike other studies, this study was designed to explore the prenatal health practices from the perspectives of professional health workers including midwives, assistant physicians, and medical doctors. Graner et al. collected information from a homogenous group of health workers, including 21 midwives, six assistant physicians, and two medical doctors from the community health stations. They chose Bavi, a mountainous district of Hanoi, where farming and livestock breeding are the main source of income. The most important finding pointed out the restrictions of prenatal care in a rural district of Vietnam. The recent dramatic changes of Vietnam seemed to have increased inequalities in health care consumption. Insurance gave benefits to those who were employed by the government or commercial companies, and those who lived under the poverty line. Most of the women in Bavi are self-employed. Economical constraint prevents them from consuming prenatal care. If they face complications or any obstetrical emergency, economical context is one of the barriers stopping them from receiving better services.

Lieu et al. (2006) claimed their study in 1999 to be the first study in Vietnam that reflected the big picture of prenatal care. They proposed a set of indicators and indices to measure the prenatal adequacy levels. They chose three provinces: Long An, Ben Tre, and Quang Ngai. Two provinces are located in the Mekong Delta, the most developed region in the country. Quang Ngai belongs to the Center Coast, which is among the least developed regions. They included thirteen items in the survey. Excluding some bio-medical assessments, items about prenatal care were listed: care provision (tetanus toxoid immunization, iron/folate supplement, malaria prevention, safe delivery preparation), and health promotion/education (nutrition and resting). They added cut-off points for some questions instead of "Yes" and "No." For example, the number of prenatal visits was recoded into "Enough," "Intermediate," "Not enough," "Missing," and "No care." Results certified low but increasing prenatal health in Vietnam. Prenatal care did not meet the suggestions of the Vietnamese government because not all women received prenatal health service. Each geographic region developed a list of suggestions for pregnant women. None of the provinces in the study had adequate prenatal care suggested by the province. When compared with other developing countries, 72%, of women who had prenatal care entered the care early during their pregnancy. Because the research used the cut-off point of one visit in each trimester, the number of women who had more than four prenatal visits was far lower than other developing countries (11%). Another similarity with other developing countries is more clinical assessments were used than laboratory tests.

Continuing the study on prenatal care utilization in three rural provinces in Vietnam, Lieu et al. (2007) sought the determinants of the prenatal care usage. Findings shared similarities with previous studies and corresponded with the Andersen Model of Health Seeking Behavior (Andersen, 1995). They identified the determinants of prenatal usage in three rural provinces: Quang Ngai, Ben Tre, and

Long An. Women in Quang Ngai were less likely to achieve prenatal health care than women in two other provinces because of their lower economic status. Women with less prenatal health usage had less education attainment, worked outside of the house, and belonged to ethnic minorities. They were also poorer and had no health insurance. They usually had three or more children. They continued heavy physical activities close to the day of delivery. They did not consume iron or folate tablets. Lastly, they never used contraception. Moreover, the findings clarified women who sought prenatal in early gestation tended to have more time for other pregnancy visits.

Rural and urban disparity was also important in studying prenatal care utilization. Tran et al. (2011) concluded the disadvantages of rural women seeking prenatal care. They chose two cohorts of pregnant women in one urban and one rural district of Hanoi, the capital of Vietnam. The first study was conducted in Bavi in 1999. In 2007, the second study was launched in Dong Da district. Since the author chose Hanoi, all the information on prenatal care reflected the higher proportion of prenatal care utilization. Close to 100% of participants received prenatal care, much higher than the national recommendations of prenatal health care. It was also higher than many other developing countries. It showed an increasing trend when compared with studies in the past. The study showed the disparity between rural and urban women. Urban women had more pregnancy visits and used more services than rural women. Looking at the timing for the first visit, a wider gap was found between urban and rural women. Urban women tended to have their first visits during the first trimester, while rural women waited longer. This study even concerned the “six core services” including: fetal examination, body weight and height measurement, urine test, blood pressure assessment, tetanus vaccination, and health consultation. They found a large number of women in the rural district did not receive the six core services, unlike urban women. Urban women sought prenatal health services in

public or private hospitals. Rural women only came to local health facilities or clinics which were lacking equipment and human resources. As a central district of Hanoi, a density of public and private hospital was found in Dong Da, while in Bavi, going to a district hospital is one of the constraints to fully receive prenatal health services. The results of this study yield the same conclusions with other studies in urban-rural disparity in prenatal health practice. They suggested a better approach to communities of different developmental levels.

Following the prenatal health guidelines in 2007, the WHO has conducted a survey on maternal and perinatal health in 2010 (Lumbiganon et al., 2010). It was conducted in three regions: Africa, Latin America, and Asia. The purpose of this survey was to estimate the rates of delivery methods and to examine the relations between the delivery methods and the outcomes of maternal and infant health. Nine countries in Asia were chosen to represent the regions. They are: Cambodia, China, India, Japan, Nepal, Philippines, Sri Lanka, Thailand, and Vietnam. In each country, the capital and two other provinces were randomly selected. Women who agree to have a cesarean section without medical indication suggested by professionals/doctors are exposed to higher risks of maternal mortality and severe morbidity. They are more likely to be admitted to an intensive care unit after delivery. Infants born to mothers who have a cesarean section without medical care are also impacted by the cesarean section. The perinatal mortality rate for infants born in caesarean is significantly higher than infants born by spontaneous vaginal delivery (WHO, 2010, p. 6). The findings yielded similar results with the previous survey in other regions. Based on the findings in three maternal and perinatal health survey, the WHO has made recommendation not to use cesarean sections if they are not medically prescribed.

Graner et al. (2010) found another constraint to prenatal care in a group of women who were expecting their third child. The Confucian perspectives still impact

the boy preference in Vietnam, especially in the rural areas. Most of the women who are having their third child have already had two daughters. Couples who violate the two child policy of Vietnam end up with a fine. Fear of paying a fine or any other punishments from the community makes them unable to reach prenatal care. Other findings are about improving the maternal health care in community health stations. Most participants stressed the inadequate resources, both human resources and equipment. Heads of community health stations reported the need for raising funding for health facilities at the communal level. To meet the needs of clients seeking for better quality of health care provided at the community health stations, participants suggested continuous training programs for health care providers. However, no suggestion on improving interaction with clients was made. Mountainous women prefer delivering in a community health station because of the cost of higher quality medical care and the longer transportation. However, the communal health sections can't deal with complications. In case of emergency, they expect the women to follow their medical advice and move up to a higher level of health facilities. To meet a higher quality of prenatal health, the professionals indicated the roles of prenatal care education for both women and men, especially for those who reside in the remote areas.

In conclusion, prior research has prepared good background information in studying prenatal care utilization. They have described a disproportionate amount of prenatal care usage between ethnic groups all over the world. In most studies, women of ethnic minority groups reported having less prenatal care usage when compared with ethnic majority women. The same patterns were obtained for Vietnamese women. Women of ethnic minority were less likely to practice good prenatal care during pregnancy and delivery when compared with ethnic majority women. Moreover, prior research suggested explanations for such disparities. Many studies found significant effects of ethnic identity, regions, rural-urban, education

attainment, parity, age, marital status, cast, religion, occupation, and family size and structure on women's decisions on prenatal care utilization. Other determinants, leave the same availability, accessibility, affordability, health service characteristics, women's position in the household and the society, women's knowledge, attitudes, beliefs, and culture were also found to correlate with prenatal care usage. In Vietnam, no research has employed all the above variables in studying prenatal care usage. Researchers mostly inquired about socio-demographic factors and quality of care in prenatal care utilization research. However, findings from prior research in Vietnam have not described a national trend in prenatal care disparities between two ethnicities. Furthermore, each research occupied distinctive set of measurements. Some examined contents of prenatal care visits. Others acknowledged the importance of prenatal care during delivery. Understanding the need for a national study of ethnic disparities in prenatal care usage and a composition of prenatal care measurements, this thesis will compare five contents of prenatal care during pregnancy and delivery practiced by ethnic minority and majority women in Vietnam.

CHAPTER III

DATA AND METHODS

This section discusses the data and methods used in this thesis. Following the introduction of data, the measurement of variables is included. The last part of this section deals with the statistical techniques.

Data

The thesis uses the Demographic Health Survey, referred to as DHS, conducted in Vietnam in 2002. The Monitoring and Evaluation to Assess and Use Results Demographic and Health Surveys (MEASURE DHS) project is funded by the U.S. Agency for International Development, participating countries and other donors. The surveys are implemented by the Inner City Fund (known as ICF) International and other internationally experienced organizations to build a better understanding about health issues in developing countries. The DHS have been conducted in many different countries throughout the world. They have provided data for many research projects and are meant to provide data for detailed analysis of issues pertaining to a particular country and for studies that compare countries to one another. DHS are nationally representative household surveys that collect a wide range of information. They usually provide data on the following topics: anemia, child health, domestic violence, education, environmental health, family planning, female genital cutting, fertility and fertility preferences, gender/domestic violence, HIV/AIDS knowledge, attitudes, and behaviors, HIV prevalence, household and respondent characteristic, infant and child mortality, malaria, maternal health, maternal mortality, nutrition, tobacco use, wealth, women's employment, and other topics are sometimes examined in special modules . There are two types of surveys designed in DHS: Standard and Interim. The Standard DHS involves a large sample size (between

5,000 to 30,000 nationwide households). They are conducted every five years to allow comparisons over periods of time. The Interim DHS, on the other hand, has a much smaller sample size. They focus on one module, for example, maternal health, or infant mortality. They use a shorter questionnaire than the Standard survey. This thesis utilizes the 2002 Standard DHS.

In Vietnam, the DHS were carried out in two phases: Vietnam 1997 as DHS-III, and Vietnam 2002 as DHS-IV. Both phases were implemented by the Vietnam General Statistics Office and the DHS research team. Following the DHS 1997, the DHS 2002 consisted of 205 random enumeration areas spread throughout 53 provinces or cities in Vietnam. The data were collected from October to December 2002. To maintain the representative data, the DHS 2002 were designed to fit with other surveys by the GSO and other organizations, for example, WB.

The 2002 Standard DHS in Vietnam included 7,048 households and 205 facilities. Three types of questionnaires were used in DHS 2002. Two of the questionnaires, the Household Questionnaire and the Individual Women's Questionnaire were based on the DHS Model A Questionnaire. The last one, the Community/Health Facility, was used to collect information on all communal health centers. Those communes were the place where all the women who took part in the Individual Women's Survey lived.

This thesis utilizes the Individual Women's Questionnaire. Married women at the reproductive age from 15 to 49 years old in the surveyed household were asked to take part in the Individual Women's Questionnaire. The purpose of the Individual Survey was to investigate the following topics: Respondent's background, reproductive history, contraceptive knowledge and use, prenatal and delivery care, infant feeding practices, child immunization, fertility preferences and attitudes about family planning, husband's background, women's work information, and knowledge of AIDS. The survey gathered data from 5,706 eligible women, who were married

and at an age between 15 and 49. There were 5,665 women successfully interviewed. In the period of 1999 to 2002, there were 4,444 women who experienced no birth. This thesis only analyzes the most current single births in order to obtain consistency. Therefore, this thesis only examines prenatal care utilization of 1,221 women who had single births and 96 women who had more than one single birth). For the 96 women who had more than one pregnancy in three years, prenatal care was accessed, and information for the most recent birth will be analyzed. The 4,444 women who did not give birth between 1999 and 2002 were excluded from the analysis.

Measurements

This part discusses the dependent, control, and independent variables used in this thesis.

Dependent Variables

Five dependent variables are used in this thesis. They are derived from a series of questions about prenatal care and delivery care. The questions on prenatal care were: “When you were pregnant with [Name of child], did you see anyone for prenatal care for this pregnancy?,” “If Yes, whom did you see? Anyone else?,” “How many months pregnant were you when you first received prenatal care?,” “How many times did you receive prenatal care during this pregnancy?.” The questions on delivery care were: “Where did you give birth to [Name of child]?,” “Who assisted with the delivery of [Name of child]? Anyone else?,” To meet the analysis criteria, all dependent variables are recoded into dichotomous variables as shown in Table 3.1. In order to run logistic regression in Statistical Package for Social Sciences (SPSS), all the categories referring to better practice of prenatal care are coded as “0”. In contrast, categories without good prenatal care practice are coded as “1”.

Table 3.1

Original and Recoding of the Five Dependent Variables

Original Questions	Recoded Variables/Hypotheses
"How many months pregnant were you when you first received prenatal care?" Months Don't know (98)	Reporting first prenatal visit at first trimester: First trimester (0), Not first trimester (1) Hypothesis One
"How many times did you receive prenatal care during this pregnancy?" Number of times Don't know (98)	Reporting having three or more prenatal visits: Three or more (0), Not three or more (1) Hypothesis Two
"When you were pregnant with [Name of child], did you see anyone for prenatal care for this pregnancy?", "If Yes, whom did you see? Anyone else?" Health professional: Doctor (a), Doctor's assistant (b), Midwife (c), Nurse (d) Other person: Traditional birth attendant (e) Others (Specify) (x) No one (y)	Reporting having professional care providers: (doctor, doctor's assistant, midwife, nurse): Yes (0), No (1) Hypothesis Three
"Who assisted with the delivery of [Name of child]? Anyone else?" Health professional: Doctor (a), Doctor's assistant (b), Midwife (c), Nurse (d) Other person: Traditional birth attendant (e), Relative/friend (f) Other (Specify) (x) No one (y)	Reporting having professional assistant during delivery (doctor, doctor's assistant, midwife, nurse): Yes (0), No (1) Hypothesis Four
"Where did you give birth to [Name of child]?" Home: Your home (11), Other home (12) Public Sector: Central hospital (21), Provincial hospital (22), District hospital/Health center (23), Communal health center (24), Delivery house (25), Other public (Specify) (26) Private medical: Private hospital/clinic (31), Other private medical (Specify) (36) Other (Specify) (96)	Reporting delivery at hospital/health facility: Hospital/Health facility (0), Not Hospital/Health Facility (1) Hypothesis Five

Main Independent Variable

Ethnicity. A rich body of research has reported significant correlation between ethnicity and prenatal care. Most of them suggested disadvantages of ethnic minorities in accessing prenatal care (Do, 2009; Lieu et al., 2007; Målqvist et al., 2010; Sepehri et al., 2008). The question on ethnicity in DHS 2002 asked each Vietnamese woman which group of ethnicities she belonged to. They gave the answers of being a Viet (also known as Kinh), Tay, Thai, Chinese, Khmer, Muong,

Table 3.2

Original and Recoding of the Main Independent and the Control Variables

Original Questions	Recoded Variables
What ethnic group do you belong to? Vietnamese (01), Tay (02), Thai (03), Chinese (04), Khmer (05), Muong (06), Nung (07), Hre (08), Phu La (10), Ede (11), Dao (12), Co tu (13), Cham (14), Other (Specify) (96)	Ethnicity: Minority (1), Majority (2)
How old were you at your last birthday? Age in completed year	Age: 15-29 (3), 30-39 (2), 40-49 (1)
What is the highest grade of education you have completed? Grade College/university (15)	Education: No education (1), Primary (2), and Secondary and Higher (3)
Aside from your own housework, are you currently working? Yes (1), No (2) Do you do this work for a family member, a cooperative, the government, someone else, or are you self-employed? A family member (1), A cooperative (2), The government (3), Someone else (4), Self-employed (5)	Employment: Government/Enterprise (3), Others (2), and Do not work (1)
In which province is that located? Name of province	Region: Upland (Northern Uplands, Central Highland) (1), Center (Central Coast, Northern Central) (2), Lowland (Red River Delta, Mekong River Delta, Southeast) (3)

Nung, Hre, Phu La, Ede, Dao, Co Tu, Cham, or Other. The ethnicity question is recoded into a dichotomous variable in this thesis. Viet/Kinh and Chinese are grouped as “ethnic majority,” the rest belongs to “ethnic minority.” Two groups of ethnicity are the main concern of this thesis: whether a woman belonged to ethnic majority (Viet/Kinh and Hoa/Chinese) (2) or ethnic minority (Others) (1).

Table 3.2 exhibits how the original questions are recoded into independent variables. The ethnicity is the main independent variable. Age, education attainment, employment, and region are other independent or control variables.

Other Independent/Control Variables

Socio-demographic variables used as control variables in the examination of the effects of ethnicity of prenatal health care are: age, education attainment, employment, and region. These variables are also treated as independent variables when their effects are examined independent of one another and ethnicity.

Age. Women aged from 15 to 49 were chosen to take part in the survey. For this study, age of respondents is divided into three categories and coded as shown in parentheses: 15-29 (3), 30-39 (2), 40-49 (1) years old in this thesis. Recoding the age of the participant makes it possible to compare between young adults, adults, and older women. Studies have suggested that age is used as a determinant of prenatal usage. Simkhada et al. (2007) reviewed studies on prenatal care and pointed out that age plays a significant importance in prenatal usage. They also found that many women have their first birth when they are 15-29 years old. Along with Simkhada et al. (2007), Do (2009) suggested that women are more cautious with the first pregnancy and are more likely to seek prenatal care. Based on previous studies, the group of women aged 15-29 at the time of DHS 2002 is made the referential group in logistic regression analysis.

Education attainment. Level of education is among the most robust variables in affecting the coverage of prenatal care. Women with higher levels of education tend to consume more prenatal health services and produce a healthier baby (Hanmer, Lensink, and White, 2010; Say & Rain, 2007; Simkhada et al., 2007). The DHS 2002 education question asked the highest grade the woman had. Education attainment is recoded into three categories: No education (1), Primary (2), and Secondary and Higher (3).

Employment. Employment has been found as a determinant of prenatal health utilization in terms of having benefits from the employers (Graner et al., 2010;

Målqvist et al., 2011). Målqvist et al. (2011) found women with governmental employment earned health benefits from insurance coverage, while women who worked outside the governmental sector were less likely to engage in any health insurance program. In the DHS, the question on occupation asked what occupation women worked to earn money. Types of occupation are grouped into three categories regarding employers: Government/Enterprise (3), Others (2), and Do not work (1). Women who are employed with any kind of the government or enterprise employment are entered as a referential group in logistic regression.

Region. Annual studies by some worldwide organizations have indicated disparities in prenatal care between geographic regions (Central Intelligence Agency [CIA] World Factbook, 2011; WHO, 2001; UNICEF, 2011). Regions in the world or in the country not only locate in different geological areas, but they also reflect differences in socio-economic context. The more developed the regions are, the more coverage of health services and the less adverse health outcomes they have (WHO, 2001, UNICEF, 2011). For the analysis conducted in this thesis, Vietnam is divided into seven geographic and socio-economic regions in DHS 2002. These regions are widely used in descriptions of Vietnam. They are: Upland (1), Center (2), Lowland (3). The most developed region is the Lowland. The least developed region is the Upland (GSO, 2010). In this thesis, the Lowland is chosen as a reference in all logistic analyses. The original questionnaire only asked about the name of the city/province where the women resided. This thesis adapted the reconstruction of DHS research team in locating the cities/provinces into seven regions.

Analytical Techniques

Multivariate analysis will be employed to analyze the relationships between ethnicity and prenatal care usage. By including more than one variable at a time, multivariate analysis shows the variation of prenatal care utilization between minority

and majority women independent of other variables in the multivariate analysis. It also allows composing a multi-dimension of prenatal care utilization disparity when other control variables are introduced. For example, among women in the same geographic regions, women of ethnic minority were more vulnerable and less exposed to basic health care programs (Baulch et al., 2008). Such findings can only be drawn from a multivariate analysis.

Descriptive statistics and logistic regression will be the two analytical techniques employed in this thesis. Both statistical techniques are conducted in SPSS 19.0, using the Complex Sampling Model. Descriptive statistics give some basic statistics on prenatal care utilization, ethnicity, and the control variables. The descriptive analysis will show the percentage distribution and number of cases for prenatal utilization, ethnicity and each of the control variables followed by bivariate cross tabulations that show the relationships between prenatal care and each others variable. Chi square test of statistical significance will be employed.

Previous research on prenatal care and health outcomes has shown a common usage of logistic regression. Logistic regression will show more advantages than other statistical tests when only two categories are found in the dependent variables (Do, 2009; Lieu et al., 2007; Sepehri et al., 2008). There is no range between 0 and 1 limitation in logistic regression. It allows users to identify the negative and positive infinity of measurements. The outcome variable can be predicted from multiple predictors. One of the advantages in using logistic regression is that it does not require a normal distribution of the outcome variable (Warner, 2008). It makes logistic regression fit in this thesis analysis.

CHAPTER IV

RESULTS

This chapter applies statistical tests to examine the relationship between control variable and ethnicity, as well as between ethnicity and prenatal care usage in Vietnam from 1999 to 2002 as reported in the 2002 DHS. The first part is composed of table 4.1, figure 4.1. These tables show the bivariate relationships between ethnicity and other variables and are descriptive. The second part has three logistic tables (4.2, 4.3, and 4.4). The main purpose of the logistic tables is to examine the effects of ethnicity on prenatal care usage during pregnancy after controlling for other variables. The third part consists of two tables (4.5 and 4.6). Each table is used to test one of the five sub-hypotheses first stated in Chapter I. These logistic tables analyze change in odd ratios as control variables are introduced in four models for women reporting prenatal care at time of giving birth. The effects of the control variables are also examined.

Bivariate Relationships

Table 4.1 displays the bivariate relationship between ethnicity and each of the control variables. These results indicate statistically significant differences between the majority and minority groups on all variables, except age, with *p<.01, 95% CI*. While 74.6% of ethnic majority women received secondary or higher education, only 30.5% of ethnic minority women had received secondary or higher education. Only 2.1% of ethnic majority women had no education, much less than that of ethnic minority women (31.3%). With respect to employment, most of the women in both ethnic groups report other types of employment (family members, someone else, or

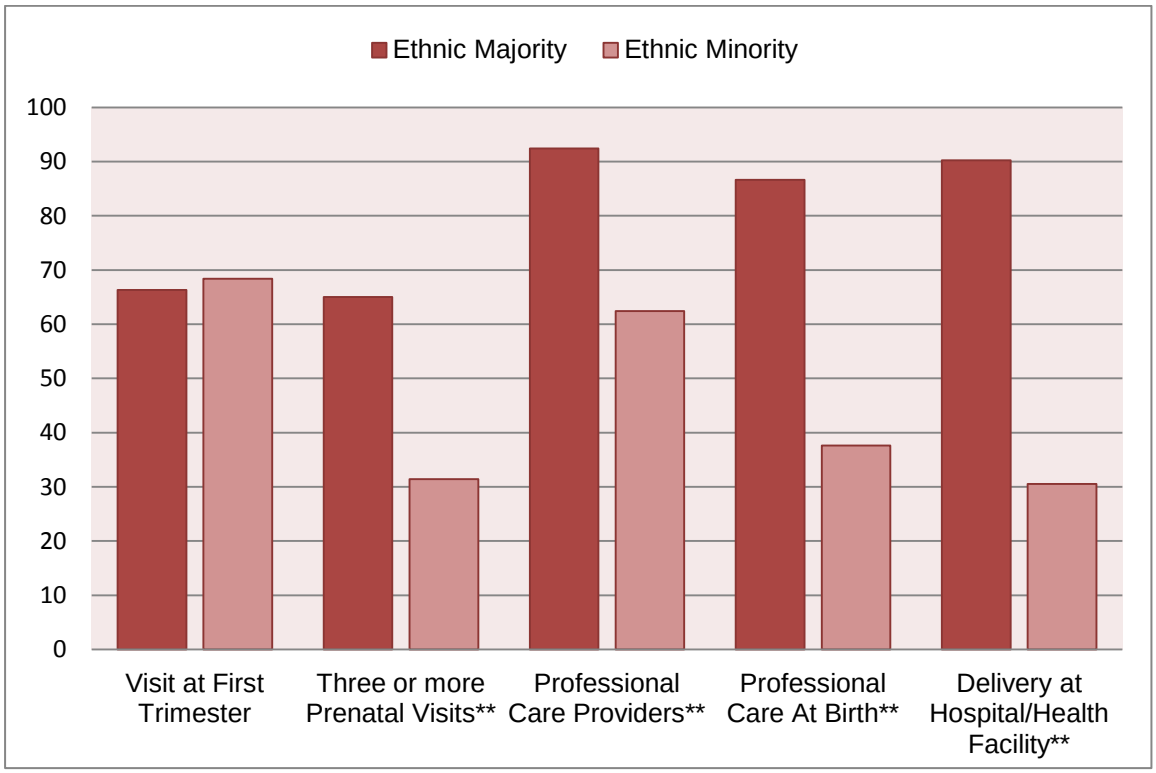
Table 4.1

Distribution of Women Reporting Giving Birth by Ethnicity (%)

Characteristics	Majority (N = 1037)	Minority (N = 184)
Age		
15-29	65.8	75.6
30-39	31.7	19.8
40-49	2.5	4.6
Education Attainment**		
No Education	2.1	31.3
Primary	23.3	38.2
Secondary and Higher	74.6	30.5
Employment		
Government/Enterprise	17.2	2.1
Other	70.1	93.9
Do not work	12.7	4.0
Region**		
Upland	12.4	73.6
Center	29.1	16.2
Lowland	58.5	10.2

**p<0.05, **p<0.01*

self-employed, 70.1% for ethnic majority, and 93.9% for minority women. Ethnic minority women are less likely to have a governmental occupation or work in a private enterprise (2.1%) when compared with ethnic majority women (17.2%). A higher percentage (12.7%) of the women in the majority than of the women in the minority group (4.0%) reported that they do not work. While ethnic majority women spread out along Vietnam, a larger percentage of majority reported residing in the Lowland (58.5%). In contrast, ethnic minorities are largely found in the Upland (73.6%). Although it is not statistically significant, a large percentage of minority women (75.6%) belong to the group of 15-29 while that of majority women is 65.8%. Overall, these tables show significant differences between the majority and minority groups in Vietnam.



*p<0.05, **p<0.01

Figure 4.1. Percentages of women reporting timing and type of prenatal care by ethnicity.

Figure 4.1 reveals the prenatal care utilization for the most recent "single birth" for women in the 2002 DHS. Ethnic minorities show almost no difference from ethnic majority women with respect to the percentage having their first prenatal care visit during the first 3 months of pregnancy. Of the minority women, 68.4% report obtaining prenatal care during the first trimester compared to 66.3% of the women in the majority group. The differences are not statistically significant. This is a surprising result and may be due to the utilization of non-professional prenatal care, for example, a visit to a traditional birth attendant. Other prenatal care usages show significant difference between the ethnic majority and ethnic minority groups. There is a huge gap between ethnic majority and minority in proportion that are making three or more visits for prenatal care as recommended by the VMOH. Figure 4.1 shows that only 31.4% of minority women made three or more visits for prenatal care,

whereas 65.0% of ethnic majority women receive prenatal care three or more times during their pregnancy. Women who belong to the ethnic majority were much more likely than minority women to receive prenatal care from a professional during their pregnancies. Indeed, 92.4% of the majority women received care from a professional caregiver whereas, only 62% of the minority women reported receiving professional care. When asked about whether the woman had professional assistance during delivery, the same trend was seen for both ethnic minority women (37.6%) and majority women (86.6%). Place of delivery also shows evidence of ethnic disparities in prenatal care between ethnic majority and minority in Vietnam. While 9.8% majority women gave birth at home, 69.5% of ethnic minorities gave birth at their homes or someone else's homes. Only 30.5% of ethnic minorities delivered at a hospital or health facility, compared to 90% of the majority women.

Logistic Regression Results for Prenatal Care Utilization During Pregnancy

Hypothesis One: Minority Women Will Be Less Likely Than Majority Women to Receive Prenatal Care in the First Trimester

Table 4.2 reports odd ratios for four models for women reporting whether they received prenatal care in the first trimester. Results reported in this table lead to the rejection of hypothesis one that minority women will be less likely than majority women to receive prenatal care during the first trimester of their pregnancies. Four models are included to illustrate change in odd ratios when different variables are added. The basic model, with ethnicity as the only independent variable, shows that members of the minority groups and the majority groups are equally likely to receive prenatal care in the first trimester, as also reported in the bivariate analysis. The odds for the minority and majority groups remain statistically equal in model 2. Unexpectedly, the odds of minority women receiving prenatal care during the first trimester become significantly higher than for majority women in model 3 and model

4. When region of residence is added in model 4, the minority women are 1.7 times as likely as majority women to report receiving some type of prenatal care during the first trimester. As suggested previously, it might be that minority women are reporting non-professional care because the wording of the question did not allow for distinguishing between professional and non-professional care during the first trimester. The odds ratios for the control variables reveal statistically significant differences in receiving prenatal care during the first semester for education and region but not for age or employment status. For the most part, the differences are as one might expect. Less educated women and women not living in the Lowland have lower odds of receiving prenatal care during the first trimester. The least educated women have lower odds when compared to the standard category than any other category in comparison to their respective standard (comparative) category.

Hypothesis Two: Minority Women Will Be Less Likely Than Majority Women to Receive Three or More Prenatal Checkups

Table 4.3 exhibits odd ratios for women reporting three or more prenatal visits. Results support the above hypothesis. The basic model shows a much lower odd of minority women reporting having three or more prenatal visits. The second model has the same effect of ethnicity on having three or more prenatal visits. Women aged 30-39 are almost the same with women age 15-29 in utilizing three or more visits. Model 3 added education attainment and employment. Education has a significant effect on number of prenatal visits. Only 13% of women with no education and 28% of women with primary education reported that they had three or more visits. When compared with the referral group in employment, women not working showed 59%, and women working for others showed 50% more likely to report three or more prenatal visits. The full model shows statistically significant effects on number of prenatal care usages by education and region. The effects of age are not statistically significant in the full model. The results in the full model indicate that

women with no formal education are only 15% as likely as women with a secondary or higher level of education to make three or more visits for prenatal. This is the largest disparity revealed in Table 4.3. Women who work for someone other than the government/enterprise are about 59% as likely as women who work for the government to have three or more prenatal care usages. Of the regions, women in the Upland unexpectedly have higher odds than the odds of the Lowland women. Clearly, disparities of using prenatal care exist between ethnic minorities and ethnic majority groups and between other socioeconomic groups in Vietnam.

Hypothesis Three: Minority Women Will Be Less Likely Than Majority Women to Receive Prenatal Care from Professional Caregivers

Table 4.4 reports odd ratios for women with professional prenatal care. Hypothesis Three is supported by results from four models. In model 1, minority women were only 13% as likely to receive prenatal care from professionals as majority women. When age is included, the effect of ethnicity remained stable. Women age 40-49 reported significantly lower odds than the referential women. Odd ratios for minority women rose up when education attainment and employment were included in model 3. Unlike the effect of employment, education attainment showed significant effect. Illiterate women had only a 9% chance and women with primary education had a 16% likelihood of seeking prenatal care from professionals. Results in the full model show significant effects for receiving professional care for age, education, and region, but not for employment. The ratio for minority women reduced slightly when compared with model 3. In the full model, older women (ages 40-49) are just 40% as likely to have received professional care during the pregnancy as younger women. The largest disparity is with education. Women with no education are about 10% as likely to receive professional care as are women with a secondary or higher level of education. Women with a primary education are 19% as likely as women with a secondary or higher level of education to receive professional care

during their pregnancies. When compared among regions, the Upland women are 13% more likely than the Lowland women to obtain prenatal care from professionals.

Logistic Regression Results for Prenatal Care Utilization During Delivery

Hypothesis Four: Minority Women Will Be Less Likely Than Majority Women to Have a Professional Birth Attendant Present When Giving Birth

Table 4.5 presents the odds ratios for women of having professional assistance when giving birth. Results shown in Table 4.5 support hypothesis four: Minority women will be less likely than majority women to have a professional birth attendant present when giving birth. In the basic model ethnic minority women are just 9% as likely to have care from a professional at the time of delivery as majority. While this disparity is reduced in models as control variables are introduced, the differences remain statistically significant throughout the models. Surprisingly, a different pattern of prenatal care utilization is found for the effect of age, although it is not significant. Across all models, women at a higher age are more likely than young women (15-19) to have professional birth attendants. The effect of education still has the same significance with lower odds for women with less education attainment. Employment does not show significant effect on the reporting of professional birth attendants. In the full model (model 4) minority women are still only 18% as likely to receive professional care from a professional caregiver at the time of birth as majority women. Two of the four control variables (education and region) have significant effects on whether a professional birth attendant is present when women are giving birth. The odds of a professional being present at the time of delivery for women with no education are .169 and .500 for women with a primary education in the full model. Odds ratio for women in Upland and Center are much lower than the referral.

Table 4.2

Adjusted Odd Ratios (AOR) for Women Reporting First Prenatal Care in First Trimester

Characteristics	Model 1			Model 2			Model 3			Model 4		
	AOR	95% CI		AOR	95% CI		AOR	95% CI		AOR	95% CI	
Ethnicity												
Minority	1.101	.686	1.767	1.066	.662	1.715	1.687*	1.063	2.678	1.702*	1.036	2.998
Majority	1.000			1.000			1.000			1.000		
Age												
40-49				.552	.234	1.302	.680	.260	1.776	.724	.272	1.924
30-39				.779	.558	1.087	.738	.520	1.049	.759	.532	1.083
15-29				1.000			1.000			1.000		
Education Attainment												
No Education							.360*	.179	.725	.344**	.169	.710
Primary							.431**	.303	.613	.414**	.291	.590
Secondary and Higher							1.000			1.000		
Employment												
Do not work							.572	.303	1.081	.585	.311	1.098
Others							.476**	.238	.802	.514	.307	.862
Government/Enterprise							1.000			1.000		
Region												
Upland										.893	.560	1.424
Center										.660*	.459	.948
Lowland										1.000		
Valid N (Unweighted cases)	1,069			1,069			1,069			1,069		

*$p<.05$, **$p<.01$

CI, Confidence Interval

Table 4.3

Adjusted Odd Ratios (AOR) for Women Reporting Three or More Prenatal Visits

Characteristics	Model 1			Model 2			Model 3			Model 4		
	AOR	95% CI		AOR	95% CI		AOR	95% CI		AOR	95% CI	
Ethnicity												
Minority	.247**	.120	.509	.253**	.124	.516	.517	.261	1.024	.459*	.250	.841
Majority	1.000			1.000			1.000			1.000		
Age												
40-49				.485*	.264	.890	.672	.348	1.299	.697	.353	1.376
30-39				1.152	.863	1.538	1.101	.816	1.484	1.147	.843	1.560
15-29				1.000			1.000			1.000		
Education Attainment												
No Education							.134**	.063	.287	.121**	.056	.263
Primary							.285**	.206	.394	.273**	.195	.381
Secondary and Higher							1.000			1.000		
Employment												
Do not work							.591	.345	1.012	.607	.353	1.042
Others							.502*	.316	.797	.557*	.357	.863
Government/Enterprise							1.000			1.000		
Region												
Upland										1.069	.717	1.594
Center										.556**	.389	.795
Lowland										1.000		
Valid N (Unweighted cases)	1,221			1,221			1,221			1,221		

*$p<.05$, **$p<.01$

CI, Confidence Interval

Table 4.4

Adjusted Odd Ratios (AOR) for Women Reporting Having Professional Prenatal Care Providers

Characteristics	Model 1			Model 2			Model 3			Model 4		
	AOR	95% CI		AOR	95% CI		AOR	95% CI		AOR	95% CI	
Ethnicity												
Minority	.136**	.077	.243	.137**	.078	.242	.306**	.204	.458	.247**	.157	.388
Majority	1.000			1.000			1.000			1.000		
Age												
40-49				.274**	.139	.538	.410*	.191	.880	.424*	.195	.922
30-39				.984	.628	1.543	.866	.552	1.359	.879	.556	1.392
15-29				1.000			1.000			1.000		
Education Attainment												
No Education							.098**	.039	.245	.092**	.036	.231
Primary							.164**	.104	.258	.165**	.104	.262
Secondary and Higher							1.000			1.000		
Employment												
Do not work							.636	.289	1.399	.644	.294	1.409
Others							.604	.332	1.097	.617	.338	1.127
Government/Enterprise							1.000			1.000		
Region												
Upland										1.390	.828	2.333
Center										.837	.569	1.231
Lowland										1.000		
Valid N (Unweighted cases)	1,220			1,220			1,220			1,220		

*$p<.05$, **$p<.01$

CI, Confidence Interval

Hypothesis Five: Minority Women Will Be Less Likely Than Majority Women to Have Their Births in a Hospital or Health Facility

Table 4.6 shows odd ratios for women reporting whether their birth was at a hospital or a health facility. Results reported in Table 4.6 support hypothesis five that minority women will be less likely than majority women to have their births in a hospital or health facility. Indeed, the basic model reveals that minority women are about 5% as likely to give birth in a hospital or health facility as majority women. These odds increase somewhat as control variables are introduced but the disparity remains substantial in each of the models. Similar to odd ratios for women reporting having professional birth attendants, women at older ages are almost the same or more likely to deliver at a hospital than young women (15-29), although age does not have a significant effect. In the full model (model 4) the odds ratio for minority women compared to majority women giving birth in a hospital or other health facility is only .135. As with the results depicted for the first four measures of prenatal care, the effects of education on whether the delivery occurred in a hospital or other health facility are statistically significant. Women with no education are about 22% as likely to deliver their babies in a hospital or health facility as are women with a secondary or higher level of education. Women in the Upland and Center also have statistically significant lower odds of giving birth in a professional health facility.

Prenatal care utilization is studied by five measurements: timing of entrance to prenatal care visits, number of prenatal care visits, prenatal care provider, place of giving birth, and assistant at birth. The first three measurements are listed as prenatal care during pregnancy. The last two measurements are prenatal care during delivery.Results have found significant differences between ethnic majority and minority women in prenatal care utilization during pregnancy and delivery. Except for the timing of the first prenatal visit, ethnic minority women are less likely to utilize good prenatal care services practiced by professionals. Patterns of prenatal care usage also stratified among groups of women when age, education attainment,

employment, and region are controlled. Region and education attainment have shown significant effect on prenatal care utilization, but education attainment has stronger effect.

Table 4.5

Adjusted Odd Ratios (AOR) for Women Reporting Having Professional Assistant at Birth

Characteristics	Model 1			Model 2			Model 3			Model 4		
	AOR	95% CI		AOR	95% CI		AOR	95% CI		AOR	95% CI	
Ethnicity												
Minority	.093**	.053	.166	.094**	.052	.169	.143**	.076	.270	.197**	.116	.334
Majority	1.000			1.000			1.000			1.000		
Age												
40-49				1.261	.525	3.027	1.674	.699	4.010	1.620	.713	3.682
30-39				1.117	.665	1.876	1.076	.629	1.839	1.085	.643	1.833
15-29				1.000			1.000			1.000		
Education Attainment												
No Education							.305*	.103	.909	.309**	.099	.968
Primary							.549**	.357	.843	.520*	.343	.789
Secondary and Higher							1.000			1.000		
Employment												
Do not work							.760	.297	1.947	.749	.286	1.965
Others							.685	.302	1.554	.748	.331	1.694
Government/Enterprise							1.000			1.000		
Region												
Upland										.521*	.277	.983
Center										.739	.430	1.270
Lowland										1.000		
Valid N (Unweighted cases)	1,220			1,220			1,220			1,220		

*$p<.05$, **$p<.01$

CI, Confidence Interval

Table 4.6

Adjusted Odd Ratios (AOR) for Women Reporting Delivery at Hospital/Health Facility

Characteristics	Model 1			Model 2			Model 3			Model 4		
	AOR	95% CI		AOR	95% CI		AOR	95% CI		AOR	95% CI	
Ethnicity												
Minority	.047**	.024	.092	.048**	.024	.095	.077**	.034	.175	.142**	.070	.289
Majority	1.000			1.000			1.000			1.000		
Age												
40-49				1.018	.400	2.593	1.312	.468	3.680	1.227	.567	2.654
30-39				1.197	.652	2.195	1.154	.618	2.155	1.237	.654	2.340
15-29				1.000			1.000			1.000		
Education Attainment												
No Education							.344*	.123	.960	.305*	.089	1.043
Primary							.563*	.327	.969	.441*	.253	.771
Secondary and Higher							1.000			1.000		
Employment												
Do not work							.453	.151	1.359	.403	.118	1.373
Others							.264*	.099	.704	.372	.132	1.052
Government/Enterprise							1.000			1.000		
Region												
Upland										.105**	.048	.230
Center										.114**	.056	.230
Lowland										1.000		
Valid N (Unweighted cases)	1,221			1,221			1,221			1,221		

*$p<.05$, **$p<.01$

CI, Confidence Interval

CHAPTER V

DISCUSSION AND CONCLUSION

The final chapter will first summarize main points from chapters I to IV. The results will be discussed based on the hypothesis and how they relate to previous research. Secondly, this chapter discusses limitations, policy implications, and suggestions for future research.

Prenatal care is known as medical care for pregnant women to reduce risks of adverse pregnancy outcomes and increase maternal and infant health (WHO, 2003, 2007). To examine prenatal care usage, researchers have proposed various ways to measure prenatal care utilization (Målqvist et al., 2010). The WHO pays attention to prenatal care utilization in the developing countries for high rates of neonatal, perinatal, and maternal mortality and morbidity (WHO, 2011). Recently, Vietnam has shown improvement in prenatal care coverage (Lieu et al., 2006; Tran et al., 2011). Although the government has put a lot of effort in to implementing health care programs for pregnant women, Vietnam still experiences high neonatal and infant mortality rates (CIA, 2011; WHO, 2006). This fact brings up a question: Why, when implemented by the government, are prenatal care programs and behaviors ineffective in reducing the rate of neonatal and infant mortality?

A body of prior research has found prenatal care disparities between groups of women in the world (Houweling et al., 2007; Paul & Singh, 2003; Say & Raine, 2007; Simkhada et al., 2007). Their findings suggest a gap in prenatal care utilization between women of different races/ethnicities, age, geographic regions, household income, and occupation. Additionally, other determinants such as availability and accessibility to prenatal care, insurance coverage, quality and cost of services, media exposure, parity, and culture, are also found significantly correlated with prenatal care utilization. Keeping consistent with these findings in prenatal care usage in the

world, the same patterns are found for Vietnamese women consuming prenatal care in some parts of Vietnam.

Previous research on prenatal care usage in Vietnam has revealed ethnic disparity and stratifications between groups of women regarding ethnicities, provinces, geographic regions, religions, education attainment, age, insurance coverage, distance to health facilities, cost effectiveness, and media exposure (Do, 2009; Lieu et al., 2006, 2007; Magadi et al., 2000; Malin & Gissler, 2009; Say & Raine, 2007; Sepheri et al., 2008; Tran et al., 2011). In conjunction with research on prenatal care in Vietnam, other research on ethnic disparities report a growing gap between health care consumption between ethnic groups (Baulch et al., 2008; Imai et al., 2011; Walle, & Gunewardena, 2001). Although these two bodies of research have mentioned prenatal care disparities between ethnic groups Kinh/Viet and Hoa (ethnic majority), and the 53 other ethnicities (ethnic minority), none of them have provided a multivariate analysis on this health issue for the nation as a whole.

Based on the need for filling the gap of research on prenatal care utilization, this thesis examined the ethnic disparities in prenatal care utilization between ethnic majority and ethnic minority women. Besides the main purpose, this thesis also examines the effects of other control variables (age, geographic regions, education attainment, and women employment) on prenatal care usage. This thesis used data from the DHS 2002 to test five hypotheses.

To conduct this research, the DHS 2002 phase III in Vietnam was employed. 5,665 married women aged 15-49 engaged in the survey. Data used to analyze is drawn from 1,221 women who gave birth to a living child in the three years prior to this survey. The thesis excluded 4,444 women who did not give birth. Among 1,221 women, 1,037 are in the ethnic majority, 184 are in the ethnic minority. SPSS 19 with Complex Sampling Model is used for descriptive analysis and logistic regression.

Prenatal care is measured by time a woman received her first prenatal check-up, number of prenatal visit, providers of prenatal care, place of delivery, and if a birth attendant is present. The main independent variable is ethnicity with two categories (ethnic majority, and ethnic minority). Other independent and control variables are age, region, education attainment, and employment.

Findings from this thesis research show stratification in women of different socio-demographic groups. Socio-demographic patterns of women participating in the DHS 2002 in Vietnam are examined. Comparing between two groups of ethnicity, minority women who reported giving birth between 1999-2002 tended to be at younger age than women of ethnic majority. Ethnic minority has a significantly higher percentage of illiterate women, while ethnic majority has a very small %age of women with no education. Ethnic minority also has a much lower %age of women with secondary and higher level of education. The same patterns of ethnic disparities are perceived when the women were asked about their employment. Not many ethnic minority women reported employment by the government or an enterprise. Most of them work for others, which includes working for family members and being self-employed. More ethnic majority women report working for the government or enterprise, although the largest population work for others. Working for the government or enterprise meant being insured with a health insurance program and receiving health information from associations such as the Labor Union. A slightly higher percentage of women not working is reported for the ethnic majority. Region is also included in this research. None of the ethnic minority women resides in the Southeast. Most of the ethnic minority groups are located in the Upland, while the vast of the ethnic majority are found in the Lowland. These findings are identical with findings from prior research on ethnic disparities in Vietnam. Baulch et al. (2007), Imai et al. (2011), and Walle and Gunewardena (2001) defined ethnic minority as being “Upland People” and stratified from “Lowland People.” Their research

suggested that people in the ethnic minority are less educated than the majority. The ethnic minority is vulnerable to various shocks, for example natural disasters, and they experience difficulties in recovering from such shocks. They also have higher fertility rate with a larger family. Their economic status is credited with being unstable. They have a lower standard when compared with the people of the ethnic majority.

Main Findings

The main purpose of this thesis was to determine the extent to which ethnic disparities exist after controlling for other social and demographic variables known to be related to utilization of prenatal care. The main hypothesis was that ethnic minority women will be less likely than majority women in Vietnam to receive the level and kinds of prenatal care prescribed by the WHO and the VMOH. Five sub-hypothesis were used to test this main hypothesis. As depicted in Table 5.1, results of this study support four of the five sub-hypothesis and thereby lend strong support to the main or overall hypothesis. Indeed, in the full models minority women were: (1) only 45% as likely as majority women to have three or more prenatal care visits; (2) only 25% as likely as majority women to receive professional care; (3) only 18% as likely to have a professional birth attendant present when giving; birth and (4) only 13% as likely as majority women to give birth in a hospital or other health facility. Certainly, these results provide support for the overall hypothesis that minority women are less likely than majority women to receive the level and type of prenatal care prescribed by the WHO. The hypothesis that minority women will be less likely than majority women to receive prenatal care in the first trimester was not supported. In fact in the full model minority, women were 1.7 times more likely than majority women to report receiving prenatal care in the first trimester. The most likely reason

for the lack of support may be that the question asking about care in the first trimester did not ask respondents to distinguish between traditional and professional prenatal care during this time of their pregnancy. It may be that minority women receive and report nonprofessional care during the first trimester.

For the first measurements in prenatal care during pregnancy, both percentages and odd ratios suggest no difference between ethnic majority and minority. Both statistical tests have an insignificant result. Ethnic minority women have a slightly higher chance of entering prenatal care early in the first trimester than those of the ethnic majority. When controlling for age, education attainment, employment, and region, the odd ratios of minority go up. Meanwhile, with the inclusion of education level, employment, and region, ethnic minority women can be 1.7 or 1.8 times more likely to enter prenatal care earlier than majority women. These findings reject the hypothesis of late prenatal care entry for ethnic minority women and correspond with results from research by Braveman, Cubbin, Marchi, Egerter, and Chavez (2001), Choté et al. (2011), and Lieu et al. (2006). However, when reviewing the questionnaire, the question on the timing of first prenatal care does not ask if the first prenatal checkup is performed by professionals or non-professionals. Minority women might seek prenatal care by non-professional caregivers, for example traditional birth attendants residing in the neighborhood (Baulch et al., 2007; Imai et al., 2011; Walle & Gunewardena, 2001). The second measurement for prenatal care is the number of prenatal visits during the pregnancy. Again, the question did not ask the women from whom they had pregnancy check-ups. However, the results are statistically significant, with higher percentages and odd ratios for ethnic majority women reporting having three or more visits. Odd ratios for minority rise up when controlling for age, education attainment, employment, and region. These results strongly support the hypothesis that ethnic minority women have less prenatal care visits than ethnic majority women do. Results also show

consistency with previous research on prenatal care visits (Lieu et al., 2007; Sepehri et al., 2008; Tran et al., 2011).

When multivariate analysis is included, women of the ethnic majority, between the ages of 30-39, who have a secondary and higher education level, who are employed by the government or an enterprise, who are residence of the Upland have the highest chances of having three or more prenatal visits. The third measurement is about prenatal care providers, asking whether the women sought care from professionals or non-professionals. Similar to findings from Målqvist et al. (2011) and Tran et al. (2011), this thesis suggests a larger population of ethnic majority women is seeking prenatal care from professional care providers. When controlled for other determinants, women aged 40-49, have no education, and live in the Central Coast have significantly lower odds than women in other groups. Employment does not show significant association with prenatal care providers. However, being employed by others reduces the odds of having professional prenatal care providers. Results from this measurement strengthen the hypothesis of less professional care utilization for ethnic minority women.

The second set of measurements is composed of delivery patterns. A significantly higher percentage and ratio of majority women reported having professional assistance during delivery. Findings are supportive for the hypothesis starting that ethnic minority women are less likely to seek care from a professional assistant during delivery. When controlled for other variables, odd ratios go up for the ethnic minority. Employment and age are not statistically significant, but these two variables suggest a different angle to approach prenatal care utilization during delivery. Unlike age patterns for prenatal care during pregnancy, women aged 40-49 reported higher odds than younger women. This finding relates to previous findings, suggesting that teenagers and women aged older than 35 are likely to experience complications during pregnancy (Do, 2009; UNICEF, 2011; WHO, 2006).

Table 5.1

Adjusted Odd Ratios (AOR) for Women Reporting Timing and Type of Prenatal Care

Characteristics	First Visit in First Trimester			Three or More Visits			Professional Care Providers			Professional Delivery Assistant			Hospital/Health Facility Delivery		
	AOR	95% CI		AOR	95% CI		AOR	95% CI		AOR	95% CI		AOR	95% CI	
Ethnicity															
Minority	1.702*	1.036	2.998	.459*	.250	.841	.247**	.157	.388	.197**	.116	.334	.142**	.070	.289
Majority	1.000			1.000			1.000			1.000			1.000		
Age															
40-49	.724	.272	1.924	.697	.353	1.376	.424*	.195	.922	1.620	.713	3.682	1.227	.567	2.654
30-39	.759	.532	1.083	1.147	.843	1.560	.879	.556	1.392	1.085	.643	1.833	1.237	.654	2.340
15-29	1.000			1.000			1.000			1.000			1.000		
Education Attainment															
No Education	.344**	.169	.710	.121**	.056	.263	.092**	.036	.231	.309**	.099	.968	.305*	.089	1.043
Primary	.414**	.291	.590	.273**	.195	.381	.165**	.104	.262	.520*	.343	.789	.441*	.253	.771
Secondary and Higher	1.000			1.000			1.000			1.000			1.000		
Employment															
Do not work	.585	.311	1.098	.607	.353	1.042	.644	.294	1.409	.749	.286	1.965	.403	.118	1.373
Others	.514	.307	.862	.557*	.357	.863	.617	.338	1.127	.748	.331	1.694	.372	.132	1.052
Government/Enterprise	1.000			1.000			1.000			1.000			1.000		
Region															
Upland	.893	.560	1.424	1.069	.717	1.594	1.390	.828	2.333	.521*	.277	.983	.105**	.048	.230
Center	.660*	.459	.948	.556**	.389	.795	.837	.569	1.231	.739	.430	1.270	.114**	.056	.230
Lowland	1.000			1.000			1.000			1.000			1.000		
Valid N (Unweighted cases)	1,069			1,221			1,220			1,220			1,221		

*$p<.05$, **$p<.01$

CI, Confidence Interval

To avoid complications, they tend to seek delivery care from professionals. Women who work for others also reported more likely to have professional assistance when giving birth. Graner et al. (2010) suggested that the fee for prenatal care during pregnancy and delivery in Vietnam is affordable, regardless of insurance coverage. This suggestion may fit in explaining the correlation between employment and professional care at delivery. Examining the second measurement of prenatal care usage at delivery, the same patterns are seen. While the hypothesis of ethnic minority women is being less likely to deliver at a hospital/health facility than ethnic majority women do, new findings are observed. The findings suggest that there is an association between older age and delivery at a hospital or health facility. This pattern is consistent with the effect of age on having professional assistance at a delivery as discussed above. However, the place of delivery does not show the same pattern in having professional assistance at the birth when employment and region are added. Women with government or enterprise employment still report higher odds of delivering at a hospital or a health facility. Sepehri et al. (2008) noted that among women with insurance, stratification between two insurance schemes were obtained. Women with health insurance for the poor were more likely to seek prenatal care than the uninsured. However, women with compulsory insurance, in other words, women working for governmental organization or enterprise, had higher odds for delivery at a health facility than the uninsured. The effect of region on delivery at a health facility is significant, with lower odds observed for women residing outside of the Lowland. Findings are similar with previous findings on how distance to a health facility affects delivery. Do (2009) and Målqvist et al. (2010) suggested that the further a health facility is from the woman's home, the more likely it is that home delivery is chosen.

Approaching from the angle of health status and health care consumption, ethnic minority women are seen as having less accessible to health care services

given by professionals (Betancourt et al., 2003; Braveman et al., 2001). They are more likely to practice traditional medicine and receive care from traditional caregivers, who are not professionals due to their tribal beliefs and culture (Baulch et al., 2008; Imai et al., 2011; Walle & Gunewardena, 2001). These facts are true for the study of ethnic disparities in prenatal care utilization in Vietnam. Ethnic minority women are proven to be less likely to employ professional care during pregnancy and delivery. This finding, along with other findings on stratification of prenatal care utilization among socio-demographic groups, demonstrates the need for a new approach to maternal health programs in Vietnam.

Limitations

Although this thesis employs high quality data from the DHS 2002 in Vietnam, some limitations of data usage still remain. The first limitation relates to self-report information. DHS asks a woman to report her ethnicity. The answer mainly relies on her family trait without obtaining any biological evidence. It brings up the issue of defining ethnicity. Ethnicity is more of a social and cultural concept than a biological one. The woman was biologically born to an ethnic minority group, but under the effects of acculturation, she reported same behaviors during prenatal care utilization with ethnic majority women. Other than that, some cases might have involved intermarriage of an ethnic minority woman with an ethnic majority husband. Vietnamese society is strongly influenced by Confucian, which depicts a patriarchal society. The ability for the woman to make a decision on reproduction health and childbearing is restricted. Information on their husband's ethnicity could not be found in DHS 2002 in Vietnam. Such limitations on women ethnicity, self-report, and intermarriage can create recall error for DHS.

Another limitation linked with ethnicity is how the ethnic majority is defined. General knowledge suggested that Kinh/Viet is considered the only ethnic majority in Vietnam. This thesis included Hoa (Chinese) in ethnic majority, based on evidence found in previous research on ethnic disparities in Vietnam. Generally, Chinese are proven to be equal to Kinh/Viet. Chinese have better economic standing than any other ethnic minorities. Nonetheless, the inclusion of Chinese as being an ethnic majority can bring up bias in treating other ethnic minorities. However, the number of Chinese participants in DHS 2002 Vietnam is relatively small. It is not possible to make a statistically significant change in adding Chinese to the ethnic minority. Moreover, the survey is based on recalling health status and health care consumption. Recall error can underestimate or overestimate the actual usage of prenatal care or any other health care. Despite the fact that the questions ask a woman to report her recent child births during the three years prior to the survey, the problem of underestimation or overestimation can't be eliminated. Especially for ethnic minorities, previous research indicates that ethnic minorities tend to report no illness without adequate understanding of the medical situation (Kogan, Kotelchuck, Alexander, & Johnson, 1994). Ethnic minorities were less likely to report poor health status and less likely to report health care consumption. These findings do not associate with better health status of ethnic minorities when compared with the ethnic majority. They imply that the ethnic minority women are unaware when regarding illness. In this case, ethnic minority women, without understanding of professional care during pregnancy and delivery, possibly reported that they were provided care from qualified doctors or nurses.

Additionally, another issue while drawing from DHS 2002 is the under-developed measurements of prenatal care utilization. Prenatal care usage is restricted in the number of prenatal care visits, timing of the first visit, care provider, delivery assistant, and place of delivery. Questions on timing of entry to prenatal care

and number of visits are unclear, with no clue of whether or not the women seek care from professionals or non-professionals. Although the question on care providers followed after these two questions, it still brings up an issue that the woman might seek professional care for the first visit, but later decide to continue with a non-professional care provider. Besides these five measurements of prenatal care utilization, DHS included tetanus injection. However, to remain consistent, tetanus injection seen as a content of a prenatal care check-up is excluded in analysis of prenatal care utilization. This limitation accompanied with the above discussions might somewhat affect the quality of this thesis research.

Policy Implications

Results from this research imply some benefits for policy makers. Firstly, results signify the ethnic disparities in health which are existing and expanding in Vietnam. The Vietnamese Government and the Communist Party have issued policies to foster the ethnic equity and help ethnic minorities. Such policies, for example poverty reduction programs and health insurance for the poor have proven low quality in promoting ethnic equity. Kogan et al. (1994) once found that health care insurance for the poor actually benefits the non-poor. Education is the most important key to help ethnic minority women. In terms of ethnic equity in health, education stands out as a main contribution to advocate better health status and better health care services.

Secondly, findings show some groups women with inadequate prenatal care utilization. Besides ethnic minority women, women of older age, illiterate women or those with only primary education, unemployed women or women who do not work for the government or an enterprise, women residing in the Upland and Center are generally having higher risks of adverse pregnancy outcomes due to inadequate

usage of pregnancy and delivery care. Findings from this thesis urge a special need for a prenatal care program aiming at women at higher risk of adverse pregnancy outcomes. Only by promoting education and by issuing specific programs to meet the needs of high risk women do women seeking prenatal care experience better coverage and attain better quality. Besides programming aiming at high risk women, other policies on gender equity are also needed. The influence of Confucian on Vietnamese society is still well-preserved, in which boy preference affects women reproduction and childbearing behaviors. Gender equity education should be emphasized in school and broadcasted nation-wide in the media. Specifically, gender equity education should involve men in women reproduction, childbearing, and rearing without boy preference bias.

Finally, quality of prenatal care should be taken into consideration. Although this thesis does not study quality of prenatal care, previous research stresses the importance of better services for pregnant women and better interaction between care providers and patients (Graner et al., 2010). Professional health care providers accentuated the need for training programs, human force, and better medical equipment to meet the needs of complications during pregnancy and delivery. Besides health professionals, traditional health providers play important roles in providing health care service in the neighborhood. Counter-productive practices of health care for pregnant women should be eliminated. Additional or adequate medical education for traditional care health providers are strongly suggested in remote areas where hospitals or health facilities is inaccessible. Improving quality of health care services and enhancing interaction between professional health providers and patients needs to be enacted at the same time of promoting women education and fostering gender and ethnic equity.

Suggestions for Future Research

Although there are limitations of using DHS and other limitations in analysis, research on ethnic disparities in prenatal care utilization should be continued. The most important addition that needs to be made in future research is developing a better set of measurements in studying prenatal care utilization in Vietnam. More information on content of prenatal care check-ups and behaviors during pregnancy and delivery should be added. With the release of new DHS phase V or later, and the existence of DHS phase II, conducting a longitudinal study on prenatal care utilization in Vietnam is possible. Women followed up in different periods of time can result in interesting findings of the pattern of prenatal care behaviors. Furthermore, this research should be extended to the effects of prenatal care utilization on delivery care, namely association between previous prenatal care during pregnancy and the women decision's on place of delivery. Another new approach is linking health care behaviors during pregnancy and delivery with health outcomes, for example prenatal care utilization and neonatal risk. Moreover DHS make it possible to make international comparison research on ethnic disparities in prenatal care utilization. Such inclusions are meaningful not only for adding up the literature on prenatal care utilization in Vietnam, but are also very beneficial for policy makers.

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APPENDIX

General Statistical Office
Vietnam Demographic and Health Survey - III

VNDHS-III 2002

Women's questionnaire

Identification	
Province/municipality: _____	☐☐☐
District: _____	
Commune: _____	
Cluster name: _____	
Cluster number:	☐☐☐
Name of household head: _____	
Household number:	☐☐☐
Address: _____	
Urban/rural (Urban = 1, Rural = 2):	☐
Large city/ small city/ town/ countryside (Large city = 1, Small city = 2, Town = 3, Countryside = 4):	☐
Name and line number of women: _____	☐☐

Interviewer visits				
	1	2	3	Final visit
Date	_____	_____	_____	Date ☐☐ Month ☐☐ Year ☐☐☐☐
Interviewer's name				Name ☐☐
Result (*)	_____	_____	_____	Result (*) ☐
	_____	_____	_____	
Next visit - Date	_____	_____		Total number of visits ☐
- Time	_____	_____		

(*) Result codes:
1 = Completed
2 = Not at home
3 = Postponed
4 = Refused
5 = Partly completed
6 = Incapacitated
7 = Other _____ (Specify)

Supervisor	Field editor	Office editor	Keyed by
Name _____ ☐☐	Name _____ ☐	☐☐	☐☐
Date _____	Date _____		

Sections 1. Respondent's background

No.	Questions and filters	Coding categories	Skip
101	Record the time	Hour ..... □□ Minutes ..... □□	
102	First I would like to ask some questions about you and your household. For most of the time until you were 12 years old, did you live in a city, in a town, or in the countryside?	City ..... 1 Town ..... 2 Countryside 3	
103	How long have you been living continuously in [Name of current place of residence]?	Years ..... □□ Always ..... 95 → 105 Visitor ..... 96 → 105	
104	Just before you moved here, did you live in a city, in a town, or in the countryside?	City ..... 1 Town ..... 2 Countryside 3	
105	In what month and year were you born?	Month ..... □□ Don't know month ..... 98 Year ..... □□□□ Don't know year 9998	
106	How old were you at your last birthday? Compare and correct 105 and/or 106 if inconsistent	Age in completed year ..... □□	
106A	What is your current marital status?	Currently married ..... 1 Widowed ..... 2 Divorced ..... 3 Separated 4	
107	Have you ever attended school?	Yes ..... 1 No ..... 2 → 114	
108	What is the highest grade of education you completed? Use equivalency table	Grade ..... □□ College/university 15	
110	Check 106: Less than Age 25 □	Age 25 or above □ → 113	
111	Are you currently attending school?	Yes ..... 1 → 113 No 2	

No.	Questions and filters	Coding categories	Skip
112	What was the main reason you stopped attending school?	Got pregnant ..... 01 Got married ..... 02 To care for younger children ..... 03 Family needed help on farm or in business ..... 04 Could not pay school fees ..... 05 Needed to earn money ..... 06 Graduated/had enough schooling ..... 07 Did not pass entrance exams ..... 08 Did not like school ..... 09 School not accessible/too far ..... 10 Other ..... 96 (Specify) Don't know 98	
113	Check 108: Grade 5 or Less ☐	Grade 6 or higher ☐ →	115
114	Can you read and understand a letter or newspaper easily, with difficulty, or not at all?	Easily ..... 1 With difficulty ..... 2 Not at all ..... 3 →	116
115	Do you usually read a newspaper or magazine at least once a week?	Yes ..... 1 No 2	
116	Do you usually listen to a radio every day?	Yes ..... 1 No 2	
117	Do you usually watch television at least once a week?	Yes ..... 1 No 2	
118	What is your religion?	No religion ..... 01 Buddhist ..... 02 Catholic ..... 03 Protestant ..... 04 Cao Dai ..... 05 Hoa Hao ..... 06 Islam ..... 07 Other ..... 96 (Specify)	

No.	Questions and filters	Coding categories	Skip
119	What ethnic group do you belong to?	Vietnamese ..... 01 tay ..... 02 thai ..... 03 Chinese ..... 04 Khmer ..... 05 muong ..... 06 nung ..... 07 hre ..... 08 Phu la ..... 10 E de ..... 11 Dao ..... 12 Co tu ..... 13 Cham ..... 14 Other ..... 96 (Specify)	
120	Check Q.4 in the household Questionnaire: The woman interviewed is not a usual resident ☐	The woman interviewed is a usual resident ☐	→ 201
121	Now I would like to ask about the place in which you usually live. What is the name of the place in which you usually live? (name of place) Is that a city, town, or in the countryside?	Large city ..... 1 Small city ..... 2 Town ..... 3 Countryside 4	
122	In which province is that located? (Name of province/municipality)	Province/municipality ..... ☐☐	
123	Now I would like to ask about the household in which you usually live. What is the main source of drinking water for members of your household?	Piped into residence/Plot ..... 11 → 125 Piped to public tap ..... 12 Well in residence/plot ..... 21 → 125 Public well ..... 22 Spring ..... 31 River/stream ..... 32 Pond/lake ..... 33 Dam ..... 34 Rain water ..... 41 → Tanker truck ..... 51 → 125 Bottled water ..... 61 → Other ..... 96 → 125 (Specify)	

No.	Questions and filters	Coding categories	Skip
124	How long does it take to go there, get water, and come back?	Minutes ☐☐☐	
125	What kind of toilet facility does your household have?	Flush toilet Own 11 Shared 12 Traditional pit toilet/latrine 21 Ventilated improved pit toilet/lar. 22 No facility/bush/field 31 Other 96 (Specify)	
126	Does your household have: Electricity? A radio? A television? A telephone? A refrigerator? A sewing machine? A washing machine?	yes / no Electricity 1 2 Radio 1 2 television 1 2 Telephone 1 2 Refrigerator 1 2 sewing machine 1 2 Washing machine 1 2	
126A	How many rooms in your household are used for sleeping?	Number of rooms ☐☐	
127	Could you describe the main material of the floor of your home?	Earth/sand 11 Rough wood/bamboo 21 Finished floor (polished wood/ ceramic tiles/stone/ETc) 31 Other 96 (Specify)	
127A	Could you describe the main material of the roof of your home?	Concrete 1 Tile/fibro/asbestos 2 Galvanized iron/aluminum/tin 3 Grass/straw 4 Other 6 (Specify)	
128	Does any member of your household own: A bicycle? A motorcycle? A car? A boat? A ploughing machine? A motor scooter?	yes / no Bicycle 1 2 Motorcycle 1 2 Car 1 2 Boat 1 2 Ploughing machine 1 2 Motor scooter 1 2	

Section 2. reproduction

Now I would like to ask you about all the pregnancies that you have had in your lifetime. By this I mean all the children born to you, whether they were born alive or dead, whether still living or not, whether living with you or elsewhere, and all the pregnancies that you have had that did not result in a live birth. I understand that is not easy to talk about children who have died, or pregnancies that have terminated before full term, but it is extremely important that you tell us about all of them, so that we can develop programs that will help the Government of Vietnam improve children's health in the future.

No.	questions and filters	Coding categories	Skip
201	First 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 survived only a few hours or days?	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	Women sometimes have pregnancies that do not result in a live born child. That is, a pregnancy can end early, in an induced abortion or through menstrual regulation. A pregnancy may also end in a miscarriage or a stillbirth. Have you had any such pregnancy that did not result in a live birth?	Yes ..... 1 No 2	→ 210
209	In all, how many such pregnancies have there been?	Pregnancy losses ..... ☐☐	
210	Sum answers to 203, 205, 207 and 209, and enter total If none, record '00'	Total ..... ☐☐	
211	Check 210: Just to make sure that I have this right: you have had in TOTAL pregnancies during you life. Is that correct? YES ☐ No ☐ → Probe and correct 201-210 as necessary		
212	Check 210: One or more pregnancies ☐	No pregnancies ☐	→ 229

213	Now I would like to ask you about all of your pregnancies, whether born alive, born dead, or lost before full term, starting with your most recent live birth or terminated pregnancy. Record all the pregnancies. Record twins and triplets on separate lines.

No.	questions and filters	Coding categories	Skip
225	Compare 210 with number of pregnancies in history above and mark: Numbers are same ☐ numbers are diffirent ☐ → (Probe and reconcile) Check: for each pregnancy: year of birth is recorded in 214 ☐ For each pregnancy loss: duration is recorded in 217 ☐ For each living child: current age is recorded in 221 ☐ For each dead child: age at death is recorded in 222 ☐ For age at death 12 months or 1 year: probe to determine exact number of months ☐		
226	Check 214 and 216, and enter the number of live births since january 1999 ☐ If none, record '0'		
227	For each live birth since january 1997 enter "B" in the month of birth in column 1 of the calendar and "P" in each of the 8 preceding months. Write the name to the left of the "b" code.		
228	For each non-live birth since 1997, enter "T" in the month of pregnancy termination in column 1 of the calendar and "P" in each preceding month of pregnancy.		
229	Check 106A: currently married ☐ Widowed Divorced Separated ☐ →		233
230	Are you pregnant?	Yes ..... 1 No ..... 2 Unsure ..... 8 →	233
231	How many months pregnant are you? Record number of completed months. Enter "P" in column 1 of calendar, beginning with the month of interview and for total number of completed months	Months ..... ☐☐	
232	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 become pregnant at all?	Then ..... 1 Later ..... 2 Not at all 3	
233	When did your last menstrual period start? _____ (Date, if given)	Days ago ..... 1 ☐☐ Weeks ago ..... 2 ☐☐ Months ago ..... 3 ☐☐ Years ago ..... 4 ☐☐ In menopause ..... 994 Before last birth ..... 995 Never menstruated 996	
234	Between the first day of a woman's period and the first day of her next period, are there certain times when she has a greater chance of becoming pregnant than other times?	Yes ..... 1 No ..... 2 Don't know ..... 8 →	301
235	During which times of the monthly cycle does a woman have the greatest chance of becoming pregnant?	During her period ..... 01 Right after her period has ended ..... 02 In the middle of the cycle ..... 03 Just before her period begins ..... 04 Other ..... 96 _____ (Specify) Don't know 98	

Line no.	214	215	216	217	218	219	220	If born alive and still living: 221	221A	If born alive but now dead: 222	223	224
	Think back to the time of your (last/ next to last/etc.) pregnancy. In what month and year did that pregnancy end? Probe: In what season did the pregnancy end?	Was that a single or multiple pregnancy ?	Did that pregnancy end in a live birth, an induced abortion, menstrual regulation, a miscarriage or a stillbirth?	How many months did the preg. last? Record in completed months. Record '00' if less than one full month.	What was the name given to that child?	Is [name] a boy or girl?	Is [name] still alive?	How old was [Name] at his/her last birthday? Record age in completed years	Is [Name] living with you?	How old was [Name] when he/she died? If '1 year' probe: How many months old was [Name]? Record days if under 1 month; months if under 2 years; or years.	From the year of termination of the pregnancy listed above subtract the year of termination of this pregnancy. Is the difference 3 or more years?	Probe: Were there any other pregnancies between this pregnancy and the previous pregnancy you told me about?
01	Month ..... Year	Single ..... 1 Mult. 2	Live birth ..... 1 218 Ind. abor. ..... 2 Mens. regu. ..... 3 Miscarriage ..... 4 Stillbirth 5	(next preg.)	(Name)	Boy .... 1 Girl 2	Y 1 N 2 222	Age in years	Yes ..... 1 No ..... 2 (Next pregnancy)	Days ..... 1 Months... 2 Years 3		
02	Month ..... Year	Single ..... 1 Mult. 2	Live birth ..... 1 218 Ind. abor. ..... 2 Mens. regu. ..... 3 Miscarriage ..... 4 Stillbirth 5	223	(Name)	Boy .... 1 Girl 2	Y 1 N 2 222	Age in years	Yes ..... 1 No 2 223	Days ..... 1 Months... 2 Years 3	Yes ..... 1 No ..... 2 (Next pregnancy)	Yes ..... 1 No 2
03	Month ..... Year	Single ..... 1 Mult. 2	Live birth ..... 1 218 Ind. abor. ..... 2 Mens. regu. ..... 3 Miscarriage ..... 4 Stillbirth 5	223	(Name)	Boy .... 1 Girl 2	Y 1 N 2 222	Age in years	Yes ..... 1 No 2 223	Days ..... 1 Months... 2 Years 3	Yes ..... 1 No ..... 2 (Next pregnancy)	Yes ..... 1 No 2
04	Month ..... Year	Single ..... 1 Mult. 2	Live birth ..... 1 218 Ind. abor. ..... 2 Mens. regu. ..... 3 Miscarriage ..... 4 Stillbirth 5	223	(Name)	Boy .... 1 Girl 2	Y 1 N 2 222	Age in years	Yes ..... 1 No 2 223	Days ..... 1 Months... 2 Years 3	Yes ..... 1 No ..... 2 (Next pregnancy)	Yes ..... 1 No 2
05	Month ..... Year	Single ..... 1 Mult. 2	Live birth ..... 1 218 Ind. abor. ..... 2 Mens. regu. ..... 3 Miscarriage ..... 4 Stillbirth 5	223	(Name)	Boy .... 1 Girl 2	Y 1 N 2 222	Age in years	Yes ..... 1 No 2 223	Days ..... 1 Months... 2 Years 3	Yes ..... 1 No ..... 2 (Next pregnancy)	Yes ..... 1 No 2

Line	214	215	216	217	218	219	220	If born alive and still living: 221	If born alive and still living: 221A	If born alive but now dead: 222	223	224
	Think back to the time of your (last/ next to last/etc.) pregnancy. In what month and year did that pregnancy end? Probe: In what season did the pregnancy end?	Was that a single or multiple pregnancy ?	Did that pregnancy end in a live birth, an induced abortion, menstrual regulation, a miscarriage or a stillbirth?	How many months did the preg. last? Record in completed months. Record '00' if less than one full month.	What was the name given to that child?	Is [name] a boy or girl?	Is [name] still alive?	How old was [Name] at his/her last birthday? Record age in completed years	Is [Name] living with you?	How old was [Name] when he/she died? If '1 year' probe: How many months old was [Name]? Record days if under 1 month; months if under 2 years; or years.	From the year of termination of the pregnancy listed above subtract the year of termination of this pregnancy. Is the difference 3 or more years?	Probe: Were there any other pregnancies between this pregnancy and the previous pregnancy you told me about?
06	Month ..... Year	Single ..... 1 Mult. 2	Live birth ..... 1 218 Ind. abor. ..... 2 Mens. regu. ..... 3 Miscarriage ..... 4 Stillbirth 5	223	(Name)	Boy .... 1 Girl 2	y n 1 2 222	age in years	Yes ..... 1 No 2 223	Days ..... 1 Months... 2 Years 3	Yes ..... 1 No ..... 2 (Next pregnancy)	Yes ..... 1 No 2
07	Month ..... Year	Single ..... 1 Mult. 2	Live birth ..... 1 218 Ind. abor. ..... 2 Mens. regu. ..... 3 Miscarriage ..... 4 Stillbirth 5	223	(Name)	Boy .... 1 Girl 2	Y N 1 2 222	Age in years	Yes ..... 1 No 2 223	Days ..... 1 Months... 2 Years 3	Yes ..... 1 No ..... 2 (Next pregnancy)	Yes ..... 1 No 2
08	Month ..... Year	Single ..... 1 Mult. 2	Live birth ..... 1 218 Ind. abor. ..... 2 Mens. regu. ..... 3 Miscarriage ..... 4 Stillbirth 5	223	(Name)	Boy .... 1 Girl 2	Y N 1 2 222	Age in years	Yes ..... 1 No 2 223	Days ..... 1 Months... 2 Years 3	Yes ..... 1 No ..... 2 (Next pregnancy)	Yes ..... 1 No 2
09	Month ..... Year	Single ..... 1 Mult. 2	Live birth ..... 1 218 Ind. abor. ..... 2 Mens. regu. ..... 3 Miscarriage ..... 4 Stillbirth 5	223	(Name)	Boy .... 1 Girl 2	Y N 1 2 222	Age in years	Yes ..... 1 No 2 223	Days ..... 1 Months... 2 Years 3	Yes ..... 1 No ..... 2 (Next pregnancy)	Yes ..... 1 No 2
10	Month ..... Year	Single ..... 1 Mult. 2	Live birth ..... 1 218 Ind. abor. ..... 2 Mens. regu. ..... 3 Miscarriage ..... 4 Stillbirth 5	223	(Name)	Boy .... 1 Girl 2	Y N 1 2 222	Age in years	Yes ..... 1 No 2 223	Days ..... 1 Months... 2 Years 3	Yes ..... 1 No ..... 2 (Next pregnancy)	Yes ..... 1 No 2

Line	214	215	216	217	218	219	220	If born alive and still living: 221	If born alive and still living: 221A	If born alive but now dead: 222	223	224
	Think back to the time of your (last/ next to last/etc.) pregnancy. In what month and year did that pregnancy end? Probe: In what season did the pregnancy end?	Was that a single or multiple pregnancy ?	Did that pregnancy end in a live birth, an induced abortion, menstrual regulation, a miscarriage or a stillbirth?	How many months did the preg. last? Record in completed months. Record '00' if less than one full month.	What was the name given to that child?	Is [name] a boy or girl?	Is [name] still alive?	How old was [Name] at his/her last birthday? Record age in completed years	Is [Name] living with you?	How old was [Name] when he/she died? If '1 year' probe: How many months old was [Name]? Record days if under 1 month; months if under 2 years; or years.	From the year of termination of the pregnancy listed above subtract the year of termination of this pregnancy. Is the difference 3 or more years?	Probe: Were there any other pregnancies between this pregnancy and the previous pregnancy you told me about?
06	Month ..... Year	Single ..... 1 Mult. 2	Live birth ..... 1 → 218 Ind. abor. ..... 2 Mens. regu. ..... 3 Miscarriage ..... 4 Stillbirth 5	→ 223	(Name)	Boy .... 1 Girl 2	y n 1 2 → 222	age in years	Yes ..... 1 No ..... 2 → 223	Days ..... 1 Months... 2 Years 3	Yes ..... 1 No ..... 2 → (Next pregnancy)	Yes ..... 1 No 2
07	Month ..... Year	Single ..... 1 Mult. 2	Live birth ..... 1 → 218 Ind. abor. ..... 2 Mens. regu. ..... 3 Miscarriage ..... 4 Stillbirth 5	→ 223	(Name)	Boy .... 1 Girl 2	Y N 1 2 → 222	Age in years	Yes ..... 1 No ..... 2 → 223	Days ..... 1 Months... 2 Years 3	Yes ..... 1 No ..... 2 → (Next pregnancy)	Yes ..... 1 No 2
08	Month ..... Year	Single ..... 1 Mult. 2	Live birth ..... 1 → 218 Ind. abor. ..... 2 Mens. regu. ..... 3 Miscarriage ..... 4 Stillbirth 5	→ 223	(Name)	Boy .... 1 Girl 2	Y N 1 2 → 222	Age in years	Yes ..... 1 No ..... 2 → 223	Days ..... 1 Months... 2 Years 3	Yes ..... 1 No ..... 2 → (Next pregnancy)	Yes ..... 1 No 2
09	Month ..... Year	Single ..... 1 Mult. 2	Live birth ..... 1 → 218 Ind. abor. ..... 2 Mens. regu. ..... 3 Miscarriage ..... 4 Stillbirth 5	→ 223	(Name)	Boy .... 1 Girl 2	Y N 1 2 → 222	Age in years	Yes ..... 1 No ..... 2 → 223	Days ..... 1 Months... 2 Years 3	Yes ..... 1 No ..... 2 → (Next pregnancy)	Yes ..... 1 No 2
10	Month ..... Year	Single ..... 1 Mult. 2	Live birth ..... 1 → 218 Ind. abor. ..... 2 Mens. regu. ..... 3 Miscarriage ..... 4 Stillbirth 5	→ 223	(Name)	Boy .... 1 Girl 2	Y N 1 2 → 222	Age in years	Yes ..... 1 No ..... 2 → 223	Days ..... 1 Months... 2 Years 3	Yes ..... 1 No ..... 2 → (Next pregnancy)	Yes ..... 1 No 2

Section 3. Contraception

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.

Circle code 1 in 301 for each method mentioned spontaneously.
Then proceed down column 302, reading the name and description of each method not mentioned spontaneously. Circle code 2 if method is recognized, and code 3 if not recognized.
Then, for each method with code 1 or 2 circled in 301 or 302, ask 303.

301 Which ways or methods have you heard about?		302 Have you ever heard of [method]?			303 Have you ever used [Method]?
		Spontaneous yes	Probed yes	No	
01	Pill. Women can take a pill every day.	1	2	3	Yes ... 1 No ... 2
02	IUD. Women can have a loop or coil placed inside them by a doctor or a nurse.	1	2	3	Yes ... 1 No ... 2
03	Injections. Women can have an injection by a doctor or nurse which stops them from becoming pregnant for several months.	1	2	3	Yes ... 1 No ... 2
04	Implants. Women can have several small rods placed in their upper arm by a doctor or nurse which can prevent pregnancy for several years.	1	2	3	Yes ... 1 No ... 2
05	Diaphragm, foam, jelly. Women can place a sponge, suppository, diaphragm, jelly, or cream inside themselves before intercourse.	1	2	3	Yes ... 1 No ... 2
06	Condom. men can put a rubber sheath on their penis during sexual intercourse.	1	2	3	Yes ... 1 No ... 2
07	Female sterilization. Women can have an operation to avoid having any more children.	1	2	3	Have you ever had an operation to avoid having any more children? Yes ... 1 No ... 2
08	Male sterilization. Men can have an operation to avoid having any more children.	1	2	3	Have you ever had a partner who had an operation to avoid having children? Yes ... 1 No ... 2
09	Rhythm, periodic abstinence. Every month that a woman is sexually active she can avoid having sexual intercourse on the days of the month she is most likely to get pregnant.	1	2	3	Yes ... 1 No ... 2
10	Withdrawal. Men can be careful and pull out before climax.	1	2	3	Yes ... 1 No ... 2
11	Have you heard of any other ways or methods that women or men can use to avoid pregnancy?	1		3	Yes ... 1 No ... 2

avoid pregnancy?	(Specify) (Specify)	Yes ..... 1 No 2

No.	Questions and filters	Coding categories	Skip
304	Check 303: Not a single 'yes' (never used) ☐	At least one 'yes' (ever used) ☐ →	308
305	Have you ever used anything or tried in any way to delay or avoid getting pregnant?	Yes ..... 1 No ..... 2 →	307
306	Enter '0' in column 1 of calendar in each blank month →		330
307	What have you used or done? Correct 303 and 304 (and 302 if necessary)		
308	Now I would like to ask you about the first time that you did something or used a method to avoid getting pregnant. What was the first method you ever used?	Pill ..... 01 IUD ..... 02 Injections ..... 03 Implants ..... 04 Diaphragm/foam/jelly ..... 05 Condom ..... 06 Female sterilization ..... 07 Male sterilization ..... 08 Periodic abstinence ..... 09 Withdrawal ..... 10 Other ..... 96 (Specify)	
309	How many living children did you have at that time, if any? If none, record '00'	Number of children ..... ☐☐	
310	Check 106A: Currently married ☐	Widowed Divorced Separated ☐ →	337
311	Check 303: Woman not sterilized ☐	Woman Sterilized ☐ →	314A
312	Check 230: Not pregnant Or unsure ☐	Pregnant ☐ →	325
313	Are you currently doing something or using any method to delay or avoid getting pregnant?	Yes ..... 1 No ..... 2 →	325
314	Which method are you using?	Pill ..... 01 IUD ..... 02 Injections ..... 03 Implants ..... 04 Diaphragm/foam/jelly ..... 05 Condom ..... 06 Female sterilization ..... 07 Male sterilization ..... 08 Periodic abstinence ..... 09 Withdrawal ..... 10 Other ..... 96 (Specify)	324 318 323 324
314A	Circle '07' for female sterilization		

No.	Questions and filters	Coding categories	Skip
317	How much does one packet (cycle) of pills cost you?	Cost (Dong) ..... ☐☐☐☐☐ Free ..... 99996 Don't know 99998	→ 324
318	Where did the sterilization take place? If source is hospital or clinic, write the name of the place. Probe to identify the type of source and circle the appropriate code. _____ (Name of place)	Public sector Government hospital ..... 10 Delivery house ..... 11 Commune health center ..... 12 Family planning center ..... 13 Mobile clinic ..... 14 Other public ..... 16 _____ (Specify) Private medical sector Private hospital/clinic ..... 21 Private doctor ..... 23 Other private medical ..... 26 Other ..... 96 _____ (Specify) Don't know 98	→ 319 → 319 319
318A	How long does it take to travel from your house to this place? If less than 2 hours, record minutes. Otherwise, record hours.	Minutes ..... 1 ☐☐☐ Hours ..... 2 0☐☐ Don't know 9998	
318B	Is it easy or difficult to get there?	Easy ..... 1 Difficult 2	
319	Do you regret (you/your husband) had the operation not to have any (more) children?	Yes ..... 1 No 2	→ 321
320	Why do you regret the operation?	Respondent wants another child ..... 01 Husband wants another child ..... 02 Side effects ..... 03 Child died ..... 04 Other ..... 96 _____ (Specify)	
321	In what month and year was the sterilization performed?	Month ..... ☐☐ Year ..... ☐☐☐☐	
322	Check 321: Sterilized before January 1997 ☐ → Enter code for sterilization in month of interview in column 1 of the calendar and each month back to January 1997. Then skip to 334 Sterilized in or After January 1997 ☐ → Enter code for sterilization in month of interview in column 1 of the calendar and in each month back to the date of the operation. Then skip to 325		

No.	Questions and filters	Coding categories	Skip
323	How do you determine which days of your monthly cycle not to have sexual relations?	Based on calendar ..... 01 Based on body temperature ..... 02 based on cervical mucus ..... 03 Based on body temperature And cervical mucus ..... 04 No specific system ..... 05 Other ..... 96 (Specify)	
324	Enter method code from 314 in current month in column 1 of calendar. Then determine when she started using method this time. Enter method code in each month of use. Illustrative questions: + When did you start using continuously? + How long have you been using this method continuously?		
325	I would like to ask you some questions about the times you or your partner may have used a method to avoid getting pregnant during the last few years. Use calendar to probe for earlier periods of use and nonuse, starting with most recent use, back to January 1997. Use name of children, dates of birth, and periods of pregnancy as reference points . In column 1, enter code in each month of method use or '0' for nonuse. Illustrative questions: Column 1: + When was the last time you use a method? Which method was that? + When did you start using that method? How long after the birth of [NAME]? + How long did you use the method then? In column 2, enter codes for discontinuation next to last month of use. Number of codes in column 2 must be same as number of interruptions of method use in column 1. Ask why she stopped using the method. If a pregnancy followed, ask whether she became pregnant uniitentionally while using the method or deliberately stopped using to get pregnant. Illustrative questions: Column 2: + Why did you stop using the [Method]? + Did you become pregnant while using [Method], or did you stop to get pregnant, or did you stop for some other reason? If deliberately stopped to become pregnant, ask: How many months did it take you to get pregnant after you stopped using [METHOD]? And enter '0' in each such month in column 1.		
327	Check 314: Circle method code	Not asked ..... 00 → 330 Pill ..... 01 IUD ..... 02 Injections ..... 03 Implants ..... 04 Diaphragm/foam/jelly ..... 05 Condom ..... 06 Female sterilization ..... 07 → 334 Male sterilization ..... 08 → 334 Periodic abstinence ..... 09 Withdrawal ..... 10 → 332 Other method ..... 96 → 332	

No.	Questions and filters	Coding categories	Skip
328	**Where did you obtain [Method] the last time?** If source is hospital or clinic, write the name of the place. Probe to identify the type of source and circle the appropriate code. _____ (Name of place)	Public sector Government hospital ... 10 Delivery house ... 11 Commune health center ... 12 Family planning center ... 13 Mobile clinic ... 14 Field worker ... 15 → 334 Other public ... 16 _____ (Specify) Private medical sector Private hospital/clinic ... 21 Pharmacy ... 22 Private doctor ... 23 Other private medical ... 26 _____ (Specify) Other source Friends/relatives ... 33 → 334 Other ... 36 _____ (Specify)	
328A	**How long does it take to travel from your house to this place?** If less than 2 hours, record minutes. Otherwise, record hours.	Minutes ... 1 ☐☐☐ Hours ... 2 0☐☐ Don't know ... 9998	
328B	**Is it easy or difficult to get there?**	Easy ... 1 Difficult ... 2 → 334	
330	Check 230: Not pregnant Or unsure ☐	Pregnant ☐ → 334	
330A	Check 106A: Currently married ☐	Widowed Divorced Separated ☐ → 337	
331	**What is the main reason you are not using a method of contraception to avoid pregnancy?**	Fertility-relative reasons Not having sex ... 21 Infrequent sex ... 22 Menopausal/hysterectomy ... 23 Sub-fecund/Infecund ... 24 Postpartum/Breastfeeding ... 25 Wants (more) children ... 26 Opposition to use Respondent opposed ... 31 Husband opposed ... 32 Others opposed ... 33 Religious prohibition ... 34 Lack of knowledge Knows no method ... 41 Knows no source ... 42 → 334 Method-relative reasons Heath concerns ... 51 Fear of side effects ... 52 Lack of access/too far ... 53 Cost to much ... 54 inconvenient to use ... 55 Interferes with body's natural processes ... 56 Other ... 96 _____ (Specify) Don't know ... 98	

No.	Questions and filters	Coding categories	Skip
332	Do you know of a place where you can obtain a method of family planning?	Yes ..... 1 No ..... 2 → 334	
333	Where is that? If source is hospital or clinic, write the name of the place. Probe to identify the type of source and circle the appropriate code. _____ (Name of place)	Public sector Government hospital ..... 10 Delivery house ..... 11 Commune heath center ..... 12 Family planning center ..... 13 Mobile clinic ..... 14 Field worker ..... 15 Other public ..... 16 _____ (Specify) Private medical sector Private hospital/clinic ..... 21 Pharmacy ..... 22 Private doctor ..... 23 Other private medical ..... 26 _____ (Specify) Other source Friends/relatives ..... 33 Other ..... 36 _____ (Specify)	
333A	How long does it take to travel from your house to this place? If less than 2 hours, record minutes. Otherwise, record hours.	Minutes ..... 1 [ ][ ] Hours ..... 2 [0][ ] Don't know 9998	
333B	Is it easy or difficult to get there?	Easy ..... 1 Difficult 2	
334	Were you visited by a family planning program worker in the last 12 months?	Yes ..... 1 No ..... 2 → 335	
334A	Do you feel that the family planning staff treated you with respect?	Yes ..... 1 No 2	
334B	Were you satisfied with the family planning field worker?	Yes ..... 1 No 2	
335	Have you visited a health facility for any reason in the last 12 months?	Yes ..... 1 No ..... 2 → 337	
336	Did any staff member at the health facility speak to you about family planning methods?	Yes ..... 1 NO ..... 2 → 337	
336A	Do you feel that the family planning staff treated you with respect?	Yes ..... 1 No 2	
336B	Were you satisfied with the health worker?	Yes ..... 1 NO 2	
337	Do you think that breastfeeding can affect a woman's chance of becoming pregnant?	Yes ..... 1 No ..... 2 Don't know ..... 8 → 343	
338	Do you think a woman's chance of becoming pregnant is increased or decreased by breastfeeding?	Increased ..... 1 → 343 Decreased ..... 2 Depends ..... 3 Don't know 8	

No.	Questions and filters	Coding categories	Skip
339	Check 216: One or more births ☐	No births ☐	→ 343
340	Have you ever relied on breastfeeding as a method of avoiding pregnancy?	Yes ..... 1 No 2	→ 343
341	Check 230 and 311: Not pregnant or unsure And not sterilized ☐	Either pregnant Or sterilized ☐	→ 343
342	Are you currently relying on breastfeeding to avoid getting pregnant?	Yes ..... 1 No 2	
343	Check 216 and 214: One or more induced Abortions or menstrual Regulations since Jan. 1999 ☐	No induced abortions or menstrual Regulations since Jan. 1999 ☐	→ 401
344	In Q.345, enter the line number of each pregnancy since January 1999 which ended in an induced abortion or menstrual regulation. Ask the questions about all of these pregnancy outcomes beginning with the last one. (If there are more than 2 pregnancy outcomes since 1999, use additional questionnaires). **Now I would like to ask you some questions about pregnancies which ended in an induced abortion or menstrual regulation in the last three years. (We will talk about your most recent [induced abortion/menstrual regulation] first).**		

		Last induced abortion or menstrual regulation	Next-to-last induced abortion or menstrual regulation
345	Enter line number from Q.214	Line number ..... ☐☐	Line number ..... ☐☐
346	At the time you became pregnant with the pregnancy which ended in your [last/next-to-last i.a./m.r.], did you want to become pregnant then, did you want to wait until later, or did you want no (more) children at all?	Then ..... 1 → 348 Later ..... 2 No more ..... 3 → 348	Then ..... 1 → 348 Later ..... 2 No more ..... 3 → 348
347	How much longer would you like to have waited?	Months ..... 1 ☐☐ Years ..... 2 ☐☐ Don't know 998	Months ..... 1 ☐☐ Years ..... 2 ☐☐ Don't know 998
348	At the time you became pregnant, were you using a method of contraception?	Yes ..... 1 No ..... 2 → 350	Yes ..... 1 No ..... 2 → 350
349	Which method were you using?	Pill ..... 01 IUD ..... 02 Injections ..... 03 Implants ..... 04 Diaphragm/foam/jelly ..... 05 Condom ..... 06 Female sterilization ..... 07 Male sterilization ..... 08 Periodic abstinence ..... 09 Withdrawal ..... 10 Other ..... 96 (Specify)	Pill ..... 01 IUD ..... 02 Injections ..... 03 Implants ..... 04 Diaphragm/foam/jelly ..... 05 Condom ..... 06 Female sterilization ..... 07 Male sterilization ..... 08 Periodic abstinence ..... 09 Withdrawal ..... 10 Other ..... 96 (Specify)

350	Can you tell me what procedure was used to terminate the pregnancy?	Dilation and curatage ... 1 Menstrual regulation ... 2 Caesarian section ... 3 Traditional method ... 4 (Specify) Other ... 6 (Specify) Don't know ... 8	Dilation and curatage ... 1 Menstrual regulation ... 2 Caesarian section ... 3 Traditional method ... 4 (Specify) Other ... 6 (Specify) Don't know ... 8
351	Sometimes a women has a health problem after [an i.a/m.r.]. Did you have any health problems afterwards?	Yes ... 1 No ... 2 Don't know ... 8 → 357	Yes ... 1 No ... 2 Don't know ... 8 → 357
352	What health problems did you have: sterility, infection, lack of menstruation, excessive bleeding or another problem? Record all reported problems	Sterility ... a Infection ... b Lack of menstruation ... c Bleeding ... d Pelvic pain ... e Other ... x (Specify) Don't know ... z	Sterility ... a Infection ... b Lack of menstruation ... c Bleeding ... d Pelvic pain ... e Other ... x (Specify) Don't know ... z
353	Did you seek advice or treatment because of these problems?	Yes ... 1 No ... 2 → 357	Yes ... 1 NO ... 2 → 357
354	Where did you seek advice or treatment? Anywhere else? Record all mentioned	Public sector Government hospital ... a Delivery house ... b Comm. health center ... c Comm. health worker ... d Other public ... e (Specify) Private medical sector Pvt. hospital/clinic ... f Private doctor ... g PVT. doctor's assistant ... h Pharmacy ... i Other public ... j (Specify) Other source Shop ... k Trad. practitioner ... l Other ... x (Specify)	Public sector Government hospital ... a Delivery house ... b Comm. health center ... c Comm. health worker ... d Other public ... e (Specify) Private medical sector Pvt. hospital/clinic ... f Private doctor ... g PVT. doctor's assistant ... h Pharmacy ... i Other public ... j (Specify) Other source Shop ... k Trad. practitioner ... l Other ... x (Specify)
355	Because of these problems, did you become an in-patient (stay over night) at any health facility?	Yes ... 1 No ... 2 → 357	Yes ... 1 No ... 2 → 357
356	For how many nights?	Nights ... ☐☐ Don't know ... 98	Nights ... ☐☐ Don't know ... 98
357		Go back to 346 in next column; or, if no more events, go to 401	Go back to 346 in next column; or, if no more events, go to 401

Section 4a. Pregnancy and breastfeeding

401	Check 226: One or more births since January 1999 ☐ No births since January 1999 ☐ → 465		
402	Enter the name, line number, and survival status of each birth since 1/1999 in the table. Ask the questions about all of these births. begin with the last birth. (If there are more than 2 births, use additional questionnaires). - Now I would like to ask you some questions about the health of all your children born in the last three years (We will talk about one child at a time).		
403	Line number from Q.214	Last birth Line number ☐☐	Next-to-last birth Line number ☐☐
404	From Q.218 and Q. 220	Name _____ Alive ☐ Dead ☐	Name _____ Alive ☐ 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 want no (more) children at all?	Then 1 → 407 Later 2 No more 3 → 407	Then 1 → 407 Later 2 No more 3 → 407
406	How much longer would you like to have waited?	Months 1 ☐☐ Years 2 Don't know 998	Months 1 ☐☐ Years 2 Don't know 998
407	When you were pregnant with [Name], did you see anyone for antenatal care for this pregnancy? If yes: Whom did you see? Anyone else? Probe for the type of person and record all persons seen	Health professional Doctor a Doctor's assistant b Midwife c Nurse d Other person Trad. birth attendant e Other x _____ (Specify) No one y → 410	Health professional Doctor a Doctor's assistant b Midwife c Nurse d Other person Trad. birth attendant e Other x _____ (Specify) No one y → 410
408	How many months pregnant were you when you first received antenatal care?	Months ☐☐ Don't know 98	Months ☐☐ Don't know 98
409	How many times did you receive antenatal care during this pregnancy?	Number of times ☐☐ Don't know 98	Number of times ☐☐ Don't know 98
410	When you were pregnant with [Name] were you given an injection in the arm to prevent the baby from getting tetanus, that is, convulsions after birth?	Yes 1 No 2 Don't know 8 → 412	Yes 1 No 2 Don't know 8 → 412
411	During this pregnancy, how many times did you get this injection?	Times ☐ Don't know 8	Times ☐ Don't know 8

No.	Questions	Last Name _____	Next-to-last birth Name _____
412	**Where did you give birth to [Name]?**	Home Your home ... 11 Other home ... 12 Public sector Central hospital ... 21 Provincial hospital ... 22 Dist. hosp./health center ... 23 Comm. Health center ... 24 Delivery house ... 25 Other public ... 26 _____ (Specify) Private medical Pvt. hospital/clinic ... 31 Other private medical ... 36 _____ (Specify) Other ... 96 _____ (Specify)	Home Your home ... 11 Other home ... 12 Public sector Central hospital ... 21 Provincial hospital ... 22 Dist. hosp./health center ... 23 Comm. Health center ... 24 Delivery house ... 25 Other public ... 26 _____ (Specify) Private medical Pvt. hospital/clinic ... 31 Other private medical ... 36 _____ (Specify) Other ... 96 _____ (Specify)
413	**Who assisted with the delivery of [Name]? Anyone else?** Probe for the type of person and record all persons assisting.	Health professional Doctor ... a Doctor's assistant ... b Midwife ... c Nurse ... d Other person Trad. birth attendant ... e Relative/friend ... f Other ... x _____ (Specify) No one ... y	Health professional Doctor ... a Doctor's assistant ... b Midwife ... c Nurse ... d Other person Trad. birth attendant ... e Relative/friend ... f Other ... x _____ (Specify) No one ... y
414	**Around the time of the birth of [Name], did you have any of the following problems:** Long labor, that is, did your regular contractions last more than 12 hours? Excessive bleeding that was so much that you feared it was life threatening? A high fever with bad smelling vaginal discharge? Convulsions not caused by a fever?	y n Labor more than 12 hours ... 1 2 Excessive bleeding ... 1 2 fever/bad smelling Vag. discharge ... 1 2 Convulsions ... 1 2	y n Labor more than 12 hours ... 1 2 Excessive bleeding ... 1 2 fever/bad smelling Vag. discharge ... 1 2 Convulsions ... 1 2
415	**Was [Name] delivered by caesarian section?**	Yes ... 1 No ... 2	Yes ... 1 No ... 2
416	**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
417	**Was [Name] weighed at birth?**	Yes ... 1 No ... 2 → 419	Yes ... 1 No ... 2 → 419

No.	Questions	Last Name _____	Next-to-last birth Name _____
418	How much did [Name] weigh? Record weight from birth notification card, if available.	Grams from card..... 1 Gf recall..... 2 Don't know..... 99998	Gram from Card..... 1 GF recall ..... 2 Don't know 99998
419	Has your period returned since the birth of [Name]?	Yes..... 1 421 No..... 2 423	
420	Did your period return between the birth of [Name] and your next pregnancy?		Yes..... 1 No..... 2 424
421	For how many months after the birth of [Name] did you not have a period?	Months..... Don't know..... 98	Months..... Don't know..... 98
422	Check 230: Respondent pregnant?	Not preg. ☐ pregnant or unsure ☐ 424	
423	Have you resumed sexual relations since the birth of [Name]?	Yes..... 1 No..... 2 425	
424	For how many months after the birth of [Name] did you not have sexual relations?	Months..... Don't know..... 98	Months..... Don't know..... 98
425	Did you ever breastfeed [Name]?	Yes..... 1 No..... 2 431	Yes..... 1 No..... 2 431
426	How long after birth did you first put [Name] to the breast? IF < 1 hour, record '00' hours If < 24 hours, record hours Otherwise, record days	Immediately..... 000 Hours..... 1 Days..... 2	Immediately..... 000 Hours..... 1 Days..... 2
427	Check 404: Child alive?	Alive ☐ Dead ☐ 429	Alive ☐ Dead ☐ 429
428	Are you still breastfeeding [Name]?	Yes..... 1 432 No..... 2	Yes..... 1 432 No..... 2
429	For how many months did you breastfeed [Name]?	Months..... Don't know..... 98	Months..... Don't know..... 98
430	Why did you stop breastfeeding [Name]?	Mother ill/weak..... 01 Child ill/weak..... 02 Child dead..... 03 Nipple/breast problem..... 04 Not enough milk..... 05 Mother working..... 06 Child refused..... 07 Weaning age/age to stop..... 08 Became pregnant..... 09 Started using contraception..... 10 Other..... 96 _____ (Specify)	Mother ill/weak..... 01 Child ill/weak..... 02 Child dead..... 03 Nipple/breast problem..... 04 Not enough milk..... 05 Mother working..... 06 Child refused..... 07 Weaning age/age to stop..... 08 Became pregnant..... 09 Started using contraception..... 10 Other..... 96 _____ (Specify)

No.	Questions	Last Name _____	Next-to-last birth Name _____
431	Check 404: Child alive?	Alive ☐ → 43 Dead ☐ → (Go back to 405 in next column or, if no more births go to 440)	Alive ☐ → 43 Dead ☐ → (Go back to 405 in next column or, if no more births go to 440)
432	How many times did you breastfeed last night between sunset and sunrise? If answer is not numeric probe for approximate number	Number of nighttime feedings..... ☐☐	Number of nighttime feedings ..... ☐☐
433	How many times did you breastfeed yesterday during the daylight hours? If answer is not numeric probe for approximate number	Number of Daylight feedings..... ☐☐	Number of Daylight feedings ..... ☐☐
434	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
435	At any time yesterday or last night, was [Name] given any of the following: Plain water, filtered water or boiled water? Sugar water? Juice? Herbal tea? Baby formula? Tinned or powdered milk? Fresh milk? Any other liquid? Any solid or semi-solid foods?	Y N DK Pain water ..... 1 2 8 Sugar water..... 1 2 8 Juice..... 1 2 8 Herbal tea..... 1 2 8 Baby formula ..... 1 2 8 Tinned/ powdered milk ..... 1 2 8 Fresh milk..... 1 2 8 Other liquids ..... 1 2 8 Solid/semi-solid foods..... 1 2 8	Y N DK Pain water..... 1 2 8 Sugar water..... 1 2 8 Juice..... 1 2 8 Herbal tea ..... 1 2 8 Baby formula..... 1 2 8 Tinned/ powdered milk..... 1 2 8 Fresh milk ..... 1 2 8 Other liquids..... 1 2 8 Solid/semi-solid foods 1 2 8
439		Go back to 405 in next column; or, if no more births, go to 440	Go back to 405 in next column; or, if no more births, go to 440

Section 4B. Immunization and health

440	Enter the name, line number, and survival status of each birth since 1/1999 in the table. Ask the questions about all of these births. begin with the last birth. (If there are more than 2 births, use additional questionnaires).		
441	Line number from Q.214	last birth Line number ..... ☐☐	Next-to-last birth line number ..... ☐☐
442	From Q.218 and Q.220	Name _____ alive ☐ dead ☐ (Go to 442 in next column; or, if no more births, go to 465)	Name _____ alive ☐ dead ☐ (Go to 442 in next column; or, if no more births, go to 465)
443	Do you have a card where [Name's] vaccinations are written down? If yes: May I see it please?	Yes, seen ..... 1 → 445 Yes, not seen ..... 2 → 447 No card 3	Yes, seen ..... 1 → 445 Yes, not seen ..... 2 → 447 No card 3
444	Did you ever have a vaccination card for [Name]?	Yes ..... 1 No ..... 2 → 447	Yes ..... 1 No ..... 2 → 447
445	(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 If Vaccine was not given, leave the corresponding line blank BCG Polio 1 (P1) Polio 2 (P2) Polio 3 (P3) DPT 1 (D1) DPT 2 (D2) DPT 3 (D3) Measles	Day month year BCG P1 P2 P3 D1 D2 D3 meas.	Day month year BCG P1 P2 P3 D1 D2 D3 Meas.

No.	Questions	Last birth Name _____	Next-to-last birth Name _____
446	Has [Name] received any vaccinations that are not recorded on this card? Record '1' only if respondent mentions BCG, polio 1-3, DPT 1-3 and/or measles vaccine(s)	Yes ..... 1 (Probe for vaccinations and write '66' in the corresponding day column in 445) No ..... 2 Don't know 8 449	Yes ..... 1 (Probe for vaccinations and write '66' in the corresponding day column in 445) No ..... 2 Don't know 8 449
447	Did [Name] ever receive any vaccinations to prevent him/her from getting diseases?	Yes ..... 1 No ..... 2 Don't know 8 449	Yes ..... 1 No ..... 2 Don't know 8 449
448	Please tell me if [Name] received any of the following vaccinations:		
448A	A BCG vaccination against tuberculosis, that is, an injection in the left arm or shoulder that caused a scar?	Yes ..... 1 No ..... 2 Don't know 8	Yes ..... 1 No ..... 2 Don't know 8
448B	Polio vaccine, that is, drops in the mouth?	Yes ..... 1 No ..... 2 Don't know 8 448d	Yes ..... 1 No ..... 2 Don't know 8 448d
448C	How many times?	Number of times ..... ☐	Number of times ..... ☐
448D	DPT vaccination, that is, an injection usually given at the same time as polio drops?	Yes ..... 1 No ..... 2 Don't know 8 448E	Yes ..... 1 No ..... 2 Don't know 8 448E
448E	How many times?	Number of times ..... ☐	Number of times ..... ☐
448F	An injection to prevent measles?	Yes ..... 1 NO ..... 2 Don't know 8	Yes ..... 1 NO ..... 2 Don't know 8
449	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
450	Has [Name] been ill with a cough at any time in the last 2 weeks?	Yes ..... 1 No ..... 2 Don't know 8 454	Yes ..... 1 No ..... 2 Don't know 8 454
451	When [NAME] was ill with a cough, did he/she breathe faster than usual with short, fast breaths ?	Yes ..... 1 No ..... 2 Don't know 8	Yes ..... 1 No ..... 2 Don't know 8
452	Did you seek advice or treatment for the cough?	Yes ..... 1 No 2 454	Yes ..... 1 No 2 454

No.	Questions	Last birth Name _____	Next-to-last birth Name _____
453	Where did you seek advice or treatment? Anywhere else? Record all mentioned	Public sector Government hospital ... a Comm. health center ... b MCH/FP mobile team ... c Village health worker ... d Other public ... E _____ (Specify) Private medical sector PVT. hospital/clinic ... f Private doctor ... g PVT. doctor's assistant ... h Pharmacy ... i Other private medical ... j _____ (Specify) Other source Shop ... k Trad. practitioner ... l Other ... x _____ (Specify)	Public sector Government hospital ... a Comm. health center ... b MCH/FP mobile team ... c Village health worker ... d Other public ... E _____ (Specify) Private medical sector PVT. hospital/clinic ... f Private doctor ... g PVT. doctor's assistant ... h Pharmacy ... i Other private medical ... j _____ (Specify) Other source Shop ... k Trad. practitioner ... l Other ... x _____ (Specify)
454	Has [Name] had diarrhea in the last 2 weeks?	Yes ... 1 NO ... 2 Don't know ... 8 → 464	Yes ... 1 NO ... 2 Don't know ... 8 → 464
455	Was there any blood in the stools?	Yes ... 1 No ... 2 Don't know ... 8	Yes ... 1 No ... 2 Don't know ... 8
456	On the worst day of the diarrhea, how many bowel movements did [Name] have?	Number of bowel movements ... ☐☐ Don't know ... 98	Number of bowel movements ... ☐☐ Don't know ... 98
457	Was he/she given the same amount to drink as before the diarrhea, or more, or less?	Same ... 1 More ... 2 Less ... 3 Don't know ... 8	Same ... 1 More ... 2 Less ... 3 Don't know ... 8
458	Was he/she given the same amount to food to eat as before the diarrhea, or more, or less?	Same ... 1 More ... 2 Less ... 3 Don't know ... 8	Same ... 1 More ... 2 Less ... 3 Don't know ... 8
459	When [Name] had diarrhea, was he/she given any of the following to drink: A fluid, made from a special packet called Oredon? Porridge? Soup? Home-made sugar-salt-water solution? Tannin-rich water? Milk or infant formula? Drinking water? Any other liquid?	Y N DK Fluid from ors pkt ... 1 2 8 Porridge ... 1 2 8 Soup ... 1 2 8 Sugar-salt-water solution ... 1 2 8 Tannin-rich water ... 1 2 8 Milk/ infant form. ... 1 2 8 Water ... 1 2 8 Other liquid ... 1 2 8	Y N DK Fluid from ors pkt ... 1 2 8 Porridge ... 1 2 8 Soup ... 1 2 8 Sugar-salt-water solution ... 1 2 8 Tannin-rich water ... 1 2 8 Milk/ infant form. ... 1 2 8 Water ... 1 2 8 Other liquid ... 1 2 8

No.	Questions	Last birth Name _____	Next-to-last birth Name _____
460	Was anything (else) given to treat the diarrhea?	Yes ..... 1 No ..... 2 Don't know 8 462	Yes ..... 1 No ..... 2 Don't know 8 462
461	What was given to treat the diarrhea? Anything else? Record all mentioned	Pill or syrup ..... b Injection ..... c (I.v.) intravenous ..... d Home remedies/ Herbal medicines ..... e Other ..... x _____ (Specify)	Pill or syrup ..... b Injection ..... c (I.v.) intravenous ..... d Home remedies/ Herbal medicines ..... e Other ..... x _____ (Specify)
462	Did you seek advice or treatment for the diarrhea?	Yes ..... 1 No 2 464	Yes ..... 1 No 2 464
463	Where did you seek advice or treatment? Anywhere else? Record all mentioned	Public sector Government hospital ..... a Comm. health center ..... b MCH/FP mobile team ..... c Village health worker ..... d Other public ..... E _____ (Specify) Private medical sector Pvt. hospital/clinic ..... f Private doctor ..... g PVT. doctor's assistant ..... h Pharmacy ..... i Other private medical ..... j _____ (Specify) Other source Shop ..... k trad. practitioner ..... l Other ..... x _____ (Specify)	Public sector Government hospital ..... a Comm. health center ..... b MCH/FP mobile team ..... c Village health worker ..... d Other public ..... E _____ (Specify) Private medical sector Pvt. hospital/clinic ..... f Private doctor ..... g PVT. doctor's assistant ..... h Pharmacy ..... i Other private medical ..... j _____ (Specify) Other source Shop ..... k trad. practitioner ..... l Other ..... x _____ (Specify)
464		Go back to 442 in next column; or, if no more births, go to 465	Go back to 442 in next column; or, if no more births, go to 465

No.	Questions and filters	Coding categories	Skip
465	When a child has diarrhea, should he/she be given less to drink than usual, about the same amount, or more than usual?	Less to drink ..... 1 About same amount to drink ..... 2 More to drink ..... 3 Don't know 8	
466	When a child has diarrhea, should he/she be given less to eat than usual, about the same amount, or more than usual?	Less to eat ..... 1 About same amount to eat ..... 2 More to eat ..... 3 Don't know 8	
467	When a child is sick with diarrhea, what signs of illness would tell you that he or she should be taken to a health facility or health worker? Record all mentioned	Repeated watery stools ..... a Any watery stools ..... b Repeated vomiting ..... c Any vomiting ..... d Blood in stools ..... e Fever ..... f Marked thirst ..... g Not eating/not drinking well ..... h Getting sicker/very sick ..... i Not getting better ..... j other ..... x _____ (Specify) Don't know ..... z	
468	When a child is sick with a cough, what signs of illness would tell you that he or she should be taken to a health facility or health worker? Record all mentioned	Fast breathing ..... a Difficult breathing ..... b Noisy breathing ..... c Fever ..... d Unable to drink ..... e Not eating/not drinking well ..... f Getting sicker/very sick ..... g Not getting better ..... h Other ..... x _____ (Specify) Don't know ..... z	
469	Check 459, all columns: No child Received ors ☐ Any child Received ors ☐ → 501		
470	Have you ever heard of a special product called Oredon you can use for the treatment of diarrhea?	Yes ..... 1 No 2	

Section 5. Marriage

No.	Questions and filters	Coding categories	Skip
501	Presence of others at this point?	Y n Children under 10 ..... 1 2 Husband ..... 1 2 Other males ..... 1 2 Other females 1 2	
502	Check 106A: Currently married ☐ Widowed / Divorced / Separated ☐ → 511		
507	Is your husband living with you now or is he staying elsewhere?	Living with her ..... 1 Staying elsewhere 2	
511	Have you been married only once, or more than once?	Once ..... 1 More than once 2	
512	Check 511: Married Only once ☐ → In what month and year did you start living with your husband? Married more than once ☐ → Now we will talk about your first husband. In what month and year did you start living with him?	Month ..... ☐☐ Don't know month ..... 98 Year ..... ☐☐☐☐ → 514 Don't know year 9998	
513	How old were you when you started living with him?	Age ..... ☐☐	
514	Determine months married since 1/1997. Enter 'X' in column 3 of calendar for each month married, and enter '0' for each month not married, since 1/1997. For women with more than one marriage: probe for date when current married started and, if appropriate, for starting and termination dates of any previous marriages. For women not currently married: probe for date when last marriage started and for termination date and, if appropriate, for the starting and termination dates of any previous marriages.		
516	Check 301 and 302: Knows Condom ☐ → The last time you had sex, was a condom used? Does not Know condom ☐ → Some men use a condom, which means that they put a rubber sheath on their penis during sexual intercourse. The last time you had sex, was a condom used?	Yes ..... 1 No ..... 2 Don't know 8	

No.	Questions and filters	Coding categories	Skip
517	Do you know of a place where you can get condoms?	Yes ..... 1 No ..... 2 → 600	
518	Where is that? If source is hospital or clinic, write the name of the place. Probe to identify the type of source and circle the appropriate code. _____ (Name of place)	Public sector Government hospital ..... 10 Delivery house ..... 11 Commune health center ..... 12 Family planning center ..... 13 Mobile clinic ..... 14 Field worker ..... 15 Other public ..... 16 _____ (Specify) Private medical sector Private hospital/clinic ..... 21 Pharmacy ..... 22 Private doctor ..... 23 Other private medical ..... 26 _____ (Specify) Other source Friends/relatives ..... 33 Other ..... 36 _____ (Specify)	

Section 6. fertility preference

No.	Questions and filters	Coding categories	Skip
600	Check 106A: Currently married ☐	Widowed / Divorced / Separated ☐	→ 612
601	Check 314: Neither Sterilized ☐	He or she Sterilized ☐	→ 612
602	Check 230: 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 Says she can't get pregnant ..... 3 Undecided/don't know 8	→ 604 → 606 → 604
603	Check 230: Not pregnant Or unsure ☐ — How long would you like to wait from now before the birth of (a/another) child? / Pregnant ☐ — After 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 Says she can't get Pregnant ..... 994 Other ..... 996 (Specify) Don't know 998	→ 606
604	Check 230: Not pregnant Or unsure ☐	Pregnant ☐	→ 607
605	If you became pregnant in the next few weeks, would you be happy, unhappy, or would it not matter very much?	Happy ..... 1 Unhappy ..... 2 Would not matter 3	
606	Check 313: Not Asked ☐ / Not currently Using ☐	Currently Using ☐	→ 612
607	Do you think you will use a method to delay or avoid pregnancy within the next 12 months?	Yes ..... 1 No ..... 2 Don't know 8	→ 609
608	Do you think you will use a method to delay or avoid pregnancy at any time in the future?	Yes ..... 1 No ..... 2 Don't know 8	→ 610

No.	Questions and filters	Coding categories	Skip
609	Which method would you prefer to use?	Pill ..... 01 IUD ..... 02 Injections ..... 03 Implants ..... 04 Diaphragm/foam/jelly ..... 05 Condom ..... 06 Female sterilization ..... 07 Male sterilization ..... 08 Periodic abstinence ..... 09 Withdrawal ..... 10 Other ..... 96 (Specify) Unsure 98	→ 612
610	What is the main reason that you think you will never use a method?	Fertility-related reasons Infrequent sex ..... 22 Menopausal/hysterectomy ..... 23 Sub-fecund/infecund ..... 24 Wants more children ..... 26 Opposition to use Respondent opposed ..... 31 Husband 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 Cost too much ..... 54 Inconvenient to use ..... 55 Interferes with body's normal processes ..... 56 Other ..... 96 (Specify) Don't know 98	
612	Check 220: 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	Number ..... ☐☐ Other ..... 96 (Specify)	→ 614

No.	Questions and filters	Coding categories	Skip
613	How many of these children would you like to be boys, how many would you like to be girls and for how many would it not matter?	Boys ..... ☐☐☐ Girls ..... ☐☐☐ Either ..... ☐☐☐ Other ..... 999996 (Specify)	
614	Would you say that you approve or disapprove of couples using a method to avoid getting pregnant?	Approve ..... 1 Disapprove ..... 2 No opinion 3	
615	Is it acceptable or not acceptable to you for information on family planning to be provided: On the radio? On the television?	accept-able / not acceptable / DK Radio 1 2 8 T.V 1 2 8	
616	In the last few months have you heard (read) about family planning: On the radio? On the television? In a newspaper or magazine? From a poster? From leaflets or brochures?	Yes / no Radio ..... 1 2 Television ..... 1 2 Newspaper or magazine ..... 1 2 Poster ..... 1 2 Leaflets or brochures 1 2	
618	In the last few months have you discussed the practice of family planning with your friends, neighbors, or relatives?	Yes ..... 1 No 2	→ 620
619	With whom? Anyone else? Record all mentioned	Husband ..... a Mother ..... b Father ..... c Sister(s) ..... d Brother(s) ..... e Daughter ..... f Mother-in-law ..... g Friends/neighbors ..... h Other ..... x (Specify)	
620	Check 106A: Currently married ☐ ↓ Widowed divorced Separated ☐		→ 701
621	Spouses do not always agree on everything. Now I want to ask you about your husband's views on family planning. Do you think that your husband approves or disapproves of couples using a method to avoid pregnancy?	Approves ..... 1 Disapproves ..... 2 Don't know 8	
622	How often have you talked to your husband about family planning in the past year?	Never ..... 1 Once or twice ..... 2 More often 3	
623	Do you think your husband wants the same number of children that you want, or does he want more or fewer than you want?	Same number ..... 1 More children ..... 2 Fewer children ..... 3 Don't know 8	

Section 7. Husband background, woman's work and residence

No.	Questions and filters	Coding categories	Skip
701	Check 106A: Currently married ☐	Widowed Divorced Separated ☐	→ 703
702	How old was your husband on his last birthday?	Age ☐☐	
703	Did your (last) husband ever attend school?	Yes ... 1 No ... 2	→ 706
704	What was the highest grade of education he completed? Use equivalency table	Grade ☐☐ College/university ... 15 Don't know grade ... 98	
706	What (is/was) your (last) husband's occupation? That is, what kind of work (does/did) he mainly do?	_____ ☐☐ _____ (Specify)	
709	Aside from your own housework, are you currently working?	Yes ... 1 No ... 2	→ 712
710	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? Are you currently doing any of these things or any other work?	Yes ... 1 No ... 2	→ 712
711	Have you done any work in the last 12 months?	Yes ... 1 No ... 2	→ 726
712	What is your occupation, that is, what kind of work do you mainly do?	_____ ☐☐ _____ (Specify)	
715	Do you do this work for a family member, a cooperative, the government, someone else, or are you self-employed?	A family member ... 1 A cooperative ... 2 The government ... 3 Someone else ... 4 Self-employed ... 5	
717	During the last 12 months, how many months did you work?	Number of months ☐☐	
720	Do you earn cash for your work? Probe: Do you make money for working?	Yes ... 1 No ... 2	→ 723

No.	Questions and filters	Coding categories	Skip
722	Check 106a: Currently Married ☐ → Who mainly decides how the money you earn will be used: you, your husband, you and your husband jointly, or someone else? Widowed/ Divorced Separated ☐ → Who mainly decides how the money you earn will be used: you, someone else, or you and someone else jointly?	Respondent decides ..... 1 Husband decides ..... 2 Jointly with husband ..... 3 Someone else decides ..... 4 Jointly with someone else 5	
723	Do you usually work at home or away from home?	Home ..... 1 Away 2	
724	Check 221 and 221A: Is a child living at home who is less than age 6 years? Yes ☐ ↓ No ☐ →		726
725	Who usually takes care of [Name of youngest child at home] while you are working?	Respondent ..... 01 Husband ..... 02 Older female child ..... 03 Older male child ..... 04 Other relative ..... 05 Neighbor ..... 06 Friend ..... 07 Servant/hired help ..... 08 Child is in school ..... 09 Institutional child care ..... 10 Has not worked Since last birth ..... 95 Other ..... 96 _____ (Specify)	
726	Have you lived in only one community or in more than one community since Jan. 1997?	One community ..... 1 More than one community ..... 2 →	728
727	In column 4 of calendar, enter the appropriate code for current community, ('1' city, '2' town, '3' countryside). Begin in the month of interview and continue with all preceding months back to 1/1997. Then skip to →		801
728	In what month and year did you move to [name of current community]? In column 4 of calendar, enter 'x' in the month and year of the move. In subsequent months enter the appropriate code for the type of community, ('1' city, '2' town, '3' countryside). Continue probing for previous communities, and record moves and type of communities accordingly. Illustrative questions: • Where did you live before .....? • In what month and year did you arrive there? • Is that place a city, a town, or in the countryside?		

Section 8. AIDS

No.	Questions and filters	Coding categories	Skip
801	Have you ever heard of an illness called AIDS?	Yes ..... 1 No ..... 2 → 811	
802	From which sources of information have you learned most about AIDS? Any other sources? Record all mentioned	Radio ..... a Television ..... b Newspapers/magazines ..... c Pamphlets/posters ..... d Health workers ..... e Churches/temples ..... f Schools/teachers ..... g Community meetings ..... h Friends/relatives ..... i Work place ..... j Other ..... x _____ (Specify)	
803	Is there anything a person can do to avoid getting AIDS or the virus that causes AIDS?	Yes ..... 1 No ..... 2 Don't know ..... 8 → 807	
804	What can a person do? Any other ways? Record all mentioned	Safe sex ..... a Abstain from sex ..... b Use condoms ..... c Have only one sex partner ..... d Avoid sex with prostitutes ..... e Avoid sex with homosexuals ..... f Avoid blood transfusions ..... g Avoid injections ..... h Avoid kissing ..... i Avoid mosquito bites ..... j Seek protection from traditional healer ..... k Other ..... w _____ (Specify) Other ..... x _____ (Specify) Don't know ..... z	
805	Check 804: Mentioned Safe sex ☐ ↓ Did not mention Safe sex ☐ → 807		

No.	Questions and filters	Coding categories	Skip
806	What does "safe sex" mean to you? Record all mentioned	Abstain from sex ..... b Use condoms ..... c Have only one sex partner ..... d Avoid sex with prostitutes ..... e Avoid sex with homosexuals ..... f Other ..... x _____ (Specify) Don't know ..... z	
807	Is it possible for a healthy-looking person to have the AIDS virus?	yes ..... 1 No ..... 2 Don't know 8	
808	Do you think that persons with AIDS almost never die from the disease, sometimes die, or almost always die from the disease?	Almost never ..... 1 Sometimes ..... 2 Almost always ..... 3 Don't know 8	
809	Do you think your chances of getting AIDS are small, moderate, great, or no risk at all?	Small ..... 1 Moderate ..... 2 Great ..... 3 No risk at all ..... 4 Has aids 5	
811	Record the time	Hour ..... minutes	

Interviewer's observations
(To be filled in after completing interview)

Comments about Respondent:

Comment on Specific Questions:

Any other comments:

Supervisor's observations

Name of Supervisor: Date:

Editor's observations

Name of Editor: Date: