School of Public Health

Factors that influence the utilization of maternity services and breastfeeding practices in rural Vietnam

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Declaration

This thesis contains no material which has been accepted for the award of any other degree or diploma in any university.

To the best of my knowledge and belief this thesis contains no materials previously published by any other person except where due acknowledgement has been made.

Signature:

Date: 10 April 2005

Acknowledgements

Abstract

The overall objective of this thesis is to investigate factors that influence the utilization of maternal services, infant feeding and postpartum contraception practices in rural Vietnam. Field studies were carried out in a rural district of Thanh Hoa, a province located in North Central Vietnam.

Willingness-to-pay for maternal preferences was measured in a sample of 200 postpartum and 196 pregnant women, as well as 196 men using the payment card technique. An association was found between satisfaction with the quality of maternal services and willingness-to-pay. There were no significant differences in willingness-to-pay values between prenatal and postpartum groups, and between male and female subjects.

The feasibility, reliability and validity of a 20-item scale for measuring perceived quality of maternal services provided at commune health centres, were examined based on a sample of 200 postpartum and 196 pregnant women. The instrument was found to have good inter-rater reliability and internal consistency. Maternal status of clients (prenatal vs. postnatal) was found to influence the perceived quality of maternal services.

Determinants of the utilization of maternal services at the primary health care level were investigated in a sample of 200 postpartum women together with sixteen focus group discussions and 16 in-depth interviews. The results showed that client-perceived quality of services and socio-cultural, and economic factors, rather than geographical access, could affect the utilization of maternal services.

Factors affecting infant feeding practices were measured in a longitudinal study of 463 women at weeks one, 16 and 24 postpartum. Within the first week after delivery, the initiation and exclusive breastfeeding rates were relatively high at 98.3% and 83.6% respectively, but the premature introduction of complementary food was a great concern. Exclusive breastfeeding dropped from 83.6% at week one to 43.6% at week 16, and by week 24, no infant was exclusively breastfed. Home-cooked solid

food was introduced by 4.8%, 40.9% and 74.3% at weeks one, 16 and 24, respectively. Logistic regression analysis showed that, together with socio-cultural determinants, factors related to the mother, such as education level and occupation, and infant related factors could influence the initiation and exclusive breastfeeding within six months postpartum.

The practice of contraceptive use within six months postpartum was also examined in a prospective study of 463 postpartum women. The proportion of contraceptive users at weeks 16 and 24 were 17.4% and 43.4% respectively. At week 24, of contraceptive users, 57.3% used IUD, 25.1% used condom, and 13.6% used traditional methods. Logistic regression analysis found age, sufficient knowledge on contraceptives and husband/partner opinion can significantly affect the contraception decision.

The results of the study indicated that good physical access does not necessarily increase the utilization of maternal services due to institutional, environment and individual barriers. Client-perceived quality of services, socio-cultural and economic factors are important determinants of the utilization of maternal services. In view of the observed low rates of exclusive breastfeeding and contraception, there is a risk of unwanted pregnancy for women within six months postpartum. To improve maternal and child health status, health workers need to be trained in terms of inter-personal communication and counselling skills, and be appropriately supervised by district health authorities. Mobilizing the participation of the community and family, especially men to share the workload with women, would play a crucial role in the improvement of childbirth, contraception and breastfeeding practice.

Key words: determinants, maternal, utilization, willingness-to-pay, perceived quality of services, exclusive breastfeeding, complementary food, postpartum contraception, rural, Vietnam.

Abbreviations

ANC	Antenatal Care
ASE	Attitudes-Social influence-Self efficacy
CHC	Commune Health Centre
CI	Confidence Interval
DH	District Hospital
DHC	District Health Centre
DHS	Demographic and Health Survey
DOH	Department of Health
EBF	Exclusive Breastfeeding
IMR	Infant Mortality Rate
IUD	Intrauterine Device
LAM	Lactational Amenorrhoea Method
LBW	Low Birth Weight
MMR	Maternal Mortality Ratio
MOH	Ministry of Health
NHMRC	National Health and Medical Research Council of Australia
non-EBF	non-Exclusive Breastfeeding
NUD*IST	Nonnumerical Unstructured Data-Indexing Searching and Theorising
OR	Odds Ratio
r	Coefficient of Correlation
SD	Standard Deviation
SPSS	Statistical Package for Social Sciences
TBA	Traditional Birth Attendant
UNDP	United Nations Development Programme
UNFPA	United Nations Population Fund
UNICEF	United Nations Children Fund
VCPFC	Committee for Population, Family, and Children of Vietnam
VND	Vietnamese Dong (local currency)
WHO	World Health Organization
WMA	World Medical Association
WTP	Willingness-to-pay

Definitions

Maternal health encompasses positive or negative outcomes – physical, social or mental, in a woman from any cause related to childbearing or its management. It could be divided into two sub-categories: direct and indirect maternal health. The former consists of health outcomes arising directly from, but not necessarily during, pregnancy, childbirth or the puerperium, owning to natural circumstances or to interventions, omissions, treatment or from a chain of events resulting from any of the above. The latter consists of health outcomes not specific to childbearing but influenced by or influencing direct outcome of childbearing (Graham and Campbell, 1992).

Maternal or *maternity service* in this thesis refers to obstetric delivery service.

Skilled birth attendant refers exclusively to people with midwifery skills (for example, midwives, doctors and nurses) who have been trained to proficiency in the skills necessary to manage normal deliveries and diagnose or refer obstetric complications (WHO, 1999).

Traditional birth attendant (TBA) is a person who assists the mother during childbirth and initially acquired her skills by delivering babies herself or through apprenticeship to other traditional birth attendants (WHO, 1992).

Breastfeeding means the child has received breast milk direct from the breast or expressed (WHO, 1996).

Exclusive breastfeeding is defined as the infant has received only breast milk from the mother or a wet nurse, or expressed breast milk, and no other liquids or solids with the exception of drops or syrups consisting of vitamins, mineral supplements or medicines (WHO, 1996).

Predominant breastfeeding is defined as the infant's predominant source of nourishment has been breast milk. However, the infant may also have received water

and water-based drinks (sweetened and flavoured water, teas, infusions, etc.), fruit juice, oral dehydration salts solution, drop and syrup forms of vitamins, minerals and medicines, and ritual fluids (in limited quantities). With the exception of fruit juice and sugar water, no food-based fluid is allowed under this definition (WHO, 1996).

Full breastfeeding consists of exclusive breastfeeding and predominant breastfeeding (WHO, 1996).

Complementary feeding implies that the child has received liquid or semi-solid food from a bottle with a nipple/teat (WHO, 1996).

Solid food includes all type of non-drinkable food made by either the food industry or by the family.

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Chapter 1. Introduction

1.1. Maternal and child health in a global context

Maternal and child deaths are relatively rare in developed countries, but they remain common events in the developing world. Recently the World Health Organization (WHO), United Nations Children Fund (UNICEF) and United Nations Population Fund (UNFPA) estimated that there are 529,000 maternal deaths globally each year and 99 percent of these deaths occur in developing countries (WHO, UNICEF and UNFPA, 2003). Maternity-related causes were considered as the primary health problem in women of reproductive age in developing countries, accounting for 18 percent of the total disease burden (World Bank, 1993). The prevalence for any perceived obstetric morbidity reported ranged from 79 percent in Bangladesh (Uzma *et al.*, 1999) to 64 percent in Egypt (El-Mouelhy *et al.*, 1994). More than ten million children younger than five years still die every year in low- and middle-income countries (WHO, 2002). Current data indicate that the world's average mortality rate of children under five years old was 83 deaths per 1000 live births in 2000. In 1990, there were 180 deaths per 1000 live births in sub-Saharan Africa whilst only 9 per 1000 live births in developed countries. By 2000, the relative size of this gap had increased to 29-fold with mortality rates of 175 and 6 per 1000 children in sub-Saharan Africa and developed countries respectively (UNICEF, 2001).

WHO has summarised three major factors underlying the medical causes of maternal mortality (WHO, 1999). Firstly, lack of access and utilization of essential obstetric services is a crucial factor contributing to maternal deaths. There is a strong inverse association between national maternal mortality rates and national levels of delivery care utilization. A recent study found a correlation of -0.71 between maternal mortality and maternal service utilizations (Kunst and Houweling, 2001). However, the evidence showed that globally only modest improvements in coverage of care at delivery have occurred with an average annual increase of 1.7% over the period 1989-1999 (Abouzahr and Wardlaw, 2001). Secondly, the low socio-economic status of girls and women is a fundamental determinant of maternal mortality in some developing countries. Their low status in the family and society has limited their

access to education and good nutrition as well as to the economic resources for paying for health care services. Some women are denied access to necessary care, either because of the cultural practice of seclusion, or because decision-making is the responsibility of other members of the family, such as husbands or parents-in-law. Thirdly, excessive physical work together with improper diet also contributes to poor maternal health, obstetric problems and maternal outcome.

Malnutrition has been found responsible, directly and indirectly, for 60 percent of the 10.9 million deaths among the children under five. Over two-thirds of these deaths, which are often associated with inappropriate feeding practices, occur during the first year of life (WHO, 2003). Stoll (1997) reported that the major causes of death during the late neonatal period are sepsis, acute respiratory infections, neonatal tetanus, umbilical infection, meningitis and diarrhoea. It is estimated that 44-100 percent of deaths in the late neonatal period reported in community studies are due to infections that breastfeeding can help prevent (Stoll, 1997). It is estimated that among children living in the 42 countries that accounted for 90% of the global child mortality, a group of interventions including breastfeeding, complementary feeding, vitamin A, and zinc supplementation could save about 2.4 million children each year (i.e. 25% of the total deaths) (Jones *et al.*, 2003). However, no more than 35% of infants worldwide are exclusively breastfed during the first four months of life, whereas complementary feeding frequently begins too early or too late, and foods are often nutritionally inadequate and unsafe (WHO, 2003). In 2001, the World Health Assembly passed a resolution recommending exclusive breastfeeding for the first six months of life as a global public health recommendation (WHO, 2001). International consensus is that optimal breastfeeding practice for infants and young children consists of exclusive breastfeeding for the first six months of life with continued breastfeeding up to two years of age and beyond.

1.2. Vietnam

1.2.1 History in brief

The Socialist Republic of Vietnam is located in Southeast Asia bordering the People's Republic of China to the north, the People's Democratic Republic of Laos and the Kingdom of Cambodia to the west, and the Pacific Ocean to the east. With a

coastline of thousands of kilometres from north to south, the country has a total land area of 330,000 km^2 and total sea area of one million km^2. The country has a total population of 80.7 million in 2003 ranking the third largest population in Southeast Asia, and the fourteenth in the world. Vietnam is divided into 64 provinces and major cities directly administered by the central government. In each province, the administrative structure consists of provincial, district and commune levels. At present, the country consists of 637 districts and 10,732 communes (General Statistical Office of Vietnam, 2004).

Vietnam's history from an early age had been a nation characterised by uninterrupted struggles against foreign invaders. The period of Chinese Domination lasted 1117 years between 179BC and 938AD. This was one of the fiercest trials and periods of hardship in Vietnam's history of national development of the different tribal peoples inhabiting Vietnamese soil. However, the Vietnamese people managed to maintain their particular cultural identity. Revolts which were led by the Two Trung Ladies, Lady Trieu, and Ly Nam De, and especially the historic victory at the Bach Dang river in 938 AD, under the leadership of Ngo Quyen, finally led the Vietnamese people to a complete victory and regained their national independence. The next one thousand years (from the early 10th Century to the middle of the 19th Century) was a period of national independence and construction. This period also witnessed several fierce struggles launched by the Vietnamese people against the northern aggressors.

The conquest of Vietnam by France began in 1858 and was completed by 1884. Vietnam became part of French Indochina in 1887. Independence was declared post World War II, after the Vietnamese Alliance Forces took power from the Japanese. However, the French came back to Vietnam and ruled the country from 1946 until 1954 when they were defeated by Communist forces. After the surrender of the French in Dien Bien Phu in July, 1954, American forces invaded Vietnam through the so-called economic and military aid to South Vietnam. Since then, Vietnam had been a centre of the world's political affairs until the fall of Saigon in April, 1975, a milestone in the defeat of the American administration in the Vietnam War.

Despite the return to peace, for over fifteen years the country experienced little economic growth because of conservative leadership policies. Since the early 1990s,

Vietnamese authorities have committed to economic liberalisation and enacted structural reforms needed to modernize the economy and to produce more competitive and export-driven industries. Under the reforms, annual GDP growth has averaged over seven percent whilst inflation rates and the fiscal deficit have been substantially reduced. Exports have grown by more than 30 percent per annum to become a leading sector in the economy. In 2003, the GDP per capita reached US$485 with a real annual growth rate of 7.24% (UNDP, 2004).

1.2.2. Health care system

The state health care system in Vietnam is organised as a four-tiered pyramid. At the top of the pyramid is the Ministry of Health (MOH), followed by provincial, district and commune health authorities (see Figure 1.2.1). The MOH consists of 14 administrative and technical departments with about 300 staff. At the central level, different national specialized hospitals and tertiary schools professionally assist the MOH to deal with different health issues. Most central health facilities are located in Hanoi and other major cities such as Ho Chi Minh City and Da Nang City. According to current data of the MOH, there are 30 central general and specialised hospitals with more than 12,680 beds that serve as the highest referral level for clients (Ministry of Health of Vietnam, 2004).

Provincial Departments of Health (DOH) represent the second tier of the pyramid in all 64 provinces and serve populations ranging from 0.25 to 5 million. Under the DOH are 4-8 departments with different functions, either administrative or technical. In most provinces other than some highland provinces, there is a provincial general hospital plus specialized hospitals including an obstetric and

Figure 1.2.1: Health care system in Vietnam

gynaecological one. According to the 2003 official data, there are 109 provincial general and 86 specialized hospitals providing more than 55,922 beds nationwide
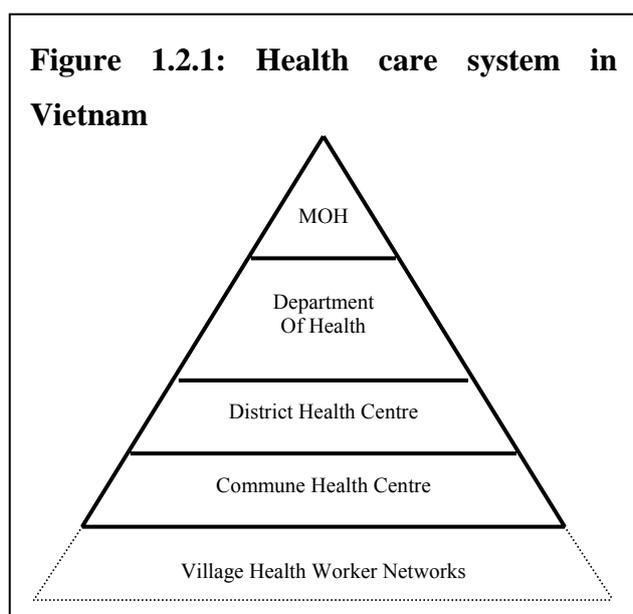
(Ministry of Health of Vietnam, 2004). In both MOH and DOH, maternal child health and family planning departments and centres operate technical and management roles to provide reproductive health and child health services. Whilst the DOH operates under the administrative control of the Provincial People's Committee, it still has to follow the policies and regulations of the MOH. Since 1998, through the government decentralisation policy, the health care budget for provinces has been directly transferred to provinces, so that the Provincial People's Committee is responsible for making decisions on the allocation of health care budget within the province.

The District Health Centre (DHC) is at the third tier of the pyramid in charge of health issues within the district. DHC functions under the supervision of the District People Committee and Provincial Department of Health. There are 568 district hospitals nationwide that provide 40,000 beds (Ministry of Health of Vietnam, 2004). Each DHC consists of a district general hospital and several specialized units, for instance, preventive medicine and hygiene unit, and a mobile team. The obstetric department of a district hospital provides obstetric and gynaecological services for those who reside in the district. A district hospital is supposed to serve as a main referral point for all Commune Health Centres (CHCs) in the district.

The CHC lies at the bottom of the pyramid that is responsible for providing primary health care including preventive, ambulatory, in- and out-patient services as well as transferring complicated cases to appropriate referral levels. Under the supervision of the DHC, a CHC implements different national health programmes such as the Expanded Programme of Immunization and Family Planning. There are 10,372 CHCs with 45,995 beds throughout the country (Ministry of Health of Vietnam, 2004). A CHC typically consists of 4-6 staff led by a doctor or assistant doctor. Usually a CHC is staffed at least by a midwife, a nurse, an assistant doctor specialised in obstetrics and child health, and an assistant pharmacist.

Under the supervision of CHC, a village health worker network also operates in villages. This network includes retired health staff, primarily medical trained and even untrained villagers who are key members of mass organizations. Village health

workers are supposed to mobilise and assist commune health staff for the implementation of national health programmes. They also provide some simple services such as treatments for common illnesses.

Health sector reform was introduced into Vietnam in the early 1990's, including (i) the introduction of user fees for health services at higher-level public health facilities, (ii) legalization of private practice and the sale of drugs in the open market, and (iii) introduction of health insurance with primary focus on state employees. The health sector reform has had profound effects on the health sector and health seeking behaviour of the community (World Bank, 2001).

Under the health sector reforms, the private sector in health care has rapidly developed. The Ministry of Health and Provincial Department of Health are responsible for overseeing private practices. The decree on the private practice of medicine does not allow health professionals who are working in a government health facility to have a full-time license. Only retired health staff can have a full-time license and government staff can only apply for a part-time license. It is estimated that 70% of private practices are located in urban areas and only 30% in rural areas. While about 80% of the population live in rural areas, there are 8 times as many private facilities in urban than in rural areas (World Bank, 2001).

1.2.3 Maternal and child health

Despite being one of the poorest countries in Asia, Vietnam's overall state of health is better than would be expected for a country at its level of income per capita. This could be a consequence of its socialist characteristics including a network of basic social services throughout the country and the equality of educational opportunity (World Bank, 2001), as evident from the basic data on Vietnam presented in Table 1.2.1.

According to official data, infant mortality rate (IMR) and maternal mortality ratio (MMR) have declined in the past twenty years. However, there is disagreement on the current rates of IMR and MMR in Vietnam. Based on the 2003 official data of the MOH, the estimated MMR was 95 maternal deaths per 100,000 live births (Ministry of Health of Vietnam, 2003a), which appeared to be more than 40 percent

lower than that of a national study in the same period: 165 maternal deaths per 100,000 live births (Ministry of Health of Vietnam, 2003b). Studies have also indicated that unsafe abortion could contribute to the high maternal mortality (WHO, 1999). Unfortunately, there has been a very high rate of abortion in Vietnam. The total abortion rate was estimated as 2.5 abortions per woman during her reproductive life in 1990s (World Bank, 2001, Goodkind, 1994). National Health Survey 2001-2002 reported that 14.4% married women had unwanted pregnancies and 12% experienced abortion in the five years prior to the survey (Ministry of Health of Vietnam, 2003c).

The 2002 Demographic and Health Survey (DHS) showed that IMR had dramatically dropped from 29.6 infant deaths per 1,000 live births during the period 1993-1997 to 18.2 during 1998-2002 (Committee for Population Family and Children, 2003). It is extremely unlikely that infant mortality fell about 40% within the very short interval of five years, indicating a large survey bias due to its small sample size. In addition, although the malnutrition situation among children under 5 years of age has greatly improved compared to the 1990s, the malnutrition rate is still high with weight-for-age and height-for-weight malnutrition rates at 30.1% and 33%, respectively (National Institute of Nutrition & UNICEF, 2003).

It should also be emphasized that the disparity in maternal and child health indicators between regions has been quite large. For instance, the MMR in Cao Bang, a northern province, was 410, ten times higher than in Binh Duong – a province in Southeast region of Vietnam with MMR of 45. The IMR in rural areas was 2.2 times higher than that in urban areas. The IMR in North Central provinces was 2.7 times higher than that in southeast provinces (Committee for Population Family and Children, 2003). The respective weight-for-age and height-for-weight malnutrition rates were 36.0% and 39.4% in the North Central region, compared to 24.4% and 26.2% in the Southeast region.

Table 1.2.1: Basic data on Vietnam

Total area [a] (km^2)	331,114
Population [d] (million people)	80.7
Female (%)	50.8
Male (%)	49.2
Urban (%)	25
Rural (%)	75
Population density (persons per km$^{2)}$ [b]	242
GDP per capita (USD) [a]	485
Literacy (aged 10 and over, %)[c]	
Urban	Female: 93.4 Male: 97.1
Rural	Female: 86.5 Male: 93.4
Life expectancy (years) [d]	71.3
Female	73
Male	70
Crude birth rate (‰) [d]	19.0
Crude dead rate (‰) [d]	5.8
Population grow rate (%) [d]	1.32
Total fertility rate (No children per woman) [b]	1.87
Urban	1.4
Rural	1.99
Contraceptive prevalence rate (any methods, %) [b]	78.5
Total abortion rate (No of abortions per woman) [b†‡]	0.62
Maternal mortality ratio (per 100,000 live births) [e]	165
Infant mortality rate (per 1,000 live births) [d †]	1.82
Under five mortality rate (per 1,000 live births) [d †]	32.8
Malnutrition rate of children under 5 years old (%) [d]	30.1

Sources:

[a] UNDP (2004) Vietnam development cooperation report. Hanoi Vietnam.
[b] VCPFC (2003) 2002 Demographic and Health Survey. Hanoi Vietnam.
[c] General Statistics Office (2001) 1999 Population and Housing Census. Hanoi Vietnam
[d] Ministry of Health (2004) 2003 Statistical Year Book. Hanoi Vietnam.
[e] Ministry of Health (2003) maternal mortality in Vietnam in 2000-2002. Hanoi Vietnam.
[†] Rate is likely to be underreported.
[‡] Data for married couple only

1.2.4. Major challenges in maternal and child health

1.2.4.1 Underutilization of maternal services

In the area of maternity care, although the maternal services at CHCs have been relatively highly subsidized by the government, official data showed that the utilization of delivery services at primary health care settings in rural areas is still low compared to the national target. The National Committee for Population and Family Planning reported that during 1997 only 61.7 percent of deliveries occurred at a health facility and 38.3 percent at home (National Committee for Population and Family Planning, 1999a). By 2002, 78.5 percent of deliveries occurred at health facilities and 21.3% at home. Whilst there was modest change in the proportion of facility-based deliveries from 56% in 1994 to 61.7% in 1997, the sharp increase reported by the 2002 DHS has led to concern on the reliability of data. Moreover, according to the 1997 DHS, the average number of clients examined and treated by a health worker per day at CHCs ranged from 1.1 to 8.6 (National Committee for Population and Family Planning, 1999b). A recent study conducted in 12 provinces of Vietnam reported that the number of clients at well-staffed CHC remained low. The average number of clients at a CHC seen by a health worker per day varied from 0.25 to 6.2 (UNFPA, 2003). In addition, the disparity in the proportion of facility-based deliveries between regions has been large. For instance, whilst most of deliveries in the Red River Delta occurred in a health facility, they accounted for only 43.7% for Northern Uplands (Committee for Population Family and Children, 2003).

1.2.4.2 High rate of unwanted pregnancy

Official data indicated that 78.9% married women use a contraceptive method, of which 56.7% used a modern method. However, about a quarter of births were unplanned: 14% mistimed and 9% unwanted contributing to the high abortion rate. Almost two thirds of pregnancy terminations occurred among women who were using contraception at the time of becoming pregnant, reflecting the poor quality of contraceptive measures that were being used (Committee for Population Family and Children, 2003).

1.2.4.3 Poor infant feeding practice

Malnutrition can be closely linked to cultural beliefs concerning child bearing and feeding practices in the community (World Bank, 2001). Whilst almost all infants are breastfed, at least initially, the 2002 DHS found that only 31% of infants less than two months of age were exclusively breastfed. The rate declined rapidly to 12.1% when infants were 2-3 months of age, and 7.7% when they became 4-5 months of age. Another national nutrition survey reported the proportion of infants less than 4 months of age exclusively breastfed accounted for 29.2% (National Institute of Nutrition & UNICEF, 2003).

In summary, Vietnam has a relative well-structured health care system, including a universal primary health care structure, when compared to countries with a similar per capita income. However, the current low utilization of maternal services at primary health care level, the high rate of abortion, and low rate of infant breastfeeding have negatively affected health status of women and children and contributed to high maternal and child mortality and morbidity. For these reasons, it is important to investigate factors affecting the utilization of maternal services, contraception, and infant feeding practice in the community.

1.3. Significance of the study

Utilization of maternal services is an outcome of a social process in which both the social characteristics of an individual such as social class, and structural characteristics, such as the availability and accessibility of health services, play a role. Whilst both individual and village level factors play a role in the utilization of maternal care services, it is also evident that individual level characteristics shape the association between the structure of the maternal services and the use women make of them (Anson, 2004). Studies also indicated perceived quality of maternal services (Kyomuhendo, 2003, Anson, 2004, Djan *et al.*, 1997a) and preference of and willingness-to-pay to the services (Foreit and Foreit, 2003) are positively associated with its utilization. In Vietnam, only a few qualitative or anecdotal studies have been undertaken concerning factors that influence the utilization of maternal services. A small qualitative survey was conducted to orient health education activities in the community by exploring traditional pregnancy and childbirth practices (Duong and

Bale, 2000). Socio-cultural factors influencing the utilization of services in minor ethnic communities had been reported (Nhan and Mai, 1999). However, application of these small sample findings to the broader Vietnamese context is limited.

Studies indicated that unintended pregnancies within a short interval often end in abortion (Vikat, Kosunen and Rimpela, 2002, Henshaw, 1990). In the literature there are few reports of studies on postpartum contraception. Most research has dealt with the appropriate choice and timing of contraceptive use in general, and with the reliability of lactational amenorrhea in particular (Labbok *et al.*, 1997, Saarikoski, 1993). There are some studies on family planning in the Vietnamese context (Hoa *et al.*, 1996, Gorbach *et al.*, 1998b, Gorbach *et al.*, 1998a, Thang and Huong, 2003, Ross and Pham, 1997, Hardjanti, 1995), yet no studies have specifically investigated postpartum contraception.

Factors influencing breastfeeding have been reported in the international literature (McCarter-Spaulding and Kearney, 2001, Bulk-Bunschoten *et al.*, 2001, Moffat, 2002, DiGirolamo, Grummer-Strawn and Fein, 2001, Adair *et al.*, 1993, Kendall-Tackett and Sugarman, 1995). Although several studies have reported on breastfeeding practices amongst Vietnamese migrants in other countries (Rossiter and Yam, 2000, Sharma, Lynch and Irvine, 1994), very little research has been undertaken in Vietnam, particularly in the rural areas. The conclusions that can be drawn from these studies are rather limited due to either small sample sizes (Morrow, 1996, Doyle, 2001, Dearden *et al.*, 2002b) or limitations in data analysis (Doyle, 2001, Ministry of Health of Vietnam, 2001).

In summary, childbirth, breastfeeding and contraception are interrelated issues that directly contribute to maternal and child mortality and morbidity. Unfortunately, these issues have not been sufficiently studied in developing countries in general, and Vietnam in particular. This study on determinants of maternal service utilization, postpartum contraception and infant feeding practice is therefore significant for three reasons. Firstly, it contributes to better understanding about the influence of social, cultural, psychological and economic factors on maternal and child health practices in Vietnam. Secondly, whilst most studies on maternal and child health have

concentrated on women as the sole target group, this research explores the role of husbands/men and in-laws in childbirth and breastfeeding. The research therefore provides a more comprehensive view on childbirth and breastfeeding issues taking into consideration gender-sensitivity. Finally, the research provides the basis for evidence-based recommendations to health managers and policy makers, so that appropriate strategies can be formulated to effectively and efficiently manage maternal and child health programmes in Vietnam.

1.4. Objectives of the study

1.4.1. Overall objective

To investigate factors that influence the utilization of maternal services, infant feeding and postpartum contraception practices in rural Vietnam.

1.4.2. Specific objectives

- To measure preference and willingness-to-pay to maternal services.
- To measure perceived quality of maternal services and its influence on the utilization of services.
- To explore factors that influence the utilization of maternal services.
- To document infant feeding patterns within six months postpartum.
- To investigate factors that influence infant feeding practices within six months postpartum.
- To assess factors that influence contraception utilization within six months postpartum.
- To provide recommendations to health policy makers and managers to improve effectiveness and efficiency of maternal and child health programmes.

1.5. Outline of the thesis

This thesis is presented in a form of seven original research papers, together with an introductory chapter and a concluding chapter. Chapter One highlights major issues relating to maternal and child health at a global level and Vietnam in particular. The rationale and objectives of the study are also described. Chapter Two contains a review of literature relating to factors associated with the utilization of maternal

services, breastfeeding, and contraception during the postpartum period. Chapter Three summarizes the methodological issues of the present study including design, data collection and statistical analyses. The seven articles that form the basis of this thesis are given in Chapter Four. Finally, limitations and recommendations of the study are presented in Chapter Five. In addition, questionnaires used in this study are provided in Appendix 1. A statement of authors' contribution for each publication is presented in Appendix 2.

Chapter 2: Literature Review

This chapter presents a critical review of the literature on three themes: (i) determinants of utilization of maternal services, (ii) determinants of breastfeeding, and (iii) determinants of postpartum contraception. While relevant studies in both developing and developed countries are reviewed, findings and methodological issues in the context of developing countries are emphasised.

In Section 2.1, before presenting major factors influencing the utilization of maternal services, the trend in deliveries assisted by skilled birth attendants and the framework of service utilization are described. Socio-demographic variables such as maternal age, marital status, education, occupation, parity, ethnics, religion, family income, residence and environment are considered. Aspects relating to access to and costs of maternal services are then discussed. Influence of cultural and traditional childbirth practices, and of mother's childbirth experience to her decision-making on the location for maternal services are also addressed. The role of husband/partner and close relatives in the utilization of maternal services is next presented. In addition, the concept of client-perceived quality of care and its influence on the service utilization are also outlined. The shortfalls in quantitatively measuring perceived quality of services, especially in the context of developing countries, are briefly discussed. Finally the concept of client's preference and willingness-to-pay and its application in maternal health are reviewed in this section.

In Section 2.2, determinants of breastfeeding are presented. Benefits of breastfeeding and trends in breastfeeding in developing countries are firstly documented. Decision making models for breastfeeding are then outlined. After that, personal characteristics including maternal age, socio-economic status, ethnicity, smoking status, and maternal employment are reviewed. Attitudinal and intra-personal characteristics are discussed next with a focus on prenatal intentions, maternal attitudes, and maternal confidence. Factors relating to hospital policies and intra-partum experiences such as rooming-in, supplementary feeding, early hospital

discharge, location of delivery, and mode of delivery, are also analysed. Additionally, cultural beliefs and practice regarding breastfeeding and infant's related factors including infant's health and gender are examined. Informal sources of support such as husband/partner and close relatives, and formal sources i.e. health care professionals, as determinants of breastfeeding are next assessed. Finally, the influence of marketing activities of infant formula industries is discussed.

In Section 2.3, variables influencing the practice of postpartum contraception are considered. The concept and prevalence of postpartum contraception in conjunction with breastfeeding are discussed. Influence of personal characteristics including maternal age, parity, and education are then examined. Attitudinal and intra-personal characteristics including previous experiences with maternal health care services, contraception perception, desire to have more children, and satisfaction with contraceptive methods are then discussed. In addition, influence of mother's health status on postpartum contraception is documented. The role of health providers on contraceptive use is also explored. Finally, influence of husband/partner and close relatives on contraception practice is addressed.

2.1. Factors influencing utilization of maternal services

2.1.1. Trend in deliveries assisted by skilled attendants

In developing countries, despite great public health effort, many women are still assisted in delivery either by traditional birth attendants, relatives or deliver by themselves. According to a recent report of United Nations in 2004, approximately 65 percent of all pregnant women received at least some care during pregnancy. Forty percent of deliveries took place in health facilities, and skilled health workers assisted slightly more than half of all deliveries. In South Asia, 35 percent of deliveries were attended by a skill attendant, and in sub-Saharan Africa it was 41 percent (United Nations, 2004). Globally, modest improvements in coverage of skilled care at delivery have occurred with an annual average of 1.7 percent increase over the period of 1989-1999. Typically, in sub-Saharan Africa, the average annual rate of skilled attended deliveries increased by only 0.1 percent (Abouzahr and Wardlaw, 2001).

2.1.2 Framework to examine factors influencing the utilization of maternal services

Andersen (Andersen, 1995) classified the determinants of the utilization of health services into three categories:

i. Need, which refers to health status, perceived by individuals or evaluated by health providers.

ii. Enabling resources, which provide patients with the means to make use of services, for instance, income, health insurance, travel distance, etc.

iii. Predisposing characteristics, which are factors that exist prior to the onset of the ill health and need for care, for instance, age, sex, ethnicity, education, occupation; which are related to attitudes, values and knowledge about health and health services.

Figure 2.1.1: Attitudes-Social influence-Self efficacy framework of delivery decision (Adapted from Amooti-Kaguna and Nuwaha, 2000)
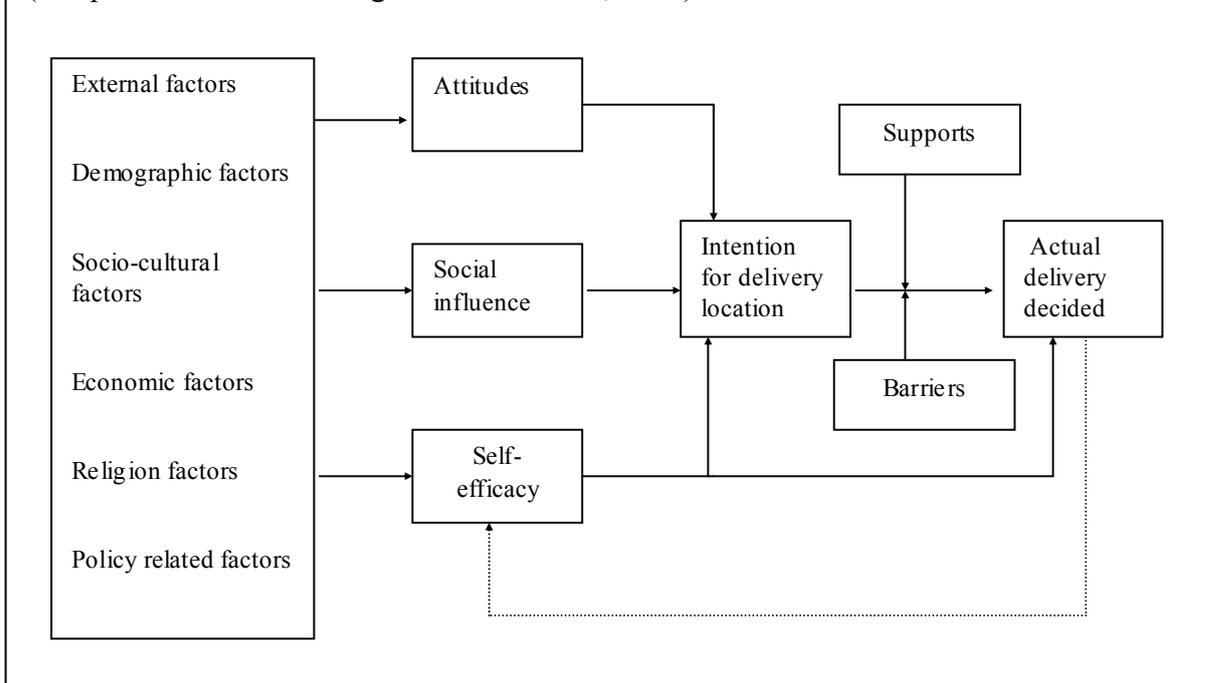
In the literature, the attitude, social and self-efficacy model (ASE-model) has been used in studies on determinants of utilization of health services in general, and maternal services in particular (De Vries and Backbier, 1994, De Vries, Dijkstra and Kuhlman, 1988, Amooti-Kaguna and Nuwaha, 2000). The model is an integration of

the Fishbein and Ajzen's theory of reasoned action and Bandura's social learning theory. In the model, behaviour such as the choice of delivery site is considered to be a result of behaviour intention. Three main psycho-social factors have been identified that predict behaviour intention: attitudes, social influences, and self-efficacy. A person's attitude towards a specific behaviour is a result of the consequences that person expects from performing the behaviour. Social influence is as a result of social norms relevant to the behaviour, support from others to perform or refrain from the behaviour, and whether others perform or refrain from the behaviour themselves. Self-efficacy expectations can be seen as a person's belief whether she can perform the desired behaviour and can cope with barriers that may hinder actual performance. The implication of the model is that health behaviour of women can depend on her attitudes, her perception of social norms and social support, and her self-efficacy expectations. External sources such as social, demographic, and economic variables are expected to influence behaviour through behavioural determinants and intentions (Amooti-Kaguna and Nuwaha, 2000). The ASE-model is summarised in Figure 2.1.1.

2.1.3 Socio-demographic factors

2.1.3.1 Maternal age

Since younger and older women differ in their experience and influence, their health seeking behaviour is likely to vary. In general, younger women are more likely to accept modern health care than older women, as they are likely to have greater exposure to modern medicine and have more schooling. Older women, on the other hand, have accumulated knowledge on maternal health care and are therefore likely to have more confidence about pregnancy and childbirth; consequently, they may give less importance to obtaining institutional care (Raghupathy, 1996).

However, a study conducted in Botswana found that teenage mothers used health facilities for delivery less frequently. For example, teenage mothers were 13 times more likely to have no antenatal care check-up and were six times more likely to have postnatal check-up, and 11 times more likely to give birth attended by unqualified birth attendants compared to women aged 35 and above (Letamo and Rakgoasi, 2003). In a study in India, Navaneetham and Dharmalingam found that older women in Andhra Pradesh and Karnataka are more likely to deliver a baby in

the health care institutions than younger women (Navaneetham and Dharmalingam, 2002). Moreover, a study in Bangladesh indicated that type of assistance utilized at delivery does not differ significantly with the age of the mother (Paul and Rumsey, 2002).

2.1.3.2 Marital status

It has been found that never-married women were significantly less likely to use institutional births or delivery attended by a qualified birth attendant (Letamo and Rakgoasi, 2003, Mekonnen and Mekonnen, 2003). For instance, a study in Ethiopia found that married women were 40 percent more likely to receive antenatal care from a health professional than unmarried women (Mekonnen and Mekonnen, 2003).

2.1.3.3 Education

Education of women was found positively and independently predicted the use of delivery services in Ethiopia. The corresponding odds ratio for women with primary and at least secondary education compared to women with no education was about three and a half times and eight times respectively (Mekonnen and Mekonnen, 2003). Similarly, a study in India reported that women with no education were more likely to deliver a baby at home than hospital (Navaneetham and Dharmalingam, 2002). In rural areas of the Philippines, the effect of women's education on the utilization of maternal services was large: an 11 percent increase in the odds of receiving moderate levels of prenatal care and a 19 percent increase in the odds of receiving adequate care for each additional year of schooling (Becker *et al.*, 1993).

Educated mothers are considered to have greater awareness of the existence of maternal health care services and benefits in using such services. Educated mothers are also likely to have better knowledge and information on modern medical treatment and have greater capacity to recognize specific illness. As education empowers women, they will have greater confidence and capabilities to make decisions to use modern health care services for themselves and for their children (Raghupathy, 1996). Education also enables women to take personal responsibility for their own health and health of their children (Caldwell, Reddy and Caldwell, 1989).

2.1.3.4 Occupation

A study in India reported that working women have greater control over resources in the household. They are likely to have greater knowledge about pregnancy and childbirth due to freedom of movement outside the household. They also tend to seek information on services available for pregnancy care during work. If women do not earn income as they work in their family business, they are expected to have little control over resources in the household and thus their ability to seek health care services would be limited (Desai and Jain, 1994). Another study in Jamaica reported that women employed in higher order professions were found to attend antenatal care early but women dependent on their parents did not. Housewives, the unemployed and women in middle level positions were often late attenders of antenatal care (McCaw-Binns, La Grenade and Ashley, 1995).

On the other hand, the work by women in developing countries is poverty-induced and therefore likely to have negative impact on the use of health care services as it involves opportunity and monetary costs (Desai and Jain, 1994, Basu and Basu, 1991). Meanwhile, a study in China found that occupation is not related to place of delivery (Anson, 2004).

2.1.3.5 Parity

Parity is strongly associated with utilization of maternal services. Most studies indicated a strong negative relationship between parity and utilization of medically trained personnel at delivery. Women tend to give greater attention to their first pregnancy, as they are inexperienced with pregnancy, and therefore more likely to seek modern health care services. Conversely, women with higher parity are likely to give less attention to seeking maternal health care services (Bhatia and Cleland, 1995, Raghupathy, 1996, Mekonnen and Mekonnen, 2003, Letamo and Rakgoasi, 2003, Glei, Goldman and Rodriguez, 2003, Navaneetham and Dharmalingam, 2002). Paul and Rumsey indicated that women do not perceive higher-order births risky. Instead, they believe that women giving higher-order births are experienced with pregnancy and will not encounter any complications during delivery (Paul and Rumsey, 2002).

Birth order effects also reflect the fact that having other children in household may determine whether or not women seek maternal health care services. A study in Philippines (1987) indicated that an increase in the number of children of preschool age in the family was negatively related to prenatal care utilization in urban areas (Wong *et al.*, 1987). Kabakian-Khasholian et al in a study in Lebanon reported a reason for multiparous women to go to health facilities for delivery late is that their older children were left at home (Kabakian-Khasholian *et al.*, 2000).

2.1.3.6 Ethnics and religion

There have been few studies focusing on the influence of ethnics and religion on the utilization of maternal services. A study in Turkey found that Kurdish women were substantially less likely to have facilities delivery vs. traditional home deliveries, and modern home deliveries vs. traditional home deliveries (Celik and Hotchkiss, 2000). A study in Peru reported that women who are non-Spanish speakers are less likely to seek maternal health care services than Spanish-speaking women (Elo, 1992).

A study in South India reported that Muslims are more likely to deliver at a hospital than Hindus (Bhatia and Cleland, 1995). Similarly, Navaneetham and Dharmalingam reported that Muslim women were about 40 percent more likely to have been assisted by a health professional than their Hindu counterparts in Karnataka, but about 70 percent less likely to be assisted by a health professional in Kerala (Navaneetham and Dharmalingam, 2002).

Mekonnen and Mekonnen showed a significant difference in the uptake of antenatal care by religion. Women who followed Orthodox, Muslim and Protestant religions exhibited comparable and higher use of antenatal care (ranged from 24.8 to 28.3 percent) than those women who followed traditional beliefs (11.3 percent). Compared to Orthodox/Catholic women, Muslim women were nearly one and a half times more likely to use antenatal services. In contrast, women with a traditional belief were less likely to use the service compared to any other religious group. Moreover, such women were 40 percent less likely to use the service compared to Orthodox/Catholic mothers. On the other hand, there was comparable likelihood of using the service among Orthodox/Catholic and Protestant. The negative influence of traditional religion in rural areas may be attributable to the traditional spiritual

explanation of the events, including diseases. Traditional perceptions of events may tie followers to the use of traditional medicines and encourage the use of formal systems only when the traditional option fails (Mekonnen and Mekonnen, 2003).

2.1.3.7. Family income

Living standard of the household was an important factor affecting institutional delivery. Rich women are much more likely to deliver in a hospital than their rural peers in Jamaica (Gertler *et al.*, 1993). Women with a high standard of living were about 3-5 times more likely to deliver in a health care institution than those with lower living standard (Navaneetham and Dharmalingam, 2002).

A study in China found that per-capita income and living arrangements, on the other hand, were not significantly related to utilization of any the maternal care services after controlling for age, education and parity (Anson, 2004). A study in rural Guatemala revealed that the lack of an association between family income and utilization of biomedical services is not surprising because many pregnant women rely on government facilities that provide services at little or no cost (Glei, Goldman and Rodriguez, 2003).

2.1.3.8. Urban vs. rural

The location of residence is an important predictive variable for maternal service utilization. A study in Peru using Demographic and Health Survey data revealed that women who grew up in rural towns or the countryside are less likely to seek modern health care services during pregnancy and delivery than women who grew up in cities (Elo, 1992). Similarly, Mekonnen and Mekonnen reported that women living in Addis Ababa were about 40 times more likely to receive assistance during delivery compared to their rural counterparts. The corresponding figure for women from other urban areas of the country was about nine times (Mekonnen and Mekonnen, 2003). Navaneetham and Dharmalingam reported that women who resided in urban areas were more likely to be assisted by health professionals during delivery than those who lived in rural areas (Navaneetham and Dharmalingam, 2002). Also, rural women were reported by Letamo and Rakgoasi two times more likely to have had a non-institutional birth and no antenatal check-ups, two times more likely to have no

postnatal check-up, and over five times more likely to have unqualified delivery assistance, compared to urban women (Letamo and Rakgoasi, 2003).

2.1.3.9 Environment factors

Women with no sanitary facilities, and who got water from traditional sources such as river or stream, who live in rented accommodation or under other tenure such as leasehold or squatting, were at high risk of not seeking antenatal care. Women with no sanitary conveniences were also unlikely to attend antenatal care at the early stage (McCaw-Binns, La Grenade and Ashley, 1995). However, these environmental factors may merely reflect their socio-economic status.

2.1.4 Access to services

A study assessing maternal and neonatal health services in 49 countries based on the rating of 1,037 experts, found that on average 68 percent of urban women and 39 percent of rural women had access to maternal services. Access to a 24-hour district hospital for urban and rural women was 81 percent and 58 percent respectively. For access to delivery care by trained professional attendants, it is 75.5 percent and 43.9 percent respectively for urban and rural women (Bulatao and Ross, 2002). Table 2.1.1 shows access of women to maternal services in the 49 countries as reported by Bulatao and Ross (2002).

Several studies have drawn conclusions regarding the influence of access to services on utilization. Thaddeus and Maine reported that distance is an important barrier to seeking health care, particularly in rural areas. It exerts a dual influence: long distance can be an actual obstacle to reaching a health facility, and it can be a disincentive to even trying to seek care. In addition, the effect of distance becomes stronger when combined with lack of transportation and poor roads (Thaddeus and Maine, 1994). A qualitative study in rural South Africa suggested that limited facility access and transport were main obstacles to the use of antenatal care (Myer and Harrison, 2003). In another study in Nigeria, a long distance from the hospital also contributed to low utilization of maternal services (Gharoro and Igbafe, 2000, Gharoro and Okonkwo, 1999). Furthermore, among women with low risk pregnancies in France, Combier found that accessibility or proximity was the most

important factor motivating the choice of delivery in a hospital for one third of the sampled women (Combier *et al.*, 2004).

Table 2.1.1: Percentages of pregnant women with access to maternal health services

	Rural areas		Urban areas	
	Mean	Rank	Mean	Rank
Adequate access to				
District hospital open 24 hours	57.7	37	81.3	1
Antenatal care	56.3	41	79.9	2
Delivery care by trained professional attendant	43.9	67	75.5	6
Postpartum family planning services	36.4	73	60.8	31
Treatment of postpartum haemorrhage	34.8	76	68.6	15
Management of obstructed labour	33.1	77	69.0	14
Treatment of complications of abortion	32.0	78	68.0	17
Provision of safe abortion services	21.1	81	44.7	66

Source: Bulatao and Ross (2002)

On the other hand, some studies indicated that physical proximity does not necessarily increase utilization. A study in China found that longer distance from township health centres was related to a decreased odds of using their antenatal service, but not related to the likelihood of home delivery or postnatal care (Anson, 2004). In a study in Nepal, Hotchkiss reported that physical access to a health facility has a statistically significant but modest impact on the use of maternal services (Hotchkiss, 2001). Similarly, in Bangladesh, distance between the residence of the respondents and the nearest hospital/clinics or trained TBA did not seem to influence the type of assistance used for delivery (Paul and Rumsey, 2002). Another study in rural Nepal found that although 90 percent of respondents lived within 5 km from a health facility, only 67 percent of first-line units offered prenatal care services at facility and/or outreach points, and only 38 percent provided skilled assistance in home deliveries. Within one km range from health facilities, coverage of prenatal care was only 32 percent. There are strong reasons for non-use of maternal services beyond geographical accessibility. These included cultural barriers, perceived low quality of care, perceived discrimination of rural people, and lack of perceived health gain (Jahn *et al.*, 2000).

Improving proximity to biomedical services is unlikely to have a dramatic impact on utilization in the absence of additional changes that improve quality of care or reduce barriers to access. In addition, even if access to health facilities improves, large differences by ethnicity and education level are likely to persist (Glei, Goldman and Rodriguez, 2003). A study in Kenya indicated that road improvement alone would not guarantee increased utilization of services due to institutional barriers such as costs of services. Although road improvements can significantly reduce travel distance and time to the health facilities, admission rates did not show substantial improvement (Airey, 1989). The magnitude of the impact of distance on the decision to seek care appears to be shaped by other factors such as the severity of the condition and reputation of the provider. Indeed, the nature of illness and quality of care appeared to be more important than distance (Stock, 1983). In the Philippines, clinic hours are inconvenient for many mothers resulting in poorly perceived quality of services among nonusers (Becker *et al*, 1993).

2.1.5. Costs of maternal services

Another variable that affects the utilization of services is the financial costs of receiving care, including transportation costs, physician and facility fees, cost of medication and other supplies, and opportunity costs.

A recent study in Tanzania reported that if the services were not subsidized, most of the households would have to allocate more than half of their annual income on standardized maternal health services. Any subsidy level above 25 percent would increase maternal health utilization, especially for those households in the lowest quintile of total annual expenditure (Prata *et al.*, 2004). An earlier study in Uganda found that after the introduction of cost sharing, overall utilization of general outpatient services dropped by 21.3 percent (Kipp *et al.*, 2001). Meanwhile, having insurance coverage could increase the probability of choosing a modern delivery than a traditional home delivery (Celik and Hotchkiss, 2000).

Although most government hospital services are described as free, there are hidden costs such as medicines, travel, and fees for attendants (Afsana and Rashid, 2001). In Bangladesh, free maternity care involves considerable hidden costs that may contribute to the low utilization of maternal services, especially among low-income

groups. The study found that 21 percent of families were spending 50-100 percent of monthly income, and 27 percent of families 1-8 times their monthly income, for maternity care. Moreover, 74 percent of caesarean mothers had insufficient funds of which 79 percent had to borrow money from others to pay for the services. Combined expenditure on travel, food, and hiring a caretaker was more than three times the amount spent for a normal delivery (Nahar and Costello, 1998).

A study in three Anglophone African countries found that indirect costs, including the costs of non-contact time of health personnel, time of supervisory and support personnel, and maintenance and utilities, also form an important component of the total services cost: 17 percent to 52.7 percent of routine services and 16.1 percent to 62 percent of obstetric complications (Levin *et al.*, 2003). On the other hand, costs to clients other than fees for services comprise more than 50 percent of total costs when fees for services are low, as in the case of Ugandan routine services and in public facilities in Malawi. In cases when the fees were more substantial, costs other than fees constitute less than half of the total cost (Levin *et al*, 2003).

Another study conducted in South Tanzania reported that time costs are constantly higher than financial costs. High direct payments and the fear of unofficial costs are acute barriers to the use of maternal services. Normally, users of maternal services pay mainly for admission, drugs, other supplies and travel costs. Travel costs represent about half of these financial costs. The average total costs vary between US$11.60 for antenatal consultation and US$135.40 for caesarean section at the hospital (Kowalewski, Mujinja and Jahn, 2002).

Studies indicated that women and their families might be reluctant to spend money on a normal event that can be practised at home at negligible expense. The worries of a potential complication in childbirth and the costs of medical care resulted in a difficult dilemma for most women. For most women, only in the event of an emergency or a 'complicated' birth that they felt it was worth spending the money (Afsana and Rashid, 2001).

Another important issue is the opportunity cost of the time used to seek health services. Time spend getting to, waiting for and receiving health services means time

lost from other, more productive activities, such as farming, fetching water and wood for fuel, herding, trading, cooking and so on. As women carry out many of these tasks, the value of their time and the competing demands is an important issue to consider (Thaddeus and Maine, 1994). In developing countries, women are often accompanied by relatives to health facility for delivery and those people incur expenses during their stay to support them. The availability of others to help with household chores and to look after children or to accompany patients to the facility can affect the decision to seek care (Habib and Vaughan, 1986).

However, some studies indicated that the financial cost of receiving care is often not a major determinant of the decision to seek care. In Nigeria, respondents ranked costs and distance fourth and fifth respectively in terms of influencing the decision to seek care (Nnadi and Kabat, 1984). A study in Ethiopia showed that costs of services were often less important consideration in utilization than were the quality of services and perceived efficacy of the treatment (Kloos, 1987). A few studies have even suggested that government facilities may be underutilized because they are free, but this probably holds only in more affluent societies (Auerbach, 1982, Lasker, 1981). In a study among women with low risk pregnancies in France, costs seem not to be an important determinant of maternal services. When women are covered by health insurance scheme for maternal services, cost of services may be perceived as an accessibility and not a financial issue (Combier *et al*, 2004).

2.1.6 Cultural and traditional childbirth practices

Social and cultural factors play a crucial role in the decision making process on maternal services utilization. Failure to integrate them into the provision may explain in part why policies often produce ineffective health services (Glei, Goldman and Rodriguez, 2003).

In traditional societies, childbirth is viewed as a normal event. It takes place at home and is highly supported by the family to meet the need for emotional and physical care and support (Steinberg, 1996, Jordan, 1978). According to Jordan, childbirth is a biosocial phenomenon: it involves a universal physiological process which is associated with specific socio-cultural practices differentially defined by each society. Childbirth differs from many conditions that require medical treatment.

Although childbirth and the immediate postpartum period are generally treated as a traumatic event in which both mother and child are vulnerable, childbirth is a regularly expected process for most women during part of their lifetime (Jordan, 1978). In Bangladesh, women perceived that childbirth is a natural act of God and did not expect delivery complications (Uzma *et al*, 1999)

In Uganda, the perception of normal vs. abnormal pregnancy can influence the delivery site. Mothers go to clinics 'only if they know that they usually get complications in labour' (Amooti-Kaguna and Nuwaha, 2000). Fikree at al in a study among women living in low socio-economic settlements of Karachi, Pakistan, found that despite 53.3 percent of women reported at least one illness symptom, many of them delay seeking health care. Some women believe that heavy vaginal bleeding and foul smelling vaginal discharge are caused by the rigors of labour and delivery and should therefore be endured. They also believe that it is important to release unclean, menstrual blood retained in the uterus during pregnancy (Fikree *et al.*, 2004). Some women may prefer to wait at home until the intervals between contractions are short. They prefer the comfort of their own home and delay going to the hospital as much as possible (Kabakian-Khasholian *et al*, 2000)

In Nigeria, most health problems were perceived as the consequence of one's sins. Complications in pregnancy are often assumed to be caused by committing extra-marital affairs or bewitching their spouses. Consequently, women tend to accept complications in pregnancy and after deliver as punishment for their sins, and men are often lukewarm over providing financial assistance or allowing their wife to seek treatment (Asowa-Omorodion, 1997).

Afsana and Rashid reported that most women preferred the squatting or kneeing position when giving birth which had been used for generations and which was more comfortable for them. Health workers were medically trained to deliver the baby with the woman in a lying down position. In addition, hospitals were perceived as a place for treating pathological phenomena. Receiving treatment from a hospital thus implied that something 'abnormal' had happened to their bodies. It is a common perception that women would be forced to undergo surgery if she gave birth in a biomedical establishment. If the scar remained unhealed it would affect their regular

household chores, sexual relationship and eventually their social status (Afsana and Rashid, 2001).

In Botswana, it has been reported that although 47 percent of women attended antenatal care at health facilities, 82 percent preferred to give birth at home and actually none attended a health facility for postnatal care. Women were reluctant to entrust the disposal of their placenta and other products of conception to strangers, such as the hospital nurses, and they felt that home deliveries were more convenient and safer (Chipfakacha, 1994).

Unlike TBAs, health workers most likely come from outside the locality. Rural women do not usually converse with unknown persons, particularly men. This behaviour is pertinent because most deliveries at rural health centres are attended by male physicians, and may be regarded as social and religious barriers to the use of health facilities for delivery purpose (Paul and Rumsey, 2002). The preference for a female obstetrician to attend an uncomplicated delivery also emerged among women in Beirut hospitals which serve communities known to be conservative and religious (Kabakian-Khasholian *et al*, 2000)

2.1.7 Mother's childbirth experiences

Previous childbirth experiences can influence the decision on the utilization of maternal services. In a cross-sectional survey involving 3,595 currently married women aged under 35 who have at least one child under five in South India, approximately 10 percent of the sample reported a problem during pregnancy, the most common of which were severe vomiting, swelling of hands and face, hypertension and fever. These women were much more likely to seek an institutional delivery than problem-free women. This implies that women either make an appropriate response to symptoms of possible disorders or are referred by practitioners. Similarly, a history of prior obstetric problems was significantly related to the probability of having an institutional delivery (Bhatia and Cleland, 1995).

Meanwhile, experience of delivery complications is the most important determinant in deciding the use of health facilities and/or trained TBA for childbirth. Complicated deliveries were often assisted by trained medical personnel either at home or at a

modern health facility than delivery facing no complications (Paul and Rumsey, 2002). Another study in India found that a woman who had a stillbirth in the past was about 75-80 percent more likely to deliver the child in an institution compared to those who had not experienced any stillbirth (Navaneetham and Dharmalingam, 2002). In a population based, cross-sectional study of 255 women aged 16-54 in rural Zimbabwe, the most important significant determinants of increased likelihood of hospital delivery were the use of maternity waiting shelters (Odds Ratio (OR)=5.8) and complication during the last pregnancy (OR=2.0) (van den Heuvel *et al.*, 1999).

Experience with antenatal care provided by health workers can also influence the decision on the utilization of health facilities for delivery. An association between the use of antenatal care and health facility delivery was observed in Ethiopia (Kwast and Liff, 1988), Uganda (Amooti-Kaguna and Nuwaha, 2000), India (Bloom, Lippeveld and Wypij, 1999) and Zaire (Dujardin *et al.*, 1995). For instance, in a sample of 300 low to middle income women who had given birth in India, women with high level of antenatal care use were much more likely to use safe delivery care than those with low level of antenatal care (73 percent and 22.7 percent respectively). Similar results were obtained for women delivering in a health facility relative to those delivered at home (odd ratio of 1.89) (Bloom, Lippeveld and Wypij, 1999). Nevertheless, studies indicated that while the antenatal care utilization is high (between 85-95 percent), the percentage of women delivering in medical facilities is considerately lower. This suggests that the quality of visits is more important than the actual number of antenatal care visits (Munjanja, Lindmark and Nystrom, 1996, Menown, Arehbold and Wills, 1993)..

2.1.8 Influence of husband/partner and close relatives

Social pressure especially from spouses and other relatives has emerged as an important factor influencing the choice of delivery site (Amooti-Kaguna and Nuwaha, 2000). The delay in care-seeking might be compounded by male-dominated decision making, especially in a patriarchal and patri-local family structure. The dependence of women on their husbands and senior household members have pertained them to seeking health care (Fikree *et al*, 2004). However, the influence of intentions and practices of men and close relatives on conception, pregnancy, and

childbirth outcome have not been thoroughly investigated in both developed and developing countries (Dudgeon and Inhorn, 2004).

In Benin, antenatal care was sought when symptoms of complications were experienced, but women had to negotiate with their husbands to pay for the visit. Women were sometimes refused care on a return visit if they had not purchased all the medicines prescribed, probably because they did not have enough money. (Grossmann-Kendall *et al.*, 2001). Studies in the US indicated that adequate antenatal care utilization can be influenced by the mother's relationship with father (Schaffer and Lia-Hoagberg, 1997, D'Ascoli *et al.*, 1997).

In Peru, education of husband has a net effect on service utilization. Similarly, in the Philippines, education was an important predictor of prenatal care in urban and rural areas. In urban areas, each year of husband's education would increase the odds that the wife received some prenatal care by nine percent and of adequate care by 14 percent (Becker *et al*, 1993). Husband's education may operate primarily as a proxy for economic well-being of the household as well as their attitudes towards modern medicine (Elo, 1992).

In Nigeria, women are economically and socially dependent on their husband because of lack of access to production, despite they provide most of the farm labour. Consequently, women have to seek their husband's permission to obtain any treatment that may be costly. Whenever the husband is not available, a close kinsman has to make the decision considering the financial burden that it may induce (Asowa-Omorodion, 1997). In Bolivia, the education level of the grandmother can significantly influence the number of antenatal care visits and the delivery location for women (Bender and McCann, 2000). Uzma et al reported that in complicated deliveries, often the mother or mother-in-law is the decision maker (Uzma *et al*, 1999).

Hierarchy of power at home plays a central role in determining where women gave birth. At home, birth care fell within the domestic domain and TBAs cost next to nothing, so women were able to have a voice in deciding which TBA would deliver the baby. However, maternity care tended to be a less important issue within the

household, women had very little control over the choice of delivery venue because of their economic and social dependence on men, a situation that was also influenced by socio-economic status (Afsana and Rashid, 2001). In patriarchal societies, women are generally left out of the decision making process even on issues that pertain uniquely to them. Studies in developing countries suggested that the decision regarding delivery is generally made at an early stage of pregnancy. Generally, the head of the household makes the decision and selects the place for delivery with or without consulting other adult family members (Bhardwaj and Paul, 1986, Paul, 1991, Paul, 1992).

2.1.9 Perceived quality vs. utilization of maternal services

2.1.9.1 Quality of care concept

Quality of care can be assessed on the basis of structure, process, and outcome (Donabedian, 1980). Structural data are characteristics of physicians and hospitals. Process data are the components of the encounter between a physician or another health care professional and a patient. Outcome data refer to the patient's subsequent health status.

Quality of health care services can be defined by either individual patient or population perspectives (Campbell, Roland and Buetow, 2000). The former could be defined as 'whether individuals can access the health structures and processes of care which they need and whether the care received is effective'. The latter could be defined as 'the ability to access effective care on an efficient and equitable basis for the optimisation of health benefit/well-being for the whole population'. While quality of care for an individual refers to information which is context specific to that user, a societal perspective requires information about all potential users of health care and this requires a consideration of opportunity cost. Quality under this perspective includes two domains of quality: access and effectiveness. At the population level, quality consists of three additional factors, namely equity, efficiency, and cost (Campbell, Roland and Buetow, 2000)

The assessment of quality of services has posed a great challenge for researchers and practitioners in an attempt to improve the efficiency and effectiveness of the primary health care. In the current literature, evaluation studies deal with quality according to

the 'technocratic' perspective of health care professionals or lay perspective of clients and communities (Wouters, 1991). In the former, quality of services is judged to be good as long as they reach defined standards representing the perspective of health professionals (Roemer and Montoya-Aguilar, 1988, Brook, McGlynn and Cleary, 1996, Brook, McGlynn and Shekelle, 2000). In the latter, clients play a central role in the definition and assessment of quality of health care (Donabedian, 1988, Williams, 1998, Calnan, Dickinson and Manley, 1999, Calnan, 1998, Larrabee, 1995).

Client satisfaction is defined as a health care recipient's reaction to the salient aspects of his/her service experience (Pascoe, 1983). In this definition, satisfaction is assumed to consist of a cognitive evaluation and an emotional reaction to the structure, process, and outcome of services. Satisfaction evaluation differs from patient's reports about objective characteristics of their care. For instance, to evaluate physician communication, researchers might ask patients how satisfied he/she with the amount of information provided. Alternatively, one might ask a patient to report about the possible adverse reaction to a drug. In other words, patient satisfaction is discussed in terms of their own *evaluation* rather than *reporting* on the quality of service.

Client satisfaction has been widely used in the lay measurement of quality of health services. Despite its benefits, there has been growing criticism of its measurement. Satisfaction ratings reflect the personal preferences of the client, the client's expectations, and the realities of the received care, the latter can be affected by different components of that care (Sitzia and Wood, 1997). Satisfaction ratings, being both a measure of care and a reflection of the respondent, therefore do not reflect objective reality. To overcome this problem, some organizations emphasize the measure of client perception instead. For example, the Joint Commission on Accreditation of Healthcare Organization has replaced the term 'satisfaction' with 'perception of service' (Joint Commission on Accreditation of Healthcare Organizations, 1999).

Client-perceived quality is a subjective, dynamic perception of the extent to which expected health care is received (Larrabee and Bolden, 2001). Rosenthal et al

(Rosenthal and Shannon, 1997) and Haddad et al (Haddad *et al.*, 2000) pointed out the advantages of perceived quality measurement. Firstly, patients offer a unique perspective for evaluating the non-technical aspects of medical care (Epstein *et al.*, 1996) and client-perceived quality could be directly associated with other quality measurement such as health worker's assessment (Nelson *et al.*, 1989). Secondly, client-perceived quality could be more sensitive to differences across the service delivery networks than other quality measures such as complication rates or adjust-mortality rates (Rosenthal and Shannon, 1997). In addition, it is less expensive and more reliable, and does not depend on completeness and accuracy of medical records (Davies and Ware, 1988). Thirdly, client-perceived quality can reflect positive aspects of provided services and better complement newer models of quality improvement. Fourthly, client perception of service quality could influence health seeking behaviours, utilization of services, compliance to recommended treatment and the service outcome (vom Eigen, Delbanco and Phillips, 1998).

2.1.9.2 Influence of client's perceived quality on services utilization

The influence of client's perceived quality of maternal services on utilization has been addressed in several studies. In Mauritania, a positive linkage was found between the overall level of utilization of basic services and improvement of the quality of health care, and users were willing to pay when the quality of health care improved (Audibert and Mathonnat, 2000). In Ghana, women with obstetric complications will utilize emergency obstetric services if they believe them to be of high quality (Djan *et al.*, 1997b). Similarly, a study in China showed that introducing a village doctor responsible for maternal and child health was associated with a higher utilization of prenatal care and the use of health care facility for delivery (Anson, 2004). Women are less likely to use prenatal care services or use it late in their pregnancy, despite the availability of nominally free public facilities, suggesting that poor quality of prenatal care services in public facilities can discourage the use of these services (Gertler *et al*, 1993).

Dissatisfaction with the quality of services drove women to seek other maternal service alternatives. In Nigeria, patients were prepared to accept less clinically effective service in the community, in exchange for freedom to have their baby in any set-up other than the obstetrics unit of the hospital (Gharoro and Igbafe, 2000,

Gharoro and Okonkwo, 1999). Moreover, rural women preferred private obstetric services to public services because private services were more accessible and flexible for payment schedules, and doctors were readily available (Chukudebelu *et al.*, 1997). In Bangladesh, private hospitals were evaluated better on responsiveness, communication, and discipline than public hospitals, while quality perceptions were driving patients to private hospitals (Andaleeb, 2000). In South Africa, women's decisions were influenced by a variety of factors including perceived quality of maternal services. Women often expressed their unwillingness to spend a long time waiting in the facility and therefore, tried to stay home until delivery (Abrahams, Jewkes and Mvo, 2001).

Interpersonal relations between providers and clients can also influence client's perceived quality and utilization of service. In Lebanon, nearly all women based their choice of provider on their previous experience and rated physicians by the extent of being 'close' to one's heart' (Kabakian-Khasholian *et al*, 2000). In Uganda, rural women had negative feelings towards providers of maternity care at government health facilities, and expressed doubts about the efficacy of specific therapies. Health workers were said to be rude, poorly trained and unwilling to dispense prescribed drugs. They were also perceived as deliberately avoiding maternity patients, and abandoning them in critical conditions, as well as expecting to be bribed, giving false information, and lacking ethics. Consequently, most mothers said they only went to the hospital or health centre as a last resort in the event of emergency (Kyomuhendo, 2003).

At government hospitals, women felt that health staff were rude and unhelpful, and made them wait for hours before receiving any services. On the other hand, TBAs play a significant role during and after childbirth, particularly in providing neonatal care and doing household chores. In addition, at home births, women are surrounded by family members and receive special care (Afsana and Rashid, 2001). TBAs were known or seen as fellow community members and their services were familiar and acceptable in the community (Kyomuhendo, 2003). Women often chose the services of TBA even though clinic and hospital services were available and accessible, indicating that health professionals must learn from TBAs to create more cultural acceptable and respectful ways to care for women. TBAs are more financially

accessible and also provide other essential support services such as helping with household chores and looking after children (Donnay, 2000). It has been suggested that women planning home birth often weight the issue of control whereas women planning hospital births weight safety instead (Schiff and LaFerla, 1985).

2.1.9.3 Measurement of perceived quality of health care service

Although clients may not have sufficient knowledge to evaluate provided services, perception of service quality has been increasingly used in health care evaluation, resulting in a need to develop valid instruments to monitor the level of quality perceived by clients (Barrio *et al.*, 2002). While qualitative methods were preferred in some studies (Langer *et al.*, 1998, Bender *et al.*, 2001, Radwin, 2000, Wallace *et al.*, 2002, Larrabee and Bolden, 2001), multidimensional scales have been developed to measure client-perceived quality (Clemes, Ozanne and Laurensen, 2001, Drain, 2001, Pouwer and Snoek, 2002, Zifko-Baliga and Krampf, 1997, De Man *et al.*, 2002, Webb *et al.*, 2001, Haddad *et al*, 2000, Haddad, Fournier and Potvin, 1998, Baltussen *et al.*, 2002, Andaleeb, 2001, Bryce *et al.*, 1992). Multidimensional scaling is a multivariate approach appropriate for measuring perceptions and preferences of clients in health care studies (Dunfield, 1996, Green, Donald and Albaum, 1988).

There have been very few studies on the development of a multidimensional scale to measure perceived quality of care in the context of developing countries. Andaleeb (Andaleeb, 2001) investigated five dimensions of perceived quality of care: responsiveness, assurance, communication, discipline, and baksheesh - an amount of 'bribe money' paid to health staff. Haddad et al (Haddad, Fournier and Potvin, 1998) developed and validated a 20 item instrument categorized into three dimensions: 'health care delivery', 'personnel' and 'health facility' which had demonstrated good reliability and validity. Baltussen et al (Baltussen *et al*, 2002) had further tested this scale in the Burkina Faso's context with some modifications. The modified scale was categorized into four dimensions, namely 'health personnel and conduct', 'adequacy of resources and services', 'health care delivery', and 'financial and physical accessibility of care'. However, no study has specifically examined such instruments in the context of maternal health services.

2.1.10. Client's preference of maternal services

Some studies on the utilization of health care services have investigated hypothetical cases in which respondents are presented with all relevant information and asked to decide their preference and their willingness-to-pay for their preferred services. Some early evidence showed that the willingness-to-pay approach could be able to predict the utilization of services (Foreit and Foreit, 2003).

2.1.10.1. Concept of willingness-to-pay

The use of willingness-to-pay to measure program benefits has been popular in many areas of applied economics. Recently, there has been an increasing interest in willingness-to-pay when undertaking economic evaluations of health care (Liljas and Blumenschein, 2000). Typically, when using willingness-to-pay, the benefits of health care services are estimated in monetary terms. Willingness-to-pay attempts to determine how much individuals are prepared to pay to reduce their risk of mortality and morbidity. In this context, pay is a measure of what a client is willing to forego rather than the actual amount of money. The more one is willing to forego for a service, the more he/she values the quality of the service (Donaldson, Hundley and Mapp, 1998). Therefore, the maximum amount that a client is willing to pay could be used as an indicator of the utility or satisfaction derived by individuals from health services (Ryan, Ratcliffe and Tucker, 1997).

Willingness to pay refers to a method of valuing the benefits of health services with surveys using hypothetical scenarios (Johannesson *et al.*, 1997, Donaldson, 2001). It is one way of simulating a 'missing market' (Liljas and Blumenschein, 2000). In willingness-to-pay studies, four main techniques have been used to assess the maximum willingness-to-pay; namely open-ended, bidding, payment cards, and closed-ended or discrete-choice (Ryan, Ratcliffe and Tucker, 1997, Smith, 2000, Stewart *et al.*, 2002). Each elicitation method has its own pros and cons. There is still controversy about which method is the best to use in willingness-to-pay studies (Gibb, Donaldson and Henshaw, 1998, Donaldson, 2001, Donaldson, Hundley and Mapp, 1998).

Willingness-to-pay appears to be a 'theoretically correct' approach because of its foundation in welfare economics (Pauly, 1995). There is no restriction on attributes

of an intervention to be used in willingness-to-pay measurements to express a value (Donaldson and Shackley, 1997). Furthermore, since money is adopted as the unit of valuation of benefits, the willingness-to-pay approach can be used to assist policy makers to set up appropriate price for health care services (Foreit and Foreit, 2003), and improve allocative efficiency (Drummond, Stoddart and Torrance, 1987).

2.1.10.2. Using willingness-to-pay to measure preferences of maternal services

Despite the advantages of willingness-to-pay, uncertainties about reliability and validity have limited its use by health care decision makers (Liljas and Blumenschein, 2000, Klose, 1999). A literature search showed that very few willingness-to-pay studies in the health care context have been conducted in developing countries, and they were mainly restricted to African nations (Onwujekwe, 2001, Onwujekwe *et al.*, 1998, Forsythe *et al.*, 2002, Onwujekwe and Nwagbo, 2002). The number of willingness-to-pay studies in the area of reproductive health in general, and on maternal services in particular, is still very modest (Donaldson, Hundley and Mapp, 1998, Foreit and Foreit, 2003, Ryan, Ratcliffe and Tucker, 1997, Gibb, Donaldson and Henshaw, 1998).

In valuing alternative models of antenatal care (practitioner/midwife led care versus obstetrician led care) in the United Kingdom, a willingness-to-pay of £2,500 for antenatal care had been reported, with no significant difference between the types of care provided (Ryan, Ratcliffe and Tucker, 1997). Another study was conducted in the United Kingdom to assess the feasibility of a willingness-to-pay instrument to measure the benefits of intrapartum care (a midwife-managed delivery unit versus care in a consultant-led labor ward). It found that 55 percent of women expressed a preference for care in a midwives unit. The willingness-to-pay results were not associated with ability to pay (Donaldson, Hundley and Mapp, 1998).

In summary, factors influencing the utilization of maternal services include socio-demographic, access to services, costs, cultural and traditional childbirth practices, maternal experiences of mothers, influence of men and close relatives, and perceived quality of services. For a country like Vietnam where the facility based delivery rate needs to be improved, studies on these factors are vital in order to improve the effectiveness and efficiency of the health care delivery network.

2.2. Factors influencing breastfeeding

2.2.1 Trends in breastfeeding

Amongst infants aged six months or younger in the developing countries, the prevalence of exclusive breastfeeding is 38.7 percent and the prevalence of no breastfeeding is 5.6 percent. The prevalence of continued breastfeeding is reported to be 86 percent and 68 percent for infants and children aged 6-11 months and 12-23 months, respectively. In Asia, the prevalence of exclusive breastfeeding is about 45 percent while the partial breastfeeding rate is 51 percent within the first six months postpartum. About 5 percent of infants aged less than six months are not breastfed. The current trends of breastfeeding are presented in Table 2.2.1 (reproduced from Lauer *et al.*, 2004).

2.2.2 Benefits of breastfeeding

Advantages of breastfeeding for infants, mothers, families and societies have been well documented in the literature. Its benefits are summarized below.

2.2.2.1 Advantages for infants

Research has demonstrated the significant nutritional, developmental, psychological, immunologic, social, economic and environmental benefits of breastfeeding to infants. Epidemiologic research has provided evidence specifically related to infant health that breastfeeding may:

i.   enhance cognitive development (Oddy *et al.*, 2003a) and neurodevelopment (Vestergaard *et al.*, 1999) .

ii. decrease the incidence or severity of several conditions including diarrhoea, (Beaudry, Dufour and Marcoux, 1995, Scariati, Grummer-Strawn and Fein, 1997), respiratory infection (Beaudry, Dufour and Marcoux, 1995, Wilson *et al.*, 1998, Oddy *et al.*, 2003b), asthma (Oddy *et al.*, 1999, Oddy and Peat, 2003, Oddy, 2000), and otitis media (Scariati, Grummer-Strawn and Fein, 1997).

iii. protect against sudden infant death syndrome (Ford *et al.*, 1993, Alm *et al.*, 2002), insulin-dependent diabetes mellitus (Gimeno and de Souza, 1997),

Crohn's disease (Koletzko *et al.*, 1991), lymphoma, and leukemia (Shu *et al.*, 1995, Shu *et al.*, 1999, Mathur *et al.*, 1993a).

Table 2.2.1: Prevalence estimates for breastfeeding indicators, by sub-region and age group

Region	Breastfeeding indicators						
Sub-region	Infants <six months of age			Infants 6-11 months of age		Infants 12-23 months of age	
	Exclusive	Partial	No	Continued	No	Continued	No
Africa	**24.1**	**71.2**	**3.9**	**91.8**	**8.2**	**69.9**	**30.1**
Eastern	41.4	56.1	2.4	95.1	4.9	75.6	24.4
Middle	19.4	79.6	1.0	96.6	3.4	76.8	23.2
Northern	36.5	53.9	9.6	77.7	22.3	49.6	50.4
Southern	8.2	75.7	16.0	70.4	29.6	46.7	53.3
Western	6.1	92.1	1.8	96.8	3.2	74.9	25.1
Asia (excl Japan)	**44.9**	**50.7**	**4.5**	**87.5**	**12.5**	**72.4**	**27.6**
Eastern	58.6	36.3	5.1	85.7	14.3	-	-
South Central	42.1	55.3	2.6	93.3	6.7	78.8	21.2
South Eastern	37.5	55.0	7.5	76.7	23.3	61.7	38.3
Western	17.7	72.0	10.3	71.3	28.7	37.3	62.7
Latin America & Caribbean	**30.8**	**51.2**	**18.0**	**59.9**	**40.1**	**36.5**	**63.5**
Caribbean	25.8	63.8	10.4	64.6	35.4	34.2	65.8
Central America	23.4	55.0	21.6	60.2	39.8	37.0	63.0
South America	35.1	48.0	16.9	59.3	40.7	36.4	63.6
Developing countries	**38.7**	**55.7**	**5.6**	**85.8**	**14.2**	**68.3**	**31.7**

Notes: The region Oceania (including developing countries Guam, Fiji, French Polynesia, New Caledonia, Papua New Guinea, Samoa, Solomon Islands and Vanuatu) was excluded as nationally representative breastfeeding data were not available for any countries in Oceania).
Source: Lauer *et al* (2004)

2.2.2.2 Advantages for mothers

A number of studies have demonstrated the maternal health benefits of breastfeeding, such as:

i. decreased postpartum bleeding and more rapid uterine involution (Chua *et al.*, 1994).

ii. delayed resumption of ovulation resulting in increase child spacing (Kennedy and Visness, 1992)

iii. an earlier return to pre-pregnant weight (Dewey, Heinig and Nommsen, 1993),

iv. a possible reduced risk of ovarian cancer (Siskind *et al.*, 1997) and breast cancer (Newcomb, 1997, Newcomb *et al.*, 1999, Zhang *et al.*, 2004).

2.2.2.3. Advantages to families and societies

i. economic saving from cost of purchasing infant formula (American Dietetic Association, 2001, Ball and Bennett, 2001, Montgomery and Splett, 1997, Riordan, 1997, Gupta and Khanna, 1999, Fok, Mong and Chua, 1998)

ii. reduced employee absenteeism related to child illnesses (American Academy of Pediatrics, 1997, Cohen, Mrtek and Mrtek, 1995)

iii. reduced health care costs because of fewer physician and hospital visits (Riordan, 1997, Smith, Thompson and Ellwood, 2002)

Because of these advantages, the World Health Assembly passed a resolution recommending exclusive breastfeeding for the first six months of life as a global public health recommendation in 2001 (WHO, 2001). International consensus is that optimal breastfeeding practice for infants and young children consists of exclusive breastfeeding for the first six months of life with continued breastfeeding up to two years of age and beyond.

2.2.3 Decision making model for breastfeeding

Martens and Young described a decision making model for breastfeeding choice and duration which is outlined in Figure 2.2.1. In this model, the constructs of 'beliefs' (a measure of attitudes), and 'referent support' (a measure of subjective norm) are directly associated with the intent to breastfeed. Parallel to 'beliefs' and 'referent support' is the 'confidence' construct. 'Confidence' is considered as a different construct from 'beliefs'. For example, a woman may believe that breastfeeding is superior for infant nutrition, but she may not feel capable to breastfeed her infant. Confidence refers to 'self-efficacy', i.e. the confidence a person feels about

performing a specific activity, in this case, breastfeeding. This construct may be useful in identifying 'barrier to breastfeeding'. Mediating factors, called 'resources',

Figure 2.2.1: A breastfeeding decision-making model

Source: Martens and Young (1997)
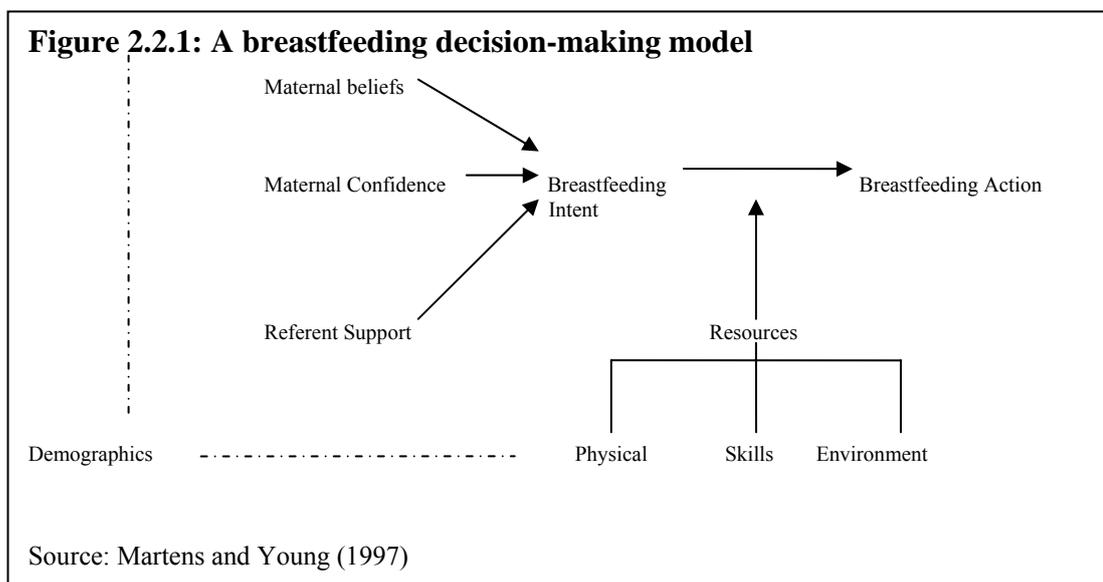
are considered beyond the control of the decision maker. There are three resources: a supportive environment, the physiologic requirements of breastfeeding, and knowledge of the skills of breastfeeding. Demographics can be the underlying conditions which could possibly affect beliefs, confidence and referent support as well as resources. The outcome measures of 'breastfeeding behaviour' include infant feeding choice and breastfeeding duration (Martens and Young, 1997).

Bentley, Dee and Jensen suggested two level factors that influence breastfeeding decision; see Figure 2.2.2. The macro-level factors, such as media, aggressive marketing of breast milk substitutes, welfare reform, hospital policy and breastfeeding legislation interact with micro-level factors to influence a woman's decision to breastfeed. These micro-level factors include features of the community, neighborhoods, workplaces that support or discourage breastfeeding, social and personal networks and cultural norms and individual beliefs about breastfeeding (Bentley, Dee and Jensen, 2003).

Figure 2.2.2: Social ecological framework of breastfeeding
Source: Bentley, Dee and Jensen (2003)
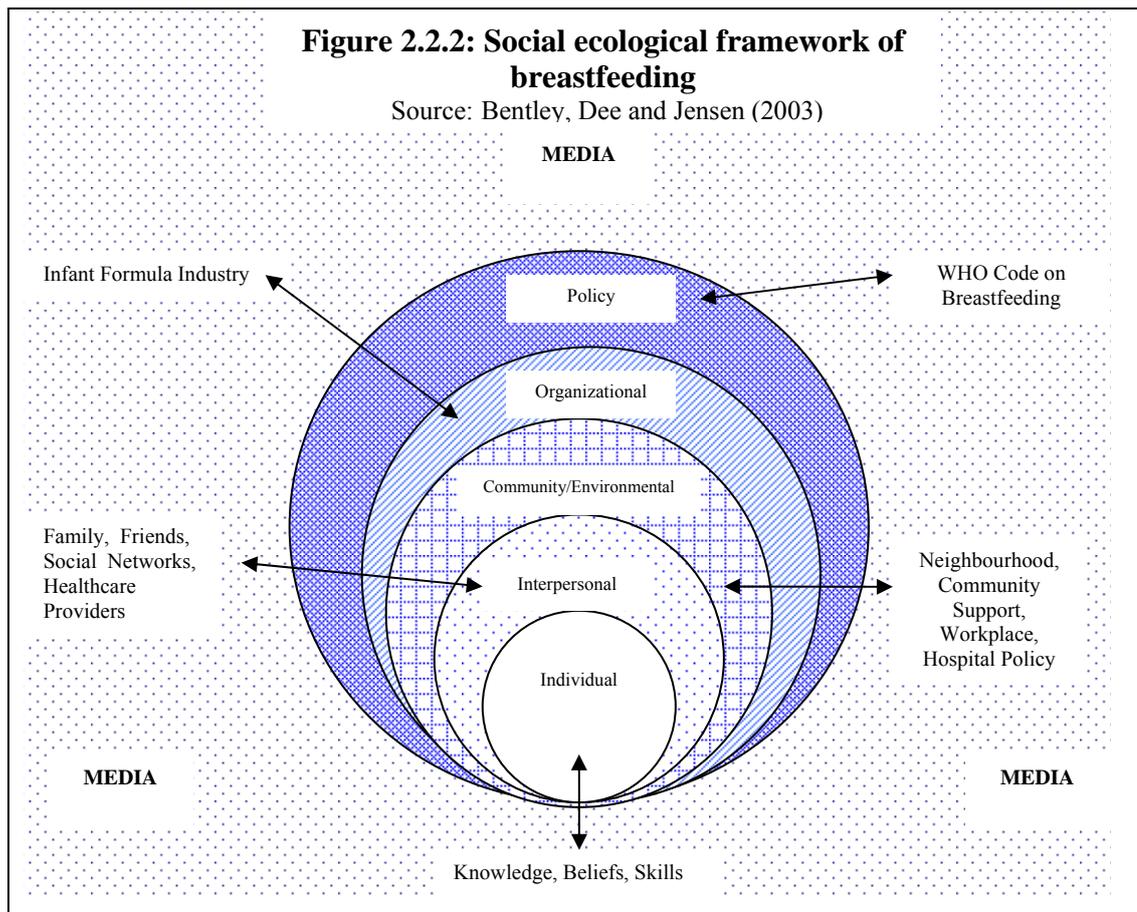
2.2.4. Personal characteristics

2.2.4.1. Maternal age

Internationally, maternal age has been repeatedly associated with the initiation and duration of breastfeeding. Older women are more likely to initiate and continue breastfeeding than younger mothers. In a study of 350 New Zealand women, younger women were at a greater risk for shorter breastfeeding duration (relative risk=2.33) (Vogel, Hutchison and Mitchell, 1999). In Canada, Dubois and Girard found the probability of being breastfed exclusively at four months is 3.1 times higher for children of mothers aged 25-29 years, 4.7 times higher when the mothers are 20-34 years and reaches 5.7 times highest when the mothers are 35-39 years, comparing to women who are less than 25 years old (Dubois and Girard, 2003). Similarly, Ryan in a national survey of 916,000 American women during 1989 and 1995 indicated that younger women were significantly less likely to breastfeed than older women (Ryan, 1997).

Similar results were found in developing countries (Awang and Salleh, 2000, Dodgson *et al.*, 2003, Leung *et al.*, 2003). Five-hundred mothers with singleton pregnancies and healthy infants were interviewed at six weeks post-partum in Malaysia, where mothers over 27 years were 1.48 times more likely to exclusively breastfeed than their younger counterparts (Chye *et al.*, 1997).

2.2.4.2. Socio-economic status

In the literature, socio-economic status was measured by household income, level of education, and/or occupation. Higher socio-economic status has been positively associated with breastfeeding initiation and duration in developed countries (Barber *et al.*, 1997, Hunkeler *et al.*, 1994, Ryan, 1997).

Although breastfeeding is positively associated with socio-economic status in most developed countries, the relationship appears to be negative in developing countries. Educated mothers are more likely to be involved in economic activity away from the home (Davies-Adetugbo and Ojofeitimi, 1996). In Nigeria, Davies-Adetugbo and Ojofeitimi reported that mothers with some formal education are also more likely to start feeding human milk substitutes at two weeks (OR = 3.83, p-value<0.01). Better education and labour force participation among women may enhance their economic status, but at the same time lead to the abandonment of breastfeeding. Lifestyle changes as influenced by the mass media, modern health sectors, and the increased availability of modern consumer goods will affect the mother's decision to initiate, continue or terminate breastfeeding (Abada, Trovato and Lalu, 2001, Rogers, Emmett and Golding, 1997). The decline in the initiation and duration of breastfeeding is inevitable as a result of the modernization process (Adair, Popkin and Guilkey, 1993).

2.2.4.3. Ethnicity

Ethnicity was found to be a determinant of breastfeeding duration in Malaysia (Awang and Salleh, 2000) and Bolivia (Ludvigsson, 2003b). Differences in the incidence of breastfeeding are apparent among various ethnic groups in North America. The breastfeeding rate among African and Hispanic women was lower than that of White women (Colley Gilbert *et al.*, 1999, Bentley, Dee and Jensen, 2003). In

addition, no difference in breastfeeding rates between low-income ethnic groups have suggested that socio-economic status may have more impact on breastfeeding behaviour than ethnicity (Piper and Parks, 1996, MacGowan *et al.*, 1991).

2.2.4.4. Smoking status

The association between maternal smoking and lack of breastfeeding is consistent across countries (Amir and Donath, 2002, Sayers *et al.*, 1995). Smoking status is a significant predictor of breastfeeding behaviour. A study among 6747 Hong Kong Chinese infants found that both maternal and paternal smoking were associated with not initiating breastfeeding (ORs for ever maternal smoking = 2.51 and for ever paternal smoking = 1.22 respectively) (Leung, Ho and Lam, 2002). In a study of 500 Jordanian mothers, smoking had a direct effect on breastfeeding after adjustment for maternal smoking and other confounders. The prevalence of breastfeeding reduced significantly among smokers but there was no significant reduction among non-smokers (Najdawi and Faouri, 1999). In the United States, tobacco use during the prenatal period was significantly associated with failure to exclusively breastfeed at about two weeks of age; adjusted OR = 2.08 (Letson, Rosenberg and Wu, 2002).

A longitudinal study of 796 women delivering in five hospitals in Canada found that mothers who had smoked during part or all of their pregnancy and were smoking at the time of the interview, were significantly more likely than non-smokers to bottle-feed at birth or to discontinue breastfeeding and introduce solid food by 12 weeks (Edwards, Sims-Jones and Breithaupt, 1998). Moreover, women who smoked were more apt to stop breastfeeding early (Hill and Aldag, 1996). In a meta-analysis of maternal smoking on early weaning, the random effects odds ratio for weaning before three months was 1.93 for smoking relative to non-smoking mothers (Horta, Kramer and Platt, 2001).

Several studies have found a dose-response relationship between the number of cigarettes smoked each day and breastfeeding intention, initiation, and duration that persists after adjusting for confounding factors. In a population-based birth cohort study of 1,098 Brazilian infants, compared with nonsmokers, mothers smoking 20 or more cigarettes daily presented an odds ratio of 1.94 for breastfeeding for less than

six months (Horta *et al.*, 1997). Similar results were reported in a study in England (Clements *et al.*, 1997).

2.2.4.5. Maternal employment

Studies have demonstrated a negative association between duration of lactation and maternal employment (Gielen *et al.*, 1991, Lindberg, 1996). In Kenya, the prevalence of exclusive breastfeeding was 13.3 percent at three months. Early introduction of complementary foods was high, with 46.4 percent of the mothers introducing other foods before one month. Return to work was the main reason cited for the cessation of exclusive breastfeeding (Lakati, Binns and Stevenson, 2002). Rising female labour force participation and increased labour market continuity among women may interfere with successful initiation, duration and intensity of breastfeeding, despite public health emphasis on the importance of breastfeeding (Roe *et al.*, 1999). In a study of 9,087 American women, the decision to breast-feed was not associated with maternal employment. However, among breast-feeders, returning to work within a year of delivery was associated with a shorter duration of breastfeeding when other factors were accounted for. Among employed mothers, the duration of maternity leave was positively associated with the duration of breastfeeding (Visness and Kennedy, 1997).

A longitudinal study conducted in the United States found that expecting to work part-time neither decreased nor increased the probability of breastfeeding relative to expecting not to work, but expecting to work full-time decreased the probability of breastfeeding. Working full-time at three months postpartum decreased breastfeeding duration by an average of 8.6 weeks relative to not working, but part-time work of four or fewer hours per day did not affect duration, and part-time work of more than four hours per day decreased duration less than full-time work (Fein and Roe, 1998).

In a study of 230 Brazilian women, those did not work outside the home intended to breast feed significantly longer than those who were employed (Paine and Dorea, 2001). Similarly, the duration of exclusively breastfeeding was longer among Brazilian women with support for breastfeeding at work, and shorter for those working on weekends or doing shift work (Rea *et al.*, 1999). In Thailand, the resumption of employment generally had negative effects on breastfeeding rates and

duration. At six months postpartum, women who worked inside the home breastfed more than those working at jobs with inflexible hours (home, 80 percent; public sector, 37 percent; private sector, 39 percent). Women who were working outside the home for a long period or had shift jobs encountered many obstacles to maintain breastfeeding, and most gave it up within one month after resuming employment (Yimyam and Morrow, 1999).

A survey conducted in peri-urban Guatemala City reported that women who did not work outside the home were 3.2 times more likely (95%CI: 1.6-6.4) to exclusively breast-feed than women who worked outside the home after controlling for infant's age and sex and mother's ethnicity (Dearden *et al.*, 2002a).

Breastfeeding and working outside the home are commonly believed to be incompatible. For a woman working outside the home to provide her baby with breast milk, she must have the place and time to nurse the baby or express and store her milk for bottle feeding. In Indonesia, to practise breastfeeding while having agricultural work during early infancy period, women had either to bring their infants to the field or to work within earshot so that they can quickly return to their infants (Launer, 1993).

However, unlike most previous research, maternal employment was not a statistically significant factor affecting the length of continued breastfeeding, according to a longitudinal self-report study undertaken in Hongkong (Dodgson *et al*, 2003).

The workplace can be a barrier for the mother who decides to breastfeed. Legislative efforts have been put into place to protect women's right to breastfeed after returning to work, and encourage employees to provide a safe, private environment for women to express or pump breast milk (Meek, 2001). However, understanding by women with regard to the law that protect breastfeeding was limited in some places. For example, in Papua New Guinea, 64 percent of women in paid employment were not aware of their entitlement of 2.5 hours breastfeeding breaks according to the Employment Act. Child-minding facilities were virtually non-existent, less than five percent of the employed mothers reported such facilities were available (Friesen *et al.*, 1998).

2.2.5 Attitudinal and intra-personal characteristics

2.2.5.1. Prenatal intentions

Studies indicated that breastfeeding behaviours are strongly associated with the timing of the decision to breastfeed. In general, the earlier the decision is made to breastfeed, the greater the likelihood of initiation and longer duration. If during pregnancy, ambivalence is expressed about whether to breastfeed, the likelihood of weaning in the early weeks after birth is greatly increased (Wiemann, DuBois and Berenson, 1998).

In a prospective study of infants from birth to 12 months of age in New Zealand, the intention to breastfeed increased with the likelihood of successful breastfeeding initiation (Heath *et al.*, 2002). A consistent association has been found between intended and actual duration of breastfeeding. In a study of 78 primiparas in Australia, those fully breastfeeding three months after the birth of the baby had timed their decision to breastfeed earlier, intended to breastfeed longer and had a more negative attitude to formula feeding. Commitment and confidence scores were not related to breastfeeding duration in first-time mothers (Lawson and Tulloch, 1995). In the United States, intended length of breastfeeding accounted for 18 percent of the variance in the duration of breastfeeding while mothers' age and nine percent, and mothers' education three percent (Quarles *et al.*, 1994).

A study of seventy-four American women found that compared with women planning to exclusively breastfeed their infants, those did combination feed planned shorter breastfeeding duration (p-value<0.01), reported shorter actual duration (p-value<0.01), and were less likely to meet their breastfeeding goal (p-value<0.01) (Chezem, Friesen and Boettcher, 2003).

In a longitudinal cohort study of 10,548 women in the United Kingdom, prenatal intention to breastfeed had an influence on both initiation and duration of breastfeeding. Of the women intending to bottle feed from birth, only 3.4 percent initiated breastfeeding, compared with 96.6 percent of women planning to breastfeed for at least four months. At six months postpartum, the mean duration of breastfeeding for women intending to breastfeed for at least five months was 4.4

months, compared with 2.5 months for women with a prenatal intention to breastfeed for only one month. Logistic regression, using intended duration as the only explanatory variable, correctly predicted 91.4 percent of breastfeeding initiation and 72.2 percent of infant feeding at six months (Donath and Amir, 2003).

In a study of ninety-nine Thai working mothers in Northeast Thailand, a strong correlation existed between the women's planned duration of breastfeeding and the length of time she actually breastfed (Kaewsarn and Moyle, 2000).

2.2.5.2. Maternal attitudes

A longer duration of exclusive breastfeeding was significantly associated with positive maternal attitudes towards breastfeeding (Cernadas *et al.*, 2003, Tarkka, Paunonen and Laippala, 1999). A cross-sectional analysis of mothers' attitudes and infant feeding behavior in the United States indicated that maternal attitudes are better predictors of feeding method than are socio-demographic factors. Maternal attitudes concerning the process and product dimensions of infant feeding can provide valuable information regarding the women preference on either breastfeeding or formula-feeding (Dungy, Losch and Russell, 1994).

A study in Finland reported that when the child was three months old those women who perceived themselves competent as mothers, who felt that breastfeeding was important in motherhood, and who felt that society appreciated motherhood appropriately, coped better with breastfeeding (Tarkka, Paunonen and Laippala, 1999).

Conversely, women with negative breastfeeding attitudes such as perceptions of lifestyle restrictions, physical discomfort, and inconvenience, are more likely to bottle-feed (Matthews *et al.*, 1998, Heath *et al*, 2002). Exposure to breastfeeding, however, could be either a positive or a negative influence on the decision to breast feed, depending on the context. Women who had seen breastfeeding only by a stranger often described this as a negative influence, particularly if other people were present. Women of lower socio-economic status who perceive exposure to breastfeeding in a positive way may be more likely to initiate breastfeeding (Hoddinott and Pill, 1999). In cross-sectional interviews of Bolivian mothers with an

infant less than or equal to one year of age, attitudes of the mother, her partner (the infant's father) and the infant's grandmother towards breastfeeding did not influence the infant feeding pattern (Ludvigsson, 2003a).

2.2.5.3. Maternal confidence

In a study of 476 children under the age of three years conducted in Saudi Arabia, the most common reason for terminating breastfeeding during the first year was insufficient milk (30.9 percent) (Kordy *et al.*, 1992). In a prospective telephone survey of 300 women in the last trimester in Australia, mothers with high breastfeeding self-efficacy were significantly more likely to breastfeed, and doing so exclusively, at one week and four months postpartum than mothers with low breastfeeding self-efficacy (Blyth *et al.*, 2002).

Maternal breastfeeding confidence has been associated with perceptions of insufficient milk supply. Women with lower maternal confidence scores had a lower level of breastfeeding at six weeks postpartum (Hill and Humenick, 1996). Lower confidence in ability to breastfeed and less certainty in the decision to breastfeed were significant predictors of failure to breastfeed for more than seven days (Buxton *et al.*, 1991). Furthermore, breastfeeding knowledge was strongly correlated with breastfeeding confidence ($r = 0.262$; p-value<0.05) and actual lactation duration ($r = 0.455$; p-value<0.01) (Chezem, Friesen and Boettcher, 2003).

In a cohort study of 556 mothers resided in Perth, Western Australia, the levels of anxiety over milk supply reached 23 percent in the early stages of breastfeeding, and a number of mothers were still experiencing anxiety up to six months. Anxiety over the sufficiency of breastmilk supply often resulted in the cessation of breastfeeding (Binns and Scott, 2002).

2.2.6. Hospital policies and intra-partum experiences

2.2.6.1 Rooming-in

In the literature, rooming-in was found to be positively associated with initiation and continuation of breastfeeding (Centuori *et al.*, 1999, Froozani *et al.*, 1999, Gupta and Gupta, 1992). The separation of mother and infant can interfere with the

establishment of breastfeeding and increase the likelihood of complications (Rapley, 2002).

A study of 375 urban Nicaraguan primigravid women found a short 45-minute contact period and rooming-in combined with standard breastfeeding promotion resulted in greater initial rates and continuation of breastfeeding (p-value < 0.05). In populations where the majority of women initiate breastfeeding, post-partum mother-infant contact practices combined with standardized breastfeeding promotion may influence the initial choice to breast-feed, but these practices alone are clearly not enough to prolong breastfeeding (Lindenberg, Cabrera Artola and Jimenez, 1990).

Buxton et al (1991) found that women were three times more likely to discontinue breastfeeding if they did not room-in with their infants. Rooming-in is believed to be advantageous to breastfeeding because it promotes demand feeding (Buxton *et al*, 1991).

In a study of 700 randomly sampled infants in the United Kingdom, bed sharing practice in the two weeks before interview was associated with exclusively breastfeeding at discharge from the obstetric hospital (Clements *et al*, 1997). Breastfeeding duration was also related to the timing of the first breastfeed and extent of mother-infant contact in the 72 hours after birth but not to the number of feeding problems (Lawson and Tulloch, 1995).

A study in China reported that although knowledge on infant feeding was similar between mothers whose infants roomed with them after delivery and those without, the former infants tended to be breast fed earlier (p-value<0.01), to be given breast milk as their first food (p-value<0.01), to continue to be breastfed even when breast milk was perceived to be inadequate (p<0.01), to have received colostrum (p-value<0.01), to be breastfed longer (p-value<0.01), and to be exclusively breastfed longer (p<0.01) (Guldan *et al.*, 1995). However, rooming-in practices were not significantly associated with breastfeeding in western countries with lower overall rates of breastfeeding (Giovannini *et al.*, 2001, Loughlin *et al.*, 1985). .

In Vietnam, a negative influence of rooming-in on breastfeeding has never been reported, probably because the cultural norm in Vietnam is for the baby to remain with the mother and only rarely are mothers and infants separated.

2.2.6.2. Supplementary feeding

Supplementary feeding with infant formula during the first few days after birth has been associated with an increased risk of breastfeeding failure. The early introduction of supplemental bottles of artificial milks was associated with a decrease in the amount of human milk as well as with early weaning (Hill *et al.*, 1997), while restricting the use of glucose water in the first days of life could increase the probability of successful breastfeeding (Martin-Calama *et al.*, 1997). In a cross-sectional survey of 227 Canadian women, infants who did not receive supplementation in hospital were 2.49 times more likely than infants who received supplementation to breastfeed for at least six weeks (Sheehan *et al.*, 1999).

2.2.6.3. Early hospital discharge

Studies showed that the effect of early hospital discharge on breastfeeding initiation and duration is not well established. Meanwhile, parenting outcomes, such as breastfeeding, mother-infant interaction, and attachment, are not influenced by early perinatal hospital discharge (Britton, Britton and Gronwaldt, 1999). In New Zealand, even for the case of preterm infants, early discharge from hospital once a preterm infant can take full oral feeds does not alter later breastfeeding rates if adequate nursing support is available (Gunn *et al.*, 2000). Women with a short stay remained slightly more likely to terminate breastfeeding than women with a standard stay (relative risk, 1.11, 95%CI=1.01-1.23) after adjustment for potential confounders (Heck *et al.*, 2003).

On the other hand, mothers who spent one night in the hospital were more likely to breastfeed than mothers who spent 2 or 3 nights in the hospital (OR = 1.96, 95%CI=1.86-2.03) (Margolis and Schwartz, 2000). (Carty and Bradley, 1990). This may reflect the fact that mothers with problems or who are at higher risk may be kept in hospital longer, while older and more experienced mothers are discharged earlier.

2.2.6.4. Location of delivery

Studies in developing countries showed an association between place of delivery and infant feeding patterns. A survey conducted in peri-urban Guatemala City, Guatemala, reported that the most important determinant of early initiation of breastfeeding was place of delivery. Children born at home (OR = 4.1, 95%CI: 1.2-13.3) and at government health centres (OR = 4.9, 95%CI: 1.6-15.0) were significantly more likely than children born at private hospitals to be initiated breastfeeding early (Dearden *et al*, 2002a). In Indonesia, women whose delivery attended by a TBA or who delivered at home were more likely to continue breastfeeding than women having a more 'modern' delivery (Iskandar, Costello and Nasution, 1990). In a longitudinal survey of more than 3,000 Filipino mother-infant pairs, delivery in a private hospital had a negative effect on breastfeeding(Stewart *et al.*, 1991).

However, a study in Nigeria showed that home delivery was found to have a statistically significant negative effect on the practice of exclusive breastfeeding (Ogbonna, Okolo and Ezeogu, 2000).

2.2.6.5. Mode of delivery

In the literature, a negative association has been reported between caesarean delivery and initiation and duration of breastfeeding. In Australia, women who had a cesarean section experienced a significant delay in initiating breastfeeding compared with women giving birth vaginally, with or without instrumental assistance (Rowe-Murray and Fisher, 2002). Similarly, in Mexico, cesarean section was a risk factor for not initiating breastfeeding (OR = 0.64, 95%CI = 0.50-0.82) and for breastfeeding for less than one month (OR = 0.58, 95%CI = 0.37-0.91) but was unrelated to breastfeeding duration among women who breast-fed for one month or more (OR = 0.97, 95%CI= 0.86-1.11) (Perez-Escamilla, Maulen-Radovan and Dewey, 1996).

In an Indian study of one hundred mothers undergoing cesarean section, babies separated from the mothers in hospital were less likely (35.5 percent) to be on total breastfeeding as compared to those (68.1 percent) who were not separated from their mothers. This suggests early initiation of breastfeeding is highly correlated with the

establishment of breastfeeding while separation of babies from mothers discourages breastfeeding (Mathur *et al.*, 1993b).

Others have found no association between mode of delivery and breastfeeding. In a study of 121 primiparas to determine the impact of cesarean delivery on time of first breastfeeding, no relationship was found between delivery type and duration of breastfeeding, and pain or fatigue related to breastfeeding. Time of first breastfeeding was not related to breastfeeding duration (Kearney, Cronenwett and Reinhardt, 1990).

In Israel, type of delivery was significantly associated with the onset of breastfeeding, even when controlling for educational level. Women underwent cesarean delivery were less likely to begin breastfeeding than mothers delivered vaginally, although once breastfeeding had begun, type of delivery no longer played any role (Mansbach, Greenbaum and Sulkes, 1991).

It is possible that the type of anesthesia used for cesarean section may influence breastfeeding outcomes. In Australia and many western countries, epidural anesthesia is the norm and the infant can be placed at the breast minutes after delivery. In many developing countries a full general anesthetic is still used so mothers and infants may be separated for some time after delivery.

2.2.7. Cultural beliefs and practices

Influence of cultural beliefs and practices on breastfeeding patterns has been addressed in several studies (Rossiter, 1992, Park and Peterson, 1991, Curley, 2003, Dodgson and Struthers, 2003). Breastfeeding and timing of weaning are socially and bio-culturally patterned and vary across societies. They are determined by the mother's characteristics, her choices, her knowledge and perceptions about child's health or cultural beliefs related to breastfeeding (Bohler and Ingstad, 1996, Moffet, 2001).

There was belief that the breast milk of a pregnant woman could 'rot' and cause disease in the child. In spite of this belief, concurrent breastfeeding and pregnancy

were common, but a pregnant mother whose breastfed child got ill, for instance with diarrhoea, would immediately stop breastfeeding (Bohler and Ingstad, 1996).

In Southwestern Nigeria, exclusive breastfeeding was considered dangerous to the infant. The baby has an obligatory requirement for supplementary water to quench its thirst and promote its normal development, and for herbal teas which serve as food and medicine. Colostrum is discarded because it is dirty, 'like pus', and therefore potentially harmful to the infant, although 24 percent of the participants would give it to their babies. Expressed breastmilk is suspect as it can get contaminated, poisoned or bewitched. Complementary foods are introduced as early as two months because of perceived lactation insufficiency (Davies-Adetugbo, 1997).

2.2.8. Infant's related factors

2.2.8.1. Infant's health

Association between breastfeeding patterns and weight of infants were studied in several studies (Sachdev and Mehrotra, 1995, Ertem *et al.*, 2001, Lande *et al.*, 2003, Hunkeler *et al*, 1994). In Norway, the odds of breastfeeding at six months significantly decreased with decreasing infant birth weight (Lande *et al*, 2003). A study of 3,080 mother-infant pairs from urban and rural communities in the Philippines showed that the low birth weight of infants significantly decreased the likelihood that women would initiate breastfeeding. Low birth weight of infants increased the likelihood of not breastfeeding or of weaning before six months (Adair and Popkin, 1996).

2.2.8.2. Infant's sex

While infant's gender was found not significantly associated with the breastfeeding pattern by some authors (Ertem *et al*, 2001, Li *et al.*, 2000, Chye and Lim, 1998), this did hold in other studies. For instance, Lande et al reported that exclusive breastfeeding at four months was dependent upon infant gender (Lande *et al*, 2003). In Switzerland, initial prevalence of breastfeeding was significantly higher among girls (97.2 percent) than boys (89.4 percent, p<0.01) (Bouvier and Rougemont, 1998). A slightly higher proportion of boys than girls breast fed for duration exceeding 18 months was observed in Tunisia (Obermeyer and Cardenas, 1997). In

the Hindu communities of India, female children had a higher risk of an earlier stop to breastfeeding (Nath and Goswami, 1997).

2.2.9. Sources of support

2.2.9.1. Informal sources of support

Husbands/partners of women have been consistently identified as the primary source of support in the initiation and maintenance of breastfeeding. There is evidence that fathers can influence the choice of feeding method and feeding duration by acting as either key support or deterrent to breastfeeding by the mother (Freed, Fraley and Schanler, 1992, Jordon and Wall, 1993, Giugliani *et al.*, 1994a, Pollock, Bustamante-Forest and Giarratano, 2002).

In the United States, however, few opportunities exist for fathers to prepare themselves to offer the emotional and practical support required by their partners (Freed, Fraley and Schanler, 1992). It has been recommended that fathers should be included in pre- and perinatal breastfeeding education. Fathers should be given a chance to discuss their supportive role for breastfeeding mothers (Scott, Binns and Arnold, 1997)

The influence of other close relatives such as the infant's grandmothers on initiation and duration of breastfeeding have been investigated (Senanayake *et al.*, 1999, Li *et al.*, 1999, Sayers *et al*, 1995). Women who had regularly seen a relative or friend successfully breastfeed and described this experience positively, were more confident about and committed to breastfeeding (Hoddinott and Pill, 1999). In addition, help with household tasks and the attitudes of friends and relatives toward breastfeeding were also related to intended breastfeeding duration (Paine and Dorea, 2001).

In Finland, the more affirmation the mother received from members of her social network the better she coped with breastfeeding (Tarkka, Paunonen and Laippala, 1999). Even in the United States, health professionals' attitudes were less influential on women's infant feeding decision than the attitudes and beliefs of members of their social support network (Humphreys, Thompson and Miner, 1998).

However, attitudes of the mother, her partner (the infant's father) and the infant's grandmother towards breastfeeding did not influence the infant feeding pattern in Bolivia (Ludvigsson, 2003a).

2.2.9.2 Formal sources of support

The health care system has an important role to play in the promotion and support of breastfeeding. Health care professionals may be a negative source of support if they provide women with inconsistent, inaccurate or inadequate breastfeeding information (Dennis, 2002).

In populations less likely to breastfeed, encouragement by nurses and physicians can significantly increase breastfeeding initiation. Women who were encouraged by their physicians and nurses to breastfeed were four times more likely to initiate breastfeeding than women who did not receive such encouragement (Lu *et al.*, 2001). Repeated organized breastfeeding counselling could significantly improve the prevalence of exclusive breastfeeding to 54 percent which is much above the existing national prevalence (12.7 percent) in Bangladesh (Haque *et al.*, 2002). On the other hand, health professional practices discouraging breastfeeding were observed more frequently at the urban hospitals of Jamaica than at the rural hospitals, whereas practices promoting breastfeeding were more common at the rural hospitals and the mothers followed the suggested recommendations (Cunningham and Segree, 1990).

However, the influence of health professionals on breastfeeding patterns appeared to be weak. Breastfeeding orientation provided by doctors, nurses, and nutritionists was not associated with the maternal decision to breastfeed (Giugliani *et al.*, 1994b) with a gap between the promotion and support processes for breastfeeding (Coreil *et al.*, 1995).

2.2.10 Marketing of infant formula

The formula milk industry is often blamed for low rates of breastfeeding. Commercial advertisements often portray formula milk as convenient for the mother. Aggressive marketing activities by multinational companies have affected infant feeding choices. A study found that 97 out of 370 mothers in Bangkok reported receiving free sample of breast milk substitutes, infant formula, bottles, or teats

compared with only one out of 385 in Dhaka. In Bangkok, health workers reported that 20 out of 40 health facilities had also received free samples. Most free samples were distributed by health facilities. In Warsaw, 56 percent of facilities surveyed had information available for health workers provided by manufacturers or distributors of breast milk substitutes. It also noted that 18 percent of health workers in Warsaw had received free gifts from manufacturers, violating the international code of marketing of breast milk substitutes (Taylor, 1998).

A recent critical review reported that free samples of artificial milk, distributed at health centres and hospitals, can contribute to mothers failing to establish breastfeeding (Donnelly *et al.*, 2000). Health professionals involved with prenatal care and delivery are often contacted by food manufacturers and provided with educational and advertising materials and free samples of their products for distribution to patients. Health professional in turn provide infant-feeding information and advice to their patients, and the content and strength of their recommendations may be affected by their contacts with infant food industries (Adair, Popkin and Guilkey, 1993, Stewart *et al*, 1991).

The media is pervasive and powerful and has the potential to affect social norms about breastfeeding and decision making. Television shows and commercials viewed by millions of women every day are particularly influential towards perceptions and beliefs (Bentley, Dee and Jensen, 2003). The main role of media in the breastfeeding discourse has been to provide information on which formula products are superior and the best value for money (Henderson, 1999).

To encourage breastfeeding and protect mothers from pressure to use substitutes for breast milk, the International Code of Marketing of Breast-milk Substitutes was adopted in 1981 by the World Health Organization (WHO, 1981). Vietnam adopted substantially all of the code's provisions as legal requirements since 1994.

In summary, although breastfeeding has demonstrated benefits not only to infant and mother but also to family and society, its current trend is discouraging. There are several determinants of breastfeeding practice, namely (i) personal characteristics, (ii) attitudinal and intra-personal characteristics, (iii) hospital policies and intra-

partum experiences, (iv) cultural beliefs and practice, (v) infant related factors, (vi) sources of supports, and (vii) influence of marketing of infant's formula industries. Studies on these factors in the context of developing countries such as Vietnam is important in order to improve the health status of children in general and the breastfeeding prevalence in particular.

2.3. Factors influencing postpartum contraception

2.3.1. Concept of postpartum contraception

Postpartum is a critical period for mothers in terms of physical and psychological health. There are two approaches to deal with postpartum contraception in the literature. The first approach has promoted a reliance on natural lactational protection against pregnancy for as long as possible, and the introduction of proper contraception when the pregnancy risk becomes substantial (Adamchak and Mbizvo, 1990, Kennedy, Rivera and McNeilly, 1989). As breastfeeding is associated with the suppression of ovarian activity, and thus with a variable period of amenorrhoea and infertility (McNeilly, 1993), women who breastfeed their infants frequently and who delay the introduction of supplementary feedings tend to remain amenohrreic for a longer period (Howie *et al.*, 1981, Lewis *et al.*, 1991). Full or nearly full breastfeeding during lactational amenorrhoea can offer 98 percent protection against pregnancy within the first six months after childbirth (Kennedy, Rivera and McNeilly, 1989, Vekemans, 1997). The degree of protection has been shown to be valid in several clinical studies (Perez, Labbok and Queenan, 1992, Kazi *et al.*, 1995, WHO Task Force on Methods for the Natural Regulation of Fertility, 1999)

In the second approach, an immediate postpartum strategy by adopting contraceptive methods within 40-45 days after delivery has been suggested. The rationale is that delaying the initiation of contraception increases the risk of unwanted pregnancy, because it is impossible to accurately predict when a woman will be fecund (Trussell and Santow, 1991). Double coverage, that is, the simultaneous use of contraception while being amenorrheic and breastfeeding varies from countries to countries. A double rate of 80 percent during the first three months has been reported in Indonesia and Sri Lanka. In Thailand it is 60 percent but declines to less than 40 percent at 4-7

months postpartum (Hight-Laukaran *et al.*, 1996). The double rates within the first six months in some developing countries are given in Table 2.3.1.

Table 2.3.1: Percentage overlap between contraceptive use and lactational amenorrhoea among women 0-6 months postpartum

Country	% Overlap
Botswana	48.1
Kenya	59.7
Zimbabwe	66.8
Egypt	30.0
Morocco	17.3
Tunisia	9.3
Indonesia	53.2
Sri Lanka	50.4
Thailand	57.6
Bolivia	41.2
Brazil	18.6
Colombia	32.7
Dominican Republic	25.8
Ecuador	60.9
Guatemala	46.0
Mexico	17.1
Peru	19.2
Trinidad	17.5

Sources: Hight-Laukaran *et al* (1996)
Based on person month estimation

2.3.2 Prevalence of postpartum contraception

While the prevalence of exclusive breastfeeding has been discouraging, failure to use postpartum contraception may also lead to early-repeated pregnancies, with attendant risks to maternal health. In the United States, the repeat pregnancy rate was 14 percent at one year and 35 percent at two years (Stevens-Simon and Kulick, 2001).

Unintended pregnancies within a short interval often end in abortion. Half of all pregnancies in the United States were unintended and 46 percent of those pregnancies resulted in live births and 54 percent in induced abortion (Henshaw, 1998). In Finland, pregnancies at eight months postpartum were more likely to end in abortion. Moreover, the shorter the interval to the next pregnancy, the pregnancy was more likely to end in abortion (Vikat, Kosunen and Rimpela, 2002). In Vietnam, although the contraception prevalence rate is relatively high with 79 percent of married couples use any contraceptive method and 57 percent use modern methods,

two third of pregnancy terminations occur among women who use contraceptives at the time of becoming pregnant. Indeed, one quarter of the births are unplanned (Committee for Population Family and Children, 2003).

2.3.3. Personal characteristics

The influences of demographic variables such as age, parity, ethnicity, and education level of mother were reported in some studies (Tehrani, Farahani and Hashemi, 2001, Romeo-Gutierrez *et al.*, 2003, Rojnik, Kosmelj and Andolsek-Jeras, 1995). In Iran, an estimated odds ratio of not using contraceptive methods was 1.3 and 1.9 among women aged ≤ 20 and >35 respectively in comparison with women aged 21-35 (Tehrani, Farahani and Hashemi, 2001).

A case control study in Slovenia found that parity and education were risk factors for early postpartum conception terminated by induced abortion. Most families have two children and women are more inclined to use abortion as a backup procedure for contraceptive failure when they have already fulfilled their desired family size. Parity may affect the decision when to initiate contraception postpartum and whether an early postpartum pregnancy will be carried to term or not (Rojnik, Kosmelj and Andolsek-Jeras, 1995). In a survey of 462 American women aged 18 years or younger at delivery and 6 months postpartum, school enrolment and not having failed a grade in school were associated with contraceptive use (Berenson and Wiemann, 1997).

However, in Mexico, women's level of education significantly affected contraceptive acceptance but not other variables such as marital status, religion, husband's occupation, husband's education, monthly family income, and women's occupation (Romeo-Gutierrez *et al*, 2003).

2.3.4. Attitudinal and intra-personal characteristics

It has been reported that the reasons given for not using contraceptives included health problems, lack of knowledge and lack of access to contraception (Gadow, Jennings and Camelo, 1999).

Previous experiences with maternal health services are also influential factors of contraception. Attendance at postpartum visits and having had a prior abortion could influence contraceptive decision (Berenson and Wiemann, 1997), while previous familiarities with contraceptive methods could affect contraceptive use (Tehrani, Farahani and Hashemi, 2001). A study in Germany found that perceived accuracy of observation to identify the fertile time and acceptance of own body were independently associated with both interest in and choice to use natural family planning (Mikolajczyk, Stanford and Rauchfuss, 2003). Belief that pregnancy is likely without birth control, and the adolescent's desire to wait at least two years before having another child, could reliably predict the use of contraception at the last intercourse (Berenson and Wiemann, 1997).

In Bangladesh, women are primarily concerned with their own and their newborn child's health and well-being in the period following childbirth. In addition, women are aware of a diminished risk of pregnancy during the period of postpartum amenorrhoea. These perceptions, together with the belief that modern methods of contraception are 'strong' and potentially damaging to health, mean that the majority of women are reluctant to adopt family planning methods soon after birth, despite a desire to avoid closely spaced pregnancies (Salway and Nurani, 1998)

In Mexico, reasons for accepting contraceptives included the definitive desire for no more children (17 percent) and satisfaction with previous contraceptive methods (21.5 percent) (Romeo-Gutierrez *et al*, 2003). Mother's desire to wait at least two years before having another child was also an important factor (Berenson and Wiemann, 1997).

A study in the United States found 80 percent of women surveyed were using contraception prior to pregnancy but nearly 20 percent were not satisfied with the method used. Dissatisfaction with their method was more likely among women whose pregnancy was unplanned. Over 40 percent of peripartum women indicated a desire to change their contraceptive after delivery (Cwiak, Gellasch and Zieman, 2004).

2.3.5. Health status of mothers

In Mexico, caesarean section was predictive for contraceptive acceptance (Romeo-Gutierrez *et al*, 2003). Moreover, time since menses resumption and number of menstrual bleedings were important factors for postpartum contraceptive use (Rojnik, Kosmelj and Andolsek-Jeras, 1995).

Among adolescent mothers commencing birth control six weeks after delivery, 58 percent of oral contraceptive users and 93 percent of depot medroxyprogesterone acetate users cited side effects as the reason for contraceptive discontinuation (O'Dell *et al.*, 1998). Side effects were also evident for the inconsistent use of contraception among adolescents in another study conducted in the United States (Templeman *et al.*, 2000).

2.3.6. Influence of providers

The prenatal and postpartum periods afford good opportunities to influence contraceptive behaviour since women are in close contact with the health care system during pregnancy and the first months of the baby's life (Vikat, Kosunen and Rimpela, 2002). Several studies have shown that women want to discuss contraception with health providers antenatally and also after hospital discharge (Ozvaris, Akin and Yildiran, 1997).

IIn Shanghai, women were found to use less reliable methods: at six months postpartum, over 40 percent were using condoms and 20 percent were using 'other methods' which included natural family planning. Either the need to use a reliable method of contraception was not stressed sufficiently by the healthcare providers or alternatively, the advice given was ignored by the client (Smith *et al.*, 2002)

There is evidence that women are more receptive to advice given antenatally (Walton, Gregory and Cosbie-Ross, 1987). A study conducted in Egypt on the impact of antenatal counselling on couple's knowledge and practice of contraception, follow-up immediately after delivery and three months later, suggested that counselling sessions did improve the couple's knowledge and practice (Soliman, 1999). However, despite women found the opportunity to discuss contraception

antenatally useful, it did not make any difference to the patterns of contraceptive use postpartum (Smith *et al*, 2002).

In Scotland, obstetricians appeared to have little interest in the subject and only 50 percent of mothers left the hospital with a supplied contraceptive. Up to 84 percent of the women discussed the issue with a midwife on the postnatal ward but discussion was often felt to be brief, limited and frequently held at the time of leaving the hospital (Smith *et al*, 2002). Postnatal ward is an inappropriate setting for contraceptive counseling because mothers are discharged home after only three or four days and during their stay are anxious to establish infant feeding and to learn to care for the new baby. Nevertheless, contraception is probably the last thing on a new mother's mind during the first few days after delivery, yet leaving the discussion until later in the postpartum period may mean missing the opportunity altogether (Smith *et al*, 2002).

Midwives are good at these aspects of postnatal care but receive only limited training in family planning. As a consequence, when giving advice to mothers on contraception, they universally denied the contraceptive effects of breastfeeding (Glasier, Logan and McGlew, 1996). According to WHO, in many countries, counselling on contraception also ignores the lactational amenorrhoea method (WHO, 1998)

Counseling plays a crucial role in improving postpartum contraception practice. However, for women in developing countries, postpartum care frequently does not include counselling on family planning. Consequently, the risk of poorly timed or unwanted pregnancies will increase if women are unable to obtain effective contraception (Rivera and Solis, 1997). Even in a developed countries such as Finland, if health care professionals assume that women in a certain age group know how to take care of contraception themselves, such women may receive less counseling about family planning (Vikat, Kosunen and Rimpela, 2002).

Postpartum reproductive care should pay attention not only to family planning but also to other aspects of maternal and child health through immunizations and other services. Combined services offer the opportunity for cost reduction and improved

quality of care, since the reproductive health needs of postpartum women can be addressed jointly with the needs of their infants (Hight-Laukaran *et al*, 1996). Similarly, Winikoff & Mensch (1991) suggested giving combined advice on breastfeeding and contraception (Winikoff and Mensch, 1991).

2.3.7. Influence of the husband/partner and close relatives

Husband/partner's perception and attitude towards contraception have an important role in determining the contraceptive behaviour of the women during the postpartum period. A study in Mexico (Romeo-Gutierrez *et al*, 2003) found that the reasons for rejecting contraceptives were related directly to the opinion of the husband.

In rural Turkey, 26.8 percent of men did not want their wives to use an intrauterine device and 31.7 percent did not agree with women using contraceptive pills. Men had very poor information about family planning; only 17.5 percent of men in the study group had contacted a doctor or health facilities to obtain information (Mistik *et al.*, 2003). In Iran, the husband's level of education could influence contraceptive use (Tehrani, Farahani and Hashemi, 2001). Sexuality and contraception after delivery should be discussed when the mother or both parents visit the maternity clinics (Vikat, Kosunen and Rimpela, 2002). In fact, involving husband in family planning counselling sessions had led to joint decisions being made and encouraged women's use of contraception (Soliman, 1999).

Finally, a study in the United States found that discussions with parents and friends have a positive effect on choosing Norplant for non-Hispanic white teenagers. Peers were found influential in spreading information about Norplant than physicians (Mears *et al.*, 1997).

In summary, delaying the initiation of contraception whilst not practicing exclusive breastfeeding during the postpartum period can put women at risk of unwanted pregnancies. Factors affecting postpartum contraception include (i) personal characteristics, (ii) attitudinal and intra-personal characteristics, (iii) mother's health status, (iv) providers, (v) husband/partner and close relatives. For a developing country like Vietnam where the rate of abortion is highly alarming, studies on

determinants of postpartum contraception could help the prevention of unwanted pregnancies during the postpartum period.

Chapter 3: Methodology

This chapter summaries the research methods used in the seven original articles, including study location, designs and data collection procedures, research instruments, data analysis, and ethical considerations. Details of the methodology for each article are given in Chapter Four.

3.1. Study location

The study was conducted in Quang Xuong district, Thanh Hoa Province, which is located 150 km south of Hanoi. Quang Xuong district is divided into 41 communes, of which 9 are coastal and 32 lowland, with a total population of 240,000. The district has only one ethnic group, Kinh. Most people identified themselves as Buddhist (95%), with the remainder being Catholic (3%) or other (2%). The population growth rate for Quang Xuong was 1.6% in 1999. The health care system of the district is organized according to the national model with one 150-bed district hospital and a commune health centre for each commune. Although most health care services are provided by the government health facilities, there are a number of private practitioners (doctors, assistant doctors, traditional healers and private pharmacies). The district is representative of the rural low land areas of North-Central Vietnam according to demographic and health indicators (Quang Xuong District Health Service, 2000). The map of the study location is given in Figure 3.1.1

3.2. Study designs and data collection procedures

The samples for the study were selected in the following ways. Papers I-III were based on cross-sectional surveys undertaken in the forty one communes of Quang Xuong district. The communes were stratified into five areas with respect to socio-economic and geographical conditions. A list of women who were either pregnant or had given birth within the past three months was generated from routine reports for the National Expanded Programme of Immunization, and from antenatal care provided by commune health centres and Quang Xuong District Health Services. The list was considered to be complete by the local health workers. It contained 1,218 pregnant women and 1,059 women who had recently given birth. A sample of 210
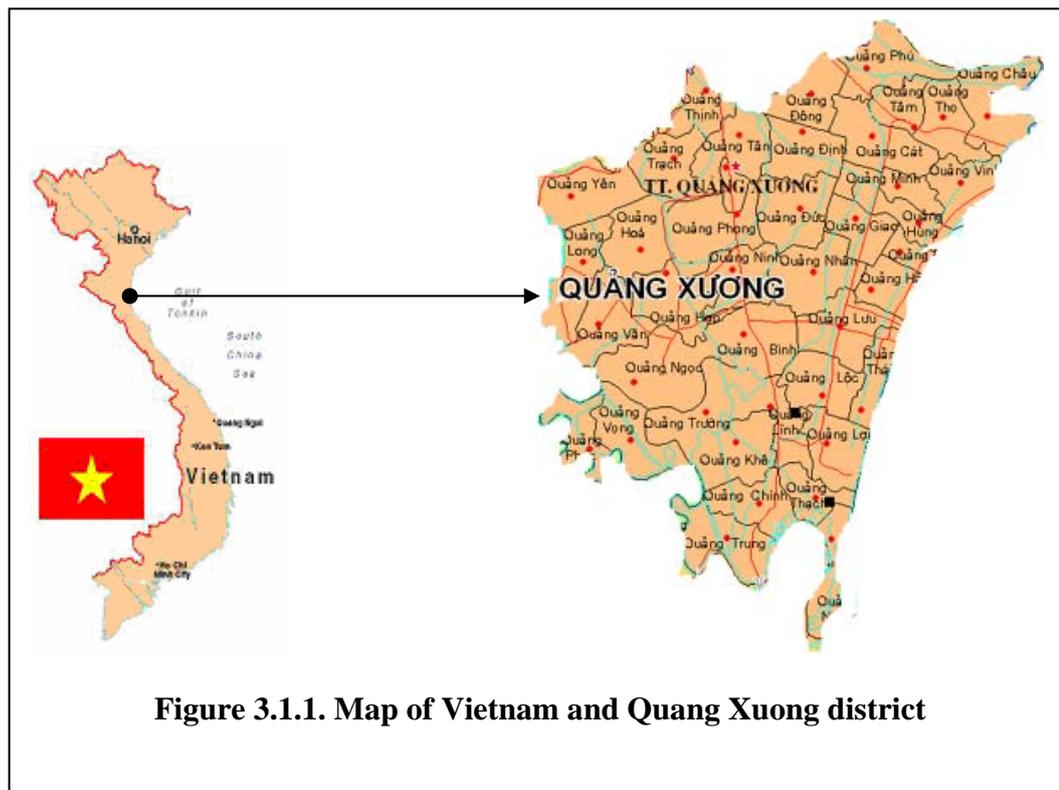
Figure 3.1.1. Map of Vietnam and Quang Xuong district

pregnant women (prenatal group) and another sample of 210 women who had given birth within the past three months (postpartum group), were randomly selected from the list. The sample size of 210 subjects per group was determined to give a statistical power of 80 percent at a significance level of 0.05 allowing for a five percent non-response rate. A total of 200 women (102 of them delivered at a health care setting and 98 delivered at home) in the postpartum group, and 204 pregnant women in the prenatal group, gave their written informed consent to participate (the response rate being 96 percent). Eight subjects in the prenatal group were later excluded due to incomplete information recorded in their questionnaires. In Paper I, the partners of the pregnant women were selected as the non-user group. The final sample thus consisted of 200 postpartum, 196 pregnant women and 196 men. The sampling procedures and data collection process are summarized in Table 3.2.1.

To minimise possible bias in the information collected, two research assistants from institutions in Hanoi visited the subjects either at home or in the rice field. Prior to interviewing the subjects, the assistants confirmed their pregnancy status (for the prenatal group) or birth location (for the postpartum group). If a subject had been

misclassified, a replacement was then randomly chosen from the list. In Paper I, the two assistants separately interviewed each pregnant woman and her partner at the same time in different places. If they could not interview a woman and her partner at the same time, a new couple was then randomly chosen from the list.

Table 3.2.1: Summary of study designs and data collection methods

Paper	Contents	Study population and design	Methods of data collection	Data collection period
I	Preferences and willingness-to-pay of maternal services	Cross-sectional 200 postpartum women 196 pregnant women 196 men	Semi-structured interview	Jun-Aug 2000
II	Perceived quality of maternal services	Cross-sectional 200 postpartum women 196 pregnant women	Structured interview	Jun-Aug 2000
III	Factors influencing utilization of maternal services	Cross-sectional 200 postpartum women	Semi-structured interview	Jun-Aug 2000
		Purposive sample 16 focus group discussions	Semi-structured interview	Aug-Sept 2000
		16 in-depth interviews	Unstructured interview	Aug-Sept 2000
IV	Breastfeeding initiation and exclusive breastfeeding within seven days postpartum	Cross-sectional 463 postpartum women	Semi-structured interview	Aug-Oct 2002
V	Introduction of complementary food within six months postpartum	Longitudinal Baseline: 463 women Week 16: 460 women Week 24: 459 women	Semi-structured interview	Aug 2002-Apr 2003
VI	Factors influencing breastfeeding patterns within six months postpartum	Longitudinal Baseline: 463 women Week 16: 460 women Week 24: 459 women	Semi-structured interview	Aug 2002-Apr 2003
		Purposive sample 16 focus group discussions	Semi-structured interview	May-June 2004
VII	Factors influencing contraception within six months postpartum	Longitudinal Baseline: 463 women Week 16: 460 women Week 24: 459 women	Semi-structured interview	Aug 2002-Apr 2003

In Paper III, after the completion of the cross-sectional survey, a qualitative survey including focus group discussions and in-depth-interviews were undertaken so as to obtain complementary information not available from the structured questionnaire. Sixteen focus group discussions involved women who gave birth within the last 3

months (six groups), mothers/mothers-in-law (four groups), and husbands/partners (six groups). The size of the groups ranged between 6 and 8 people. Women who already participated in the quantitative survey were not selected for focus group discussion. Sixteen in-depth-interviews were also conducted on public and private providers, traditional birth attendants, and women union activists. The focus group discussions and in-depth-interviews were conducted in the Vietnamese language.

Papers IV-VII report findings from a longitudinal study. About 3,400 babies were born in the district in 2002. A sample of 463 rural women who gave birth during August-October 2002 in Quang Xuong district was recruited, accounting for 13.4% of babies born in 2002. Research assistants were given information about deliveries by district and commune health authorities. Mothers were consecutively selected until the required sample size for sufficient statistical power (80%) was attained. For those who delivered in the District Hospital (DH), research assistants interviewed them during their post-partum period in the hospital. For those who delivered either at a CHC or at home, interviews were conducted at CHCs or at the home of subjects. Subjects were then followed up at home at weeks 16 and 24. Whilst Paper IV used data from the baseline survey, Papers V-VII made use of both baseline and follow-up data.

In Paper VI, after the completion of the longitudinal survey, a qualitative study including 16 focus group discussions was undertaken during May-June 2004. These included women within the first six months postpartum (six groups), men whose partners were within the first six months postpartum (six groups), and commune health workers (four groups). The size of the groups ranged between 6 and 8 people.

3.3. Research instruments

3.3.1. Quantitative questionnaires

For the studies reported in Papers I-III, a questionnaire was developed to solicit demographic and socio-economic information, already paid costs of and access to services. Willingness-to-pay was measured using the payment card technique outlined in recent studies (Donaldson, Hundley and Mapp, 1998, Donaldson, 2001) (Paper I). Client-perceived quality of delivery services at CHC was measured using a

20-item scale adapted from Haddad, Fournier and Potvin (1998) (Paper II). Information on mother's knowledge, attitude and practice of infant feeding were adapted from Scott et al. (2001), and Scott (1997) (Papers IV-VI). Mother's knowledge, attitude and practice of sexuality and contraception during postpartum period were also included in the questionnaire (Paper VII). Details of each questionnaire can be found in Appendix 1.

3.3.2. Qualitative instruments

The Attitudes-Social influence-Self efficacy (ASE) model (Amooti-Kaguna and Nuwaha, 2000) was used as the underlying framework to qualitatively explore factors influencing the utilization of delivery services in Paper III. The breastfeeding decision-making model, outlined by Marten and Young (1997), was used to examine factors influencing the infant feeding patterns in Paper VI.

Both quantitative and qualitative instruments were pre-tested for cultural sensitivity prior to actual data collection.

3.4. Statistical analysis

Quantitative data were analysed using the Statistical Package for Social Sciences version 11.0 (SPSS Inc., 2001). Logarithmic transformation was applied to cost of service, household expenditure and income to satisfy the normality assumption for statistical analyses. Univariate and multivariate analysis were conducted to examine the relationships between dependant and independent variables. A summary of the statistical analyses was provided in Table 3.4.1. For the qualitative surveys, the interviews and focus group discussions were tape-recorded and transcribed verbatim in Vietnamese. Data were coded and then analysed in Vietnamese according to the themes outlined in the selected models so as to complement the quantitative results. Finally, quotes were selected to represent the mentioned themes and translated into English. The package Nonnumerical Unstructured Data-Indexing Searching and Theorising (NUD*IST) version 4.0 (Qualitative Solutions & Research Pty Ltd, 1997) was used for text analysis and management of the qualitative data.

Table 3.4.1: Summary of statistical analyses

	Purpose of analyses	Statistical methods used
Paper I	Compare means and explore the association between variables	T-test, chi-square test, and analysis-of-variance
	Examine inter-rater reliability	Kappa statistics
Paper II	Examine structure of the 20-item scale	Factor analysis
	Examine internal consistency	Cronbach's alpha coefficient
	Examine inter-rater reliability	Kappa statistics
	Examine association between perceived quality score and independent variables	Logistics regression analysis
Paper III	Compare setting- and home-based groups	T-test and chi-square test
	Examine relationship between delivery options and independent variables	Logistics regression analysis
Paper IV	Compare exclusive breastfeeding and non-exclusive breastfeeding groups	Descriptive and univariate statistics
	Explore factors influencing the decision to exclusively breastfeed within 1 week postpartum	Logistics regression analysis
Paper V	Compare feeding patterns	Descriptive statistics and univariate statistics
	Explore factors affecting the decision on feeding solid food at week 16 and week 24 postpartum.	Logistic regression analysis
Paper VI	Examine feeding patterns at different intervals	Descriptive statistics and univariate tests
	Explore factors that affected breastfeeding at week 16 and week 24 postpartum	Logistic regression analysis
Paper VII	Compare contraception patterns	Descriptive statistics and univariate tests
	Assess factors affecting the decision on contraceptive use during week 16 and week 24 postpartum	Logistic regression analysis

3.5. Ethical considerations

3.5.1. Consent

Subjects were informed about the purpose of the study and asked to give their formal consent to participation. Participation was entirely voluntary and they could refuse to participate or withdraw at any time without any negative consequences. The protocol followed the ethical principles of the Helsinki Declaration (World Medical Association, 1996) and the National Health and Medical Research Council of Australia (NHMRC, 1999), and was approved by the local health authorities and the Human Research Ethics Committee of Curtin University (approval number HR 160/2002).

3.5.2. Confidentiality

All subjects were identified via ID numbers and not by name. Under no circumstances, the identity of the subjects were revealed beyond the research team

comprising the principal investigator and the two research assistants. All the documents in the research such as questionnaires and transcripts are kept confidential and locked in a secure filing cabinet. Only the researchers have access to these documents. Similarly, data stored in a personal computer are protected via passwords known by the researchers only. Upon completion of the project, all these documents will be kept for 7 years under the regulation in a safe place. After that time all paper records will be destroyed.

Chapter 4: Results and Discussions

The findings and discussions of this thesis are presented as seven original papers that were published or accepted for publication in international peer-reviewed journals as follows:

I. Duong DV, Binns CW, Lee AH (2005) Measuring preferences for delivery services in rural Vietnam. *Birth: Issues in Perinatal Care* (accepted for publication).

II. Duong DV, Binns CW, Lee AH, Hipgrave DB (2004) Measuring client-perceived quality of maternity services in rural Vietnam. *International Journal for Quality in Health Care.* 16(6):447-452

III. Duong DV, Binns CW, Lee AH (2004) Utilization of delivery services at the primary health care level in rural Vietnam. *Social Science and Medicine* 59:2585-2595.

IV. Duong DV, Binns CW, Lee AH (2004) Breastfeeding initiation and exclusive breastfeeding in rural Vietnam. *Public Health Nutrition.* 7(6): 795-799.

V. Duong DV, Lee AH, Binns CW (2005) Introduction of complementary food to infants within the first six months postpartum in rural Vietnam. *Acta Paediatrica.* (accepted for publication)

VI. Duong DV, Lee AH, Binns CW (2005) Determinants of breastfeeding within the first six months postpartum in rural Vietnam. *Journal Paediatrics and Child Health* (accepted for publication).

VII. Duong DV, Lee AH, Binns CW (2005) Contraception within six-month postpartum in rural Vietnam: implications on family planning and maternity services. *European Journal of Contraception and Reproductive Health Care* (accepted for publication).

4.1 Measuring preferences for delivery services in rural Vietnam

(Accepted for publication in Birth: Issues in Perinatal Care)

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Abstract

Background: The relatively low utilization of maternity services at the primary health care level in Vietnam has highlighted the need to undertake economic evaluations of the current maternal health delivery network. This study measures willingness-to-pay for obstetric delivery preferences in rural Vietnam.

Methods: An interviewer-administered survey was conducted among 200 postpartum and 196 pregnant women, and 196 men in Quang Xuong district, Thanh Hoa province of Vietnam using the payment card technique.

Results: A Kappa score of 0.98 showed very good agreement between the two interviewers administering the survey. An association was found between willingness-to-pay and satisfaction with the quality of maternity services. There were no significant differences in willingness-to-pay values between prenatal and postpartum groups, and between male and female subjects.

Conclusions: The study demonstrates that the willingness-to-pay instrument is feasible and is relatively reliable to measure the benefit of different alternatives of delivery services in rural Vietnam. For wider application of the instrument, its validity should be investigated further. Meanwhile, health care managers and decision makers should be encouraged to apply the instrument in the evaluation of maternal health programmes.

Key words: maternity services, reliability, Vietnam, willingness-to-pay.

4.1.1 Introduction

Vietnam has a relatively well-structured state health care system that is organized as a four-tiered pyramid. At the top of the pyramid is the Ministry of Health, followed by Provincial, District and Commune health authorities. The commune health centre, at the village level, is responsible for providing primary health care, including maternity services. A district hospital serves as a main referral point for all commune health centres within the district. Health sector reform in the early 1990's, including the introduction of user fees for health services and the legalization of private practice, had profound effects on the health sector and the health seeking behaviour of the community (1). In the area of maternity services, the reform offered four main obstetric delivery alternatives for rural women, namely, commune health centre, district hospital, home-based delivery attended by a private provider, and home-based delivery attended by a traditional birth attendant.

Despite recent improvements in access to primary health care, current data showed that the utilization of delivery services at peripheral settings in rural areas is low compared to the national targets. A study conducted by United Nations Population Fund in 12 provinces of Vietnam indicated that although commune health centres were well staffed, the number of clients at these settings remained low (2). The National Committee for Population and Family Planning reported that trained health workers attended about 72 percent of deliveries, but in the coastal and highland areas of Vietnam, the attendance dropped to 60 percent of deliveries (3).

The relatively low utilization of maternity services at the primary health care level in Vietnam has highlighted the need to undertake economic evaluations of the current maternal health delivery network. There has been an increasing interest in using willingness-to-pay when undertaking economic evaluations of health care (4). Willingness-to-pay refers to a method of valuing the benefits of health services with surveys using hypothetical scenarios (5, 6). It is one way of simulating a 'missing market' (4). Typically, when using willingness-to-pay, the benefits of health care services are estimated in monetary terms. Willingness-to-pay attempts to determine how much individuals are prepared to pay to reduce their risk of mortality and morbidity. In this context, pay is a measure of what a client is willing to forego rather than the actual amount of money. The more one is willing to forego for a service, the

more he/she values the quality of the service (7). Therefore, the maximum amount of willingness-to-pay could be used as an indicator of the utility or satisfaction derived by individuals from the health services (8).

The advantages and disadvantages of the willingness-to-pay approach were addressed in a recent study (9). Under the willingness-to-pay approach, respondents are allowed to take into account other factors such as the value they attach to non-health outcome or to the process of care. However, people are often unwilling to place a value on health. In addition, respondents may give artificially high or low answers if they have an interest in prioritizing one area of health care over another.

To the best of our knowledge, very few willingness-to-pay studies in the health care context have been conducted in developing countries, and the few that have been reported are mainly from African nations (10-12). The number of willingness-to-pay studies in the area of reproductive health in general, and on maternity services in particular, is still very modest. Donaldson et al assessed the feasibility of willingness-to-pay as a measure of the benefits of care of a midwife managed delivery unit versus care in a consultant-led labour ward (7). Ryan applied the method to evaluate two alternatives of prenatal care, namely, general practitioners/midwife routine led care versus obstetrician led care (8). Gibb used willingness-to-pay to assess strength of preference for medical abortion versus surgical vacuum aspiration (13). Likewise, Taylor and Armour adopted the approach to assess the acceptability to consumers of two methods of induction of labour (14). The objective of this study is to investigate willingness-to-pay for obstetric delivery alternatives in the rural community in Vietnam.

4.1.2 Methods

4.1.2.1 Subjects and procedures

The study was conducted in Quang Xuong District, Thanh Hoa Province, 150 km south of Hanoi, a district consisting of 41 communes (9 coastal and 32 lowland) with a total population of 240,000. Demographic and health indicators suggested that Quang Xuong District was representative of the North Central region of Vietnam (15).

The 41 communes of the district were stratified into five areas according to socio-economic and geographical conditions. A list of women who were either pregnant or had given birth within the past three months was generated from routine reports for the National Expanded Programme of Immunization, and from prenatal care provided by commune health centres and Quang Xuong District Health Services. The list was considered to be complete by the local health workers. It contained 1,218 pregnant women and 1,059 women who had recently given birth. A sample of 210 pregnant women (prenatal group) and another sample of 210 women who had given birth within the past three months (postpartum group), were randomly selected from the list. The sample size of 210 subjects per group was determined to give a statistical power of 80 percent at a significance level of 0.05 allowing for a five percent non-response rate. A total of 200 women (102 of them delivered at a health care setting and 98 delivered at home) in the postpartum group, and 204 pregnant women in the prenatal group, gave their written informed consent to participate (the response rate being 96 percent). Eight subjects in the prenatal group were later excluded due to incomplete information recorded in their questionnaires. The partners of the pregnant women were selected as the non-user group. The final sample thus consisted of 396 women and 196 men.

To minimise possible bias in the information collected, two research assistants from institutions in Hanoi visited the subjects either at home or in the rice field. Prior to interviewing the subjects, the assistants confirmed their pregnancy status (for the prenatal group) or birth location (for the postpartum group). If a subject had been misclassified, a replacement was then randomly chosen from the list. The two assistants separately interviewed each pregnant woman and her partner at the same time in different places. If they could not interview a woman and her partner at the same time, a new couple was then randomly chosen from the list.

To assess agreement between interviewers or inter-rater reliability, i.e. whether the research assistants can obtain similar ratings for a particular variable on the same subject, participants in the postpartum group were interviewed twice by the two research assistants within one week. The research protocol followed the ethical principles of the Helsinki Declaration (16) and the National Health and Medical Research Council of Australia (17), and was approved by the local health authorities.

4.1.2.2 Questionnaire

The willingness-to-pay questionnaire was developed in conjunction with the local public health experts. Demographic and socio-economic variables including age, education, occupation and family income were collected. For women in the postpartum group, actual direct and indirect costs incurred at delivery were collected based on their recall. Satisfaction with the provided delivery services was measured using a three-point rating scale (satisfied, neutral opinion, and dissatisfied). Willingness-to-pay was measured using the payment card technique (6, 7). Four scenarios for delivery were described, namely, district hospital based, community health centre based, home based with attendance of a health worker, and home based with assistance from a traditional birth attendant. Respondents indicated their preferred option for giving birth. They were then given a payment card ranging from VND10,000 to VND2,000,000. These values were determined after six focus group discussions with clients at the district hospital and two commune health centres on the cost of delivery services. Respondents were asked the maximum amount they would be willing to pay for the chosen option. This procedure was pre-tested on 14 female clients at Quang Xuong District Health Services for cultural sensitivity prior to actual data collection. The willingness-to-pay questionnaire is available from the authors upon request.

4.1.2.3 Data analysis

T-test, chi-square test, and analysis-of-variance were used to explore the association between variables using the SPSS package (18). Inter-rater reliability was assessed using the Kappa statistic. For statistical analysis, logarithmic transformation was applied to the willingness-to-pay variable to satisfy the normality assumption, as the observed data were positively skewed. The log-transformed values of the variable were converted back to their actual monetary values for interpreting the differences between subgroups.

4.1.3 Results

The demographic details of the sample are presented in Table 4.1.1. Eighty percent of respondents identified themselves as farmers. The proportion who had never

attended school or did not complete primary school accounted for less than ten percent of the sample.

4.1.3.1 Inter-rater reliability

To examine the reliability of the instrument, both delivery preference and willingness-to-pay from 199 cases in the postpartum group were analysed, after removing one subject because of missing data. Strong agreement in delivery preference was evident between the two interviewers, with perfect agreement in 197 cases and a high Kappa score of 0.98 (P-value<0.001). We found that 68.3 percent of respondents preferred commune health centre based, 15.6 percent district hospital based, 10.1 percent home based with assistance of a health worker, and only 6 percent preferred the home based delivery with a traditional birth attendant. Of these 197 cases, 143 of them (72.6%) had exactly the same willingness-to-pay value between the two interviewers. Results from paired t-tests also indicated no significant difference in the log-transformed willingness-to-pay means between the two interviewers for all subgroups of preference.

4.1.3.2 Willingness-to-pay values by different delivery preferences

We analyzed willingness-to-pay values for each hypothetical delivery preference stratified by the study groups and key demographic variables, namely age, education, occupation and income. Table 4.1.2 presents willingness-to-pay values by income and study groups. As can be seen from the table, among men who preferred their wives to deliver at the district hospital, those with monthly income exceeding VND500,000 were willing to pay VND198,789 on average, but those with income less than VND500,000 could only afford to pay VND80,822, the means in the log-transformed scale being significantly different (P-value<0.05). Significant difference was also observed in the prenatal group for age. Older women (> 25 years) who preferred to deliver at the district hospital were willing to pay less than younger women (≤ 25 years). The willingness-to-pay values were VND185,350 and 484,077 respectively, the means in the log-transformed scale being significantly different (P-value<0.05). No significant difference was found for education and income. It notes that due to limited space, only selected data are presented. Full data are available from the authors upon request.

Table 4.1.1: Demographic characteristics of respondents

Characteristics	Women						Men	
	Prenatal		Postpartum		Overall			
	No.	(%)	No.	(%)	No.	(%)	No.	(%)
Education levels								
Primary school	90	(46.15)	88	(44.0)	178	(44.9)	63	(32.3)
Secondary school	65	(33.33)	65	(32.5)	130	(32.8)	78	(39.5)
High school	16	(8.21)	21	(10.5)	37	(9.3)	39	(20.0)
Certificate/diploma/university	10	(5.13)	5	(2.5)	15	(3.8)	3	(1.5)
Not complete primary school	6	(4.10)	16	(8.0)	22	(5.8)	5	(2.6)
Never attend school	8	(3.08)	5	(2.5)	13	(3.4)	8	(4.1)
Occupation								
Farmer	165	(84.2)	163	(81.5)	328	(82.8)	158	(80.6)
Non-farming workers	31	(15.8)	37	(18.5)	68	(17.2)	38	(19.4)
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Age	25.39	(4.29)	26.53	(4.87)	25.96	(4.62)	28.88	(4.68)
Household income (log-transformed)	13.25	(0.60)	13.12	(0.59)	13.18	(0.60)		
n	196		200		396		196	

Note: SD: Standard Deviation

4.1.3.3 Willingness-to-pay of prenatal group versus postpartum group

Of the 97 women who actually gave birth at home, only 17.5 percent still preferred delivery at home with a health worker, 13.5 percent with a traditional birth attendant, whilst 11.3 percent preferred to go to a district hospital, and 58.7 percent to a commune health centre. Of the 83 respondents who delivered at a commune health centre, most of them still preferred to give birth there whereas 7.8 percent preferred to go to a district hospital. On the other hand, of the 19 respondents who gave birth at district hospital, 68.4 percent of them still preferred to give birth there whereas 31.6 percent preferred to go to a commune health centre. The means of the log-transformed willingness-to-pay values were 12.60, 11.07, 10.63, and 10.23 (equivalent to VND296,558, VND64,215, VND41,357, and VND27,723) for district hospital, commune health centre, home delivery with a health worker, and home delivery with traditional birth attendant, respectively.

In the postpartum group, there was no difference in transformed willingness-to-pay mean values for the preference of the district hospital based delivery among those who actually gave birth at a district hospital, commune health centre and at home (P-value=0.35). Similarly, no significant difference was found in the transformed willingness-to-pay mean values for the preference of the commune health centre based delivery among these sub-groups (P-value=0.43).

We next investigated any difference in willingness-to-pay values between the prenatal (client) and postpartum (ex-client) groups. The transformed willingness-to-pay means in prenatal group were 12.25 (equivalent to VND208,981) for district hospital based-, 10.96 (equivalent to VND57,526) for commune health centre based-, 10.62 (equivalent to VND40,946) for home based with a health worker, and 10.22 (equivalent to VND27,447) for home based delivery with a traditional birth attendant. There was no significant difference in willingness-to-pay between these two groups.

Table 4.1.2: Willingness-to-pay for delivery services by income and study groups

		Postpartum group				Antenatal group				Men's group		
Delivery preferences	No.	log-mean	(SD)	mean in VND	No.	log-mean	(SD)	mean in VND	No.	log-mean	(SD)	Mean in VND
District Hospital based delivery												
Income												
≥500,000	19	12.44	(1.06)	252,711	12	12.63	(1.03)	305,590	12	12.2 *	(0.80)	198,789
<500,000	12	11.96	(1.01)	156,373	4	12.54	(1.17)	279,288	12	11.3	(0.68)	80,822
Total	31	12.25	(1.05)	208,981	16	12.61	(1.03)	299,539	24	11.75	(0.86)	126,753
Commune Health Centre based delivery												
Income												
≥500,000	78	10.96	(0.72)	57,526	103	11.09	(0.70)	65,513	67	11.20	(0.91)	73,130
<500,000	60	10.92	(0.62)	55,271	45	11.01	(0.72)	60,476	80	11.12	(0.98)	67,508
Total	138	10.95	(0.70)	56,954	148	11.07	(0.71)	64,215	147	11.15	(0.95)	69,564
Home delivery by Health Workers												
Income												
≥500,000	13	10.62	(0.43)	40,946	13	10.67	(1.02)	43,045	8	10.49	(0.48)	35,954
<500,000	5	10.63	(0.53)	41,357	5	10.53	(0.42)	37,421	5	10.80	(0.92)	49,021
Total	18	10.62	(0.45)	40,946	18	10.63	(0.89)	41,357	13	10.61	(0.66)	40,538

Delivery preferences	**Postpartum group**				**Antenatal group**				**Men's group**			
	No.	log-mean	(SD)	mean in VND	No.	log-mean	(SD)	mean in VND	No.	log-mean	(SD)	Mean in VND
Home delivery by Traditional Birth Attendants												
Income												
≥500,000	9	10.23	(0.41)	27,723	5	10.21	(0.16)	27,174	3	10.75	(0.87)	46,630
<500,000	3	10.17	(0.90)	26,108	2	10.70	(0.68)	44,356	5	10.77	(0.01)	47,572
Total	12	10.21	(0.52)	27,173	7	10.35	(0.61)	31,257	8	10.76	(0.44)	47,099

Note:

P-value<0.05

SD: Standard Deviation

VND: Vietnamese Dong

4.1.3.4 Willingness-to-pay of women versus men

Willingness-to-pay values between pregnant women and their partners were compared for the 134 couples in which both had the same preference. The transformed willingness-to-pay values for women and men were 11.52 (equivalent to VND100,710) and 11.85 (VND140,710) for district hospital and 11.06 (VND63,577) and 11.09 (VND65,513) for commune health centre based delivery. Again, no significant difference was found (P-value=0.08 and 0.36, respectively).

4.1.3.5 Association between willingness-to-pay and satisfaction of the quality

Of the mothers who responded on the quality of delivery services they had received, 55 percent reported that they were satisfied, 30 percent were dissatisfied and 15 percent had a neutral opinion. The relationships between satisfaction with the actual received services and preferred alternative are presented in Table 4.1.3. As can be seen from the table, when women were satisfied with quality of a given service, they tended to choose it in the willingness-to-pay survey. When they were not, they were likely to prefer other alternatives. For instance, of 75 women who gave birth at a commune health centre and still asserted their preference for this setting for delivery, 86.7 percent were satisfied with the services provided compared to 13.3 percent either dissatisfied or who had a neutral opinion. Similar results were observed for those who delivered at district hospital and at home. However, significant associations were observed only for women who delivered at a commune health centre and district hospital (P-value<0.05).

To examine whether satisfaction with the quality of the received service could influence the stated willingness-to-pay value, we compared willingness-to-pay values between the satisfied and dissatisfied/neutral opinion groups. To simplify data interpretation, we only analysed data for women whose actual and hypothetical deliveries were the same. We found that when women were satisfied with the service, they were likely to pay more. For actual delivery at a commune health centre, the log-transformed mean willingness-to-pay values were 11.15 (equivalent to VND69,564) and 10.86 (equivalent to VND52,052) (P-value<0.05), and in case of delivery at district hospital, they were 12.45(equivalent to VND255,250) and 11.84 (equivalent to VND138,690) for satisfied and non-satisfied groups, respectively (P-value<0.05).

Table 4.1.3: Association between satisfaction and hypothetical preference

	Delivery preferences															
	CHC				DH				Home delivery by HW				Home delivery by TBA			
	Satisfied		Not-satisfied		Satisfied		Not-satisfied		Satisfied		Not-satisfied		Satisfied		Not-satisfied	
	No.	(%)	No.	(%)	No.	(%)	No.	(%)	No.	(%)	No.	(%)	No.	(%)	No.	(%)
Delivered at CHC* n=83	65	(86.7)	10	(13.3)	2	(25.0)	6	(75.0)								
Delivered at DH* n=19	1	(16.2)	5	(83.3)	11	(84.6)	2	(15.4)								
Delivered at home n=97	14	(25.0)	42	(75.0)	4	(36.4)	7	(63.6)	9	(52.9)	8	(47.1)	6	(46.2)	7	(53.8)

Note: Data available for 199 women in postpartum group; not-satisfied includes dissatisfied and neutral responses

[*] P-value < 0.05

DH: district hospital, CHC: commune health centre, HW: health worker, TBA: traditional birth attendant

4.1.3.6 Association between willingness-to-pay and perception of costs

In rural areas of Vietnam, when a woman gives birth, she often has to pay direct (e.g. consultation, medical procedure, drugs) and indirect (e.g. transportation, gifts or money to health staff) 'out of pocket' costs. Information on direct and indirect costs was collected from 175 respondents in the postpartum group (25 did not respond). The average direct costs for home-, commune health centre- and district hospital-based deliveries were VND51,558 (n=77), VND54,855 (n=82), and VND546,875 (n=16) respectively, and average indirect costs VND7,805, VND5,663 and VND302,812 respectively (US\$1 $\approx$ VND15,000 in August 2000). While the proportion of indirect costs to total costs was 13 percent for home- and 9 percent for commune health centre-based deliveries, these costs contributed 36 percent to the total costs of district hospital-based deliveries.

With respect to the appropriateness of the amount paid for delivery, 45 percent of the mothers said expensive, 24 percent cheap, and 31 percent had a neutral opinion. The relationship between perception of the paid costs (expensive versus cheap/neutral opinion) and the hypothetical delivery preference was next investigated. For all postpartum subgroups, namely commune health centre, district hospital and at home, no significant association was evident between these two variables (P-value = 0.38, 0.56 and 0.28, respectively). Moreover, for women who had delivered at district hospital and commune health centres, no significant association between the perception of paid costs and willingness-to-pay value was observed (P-value = 0.26 and 0.35, respectively).

4.1.3.7 Reasons for hypothetical preferences

Relationships between the stated preferences and willingness-to-pay values were next explored. While some women preferred another delivery alternative as a result of 'a bad experience' with their previous delivery, others were unable to choose their preferred service due to economic, social or geographical barriers. Most respondents (90.6%) preferring district hospital based delivery perceived better quality of services for both mothers and newborns. They considered the district hospital service worthwhile and emphasized the importance of good obstetricians and modern medical equipment at the district hospital, despite the greater travel distance and

additional payments, including gifts to doctors, on top of the hospital bill. Some women alluded to their negative experience of delivery at home or at a commune health centre and believed district hospital could better satisfy their expectations.

Amongst those who preferred to deliver at a commune health centre, the main reasons for their preference were 'good quality' (70.4%), 'convenient/comfortable' (48.6%), 'cheap/affordable costs' (28.3%), and location closer to home (18.4%). Moreover, some respondents mentioned the 'rude and bossy behaviour' of health workers at district hospital as the main reason to choose the commune health centre as their preferred alternative. Finally, those preferring home-based delivery emphasized the convenience of giving birth at home, such as 'do not have to go out of home', and perceived the quality of home-based delivery as being acceptable.

4.1.4 Discussion

The reliability and validity of willingness-to-pay instruments have not been adequately addressed in the literature (19-22). Despite the advantages of the willingness-to-pay method, uncertainties about reliability and validity have thus limited its application in health care decision making (4, 23). Several studies in maternity and reproductive health showed that willingness-to-pay is positively associated with income reflecting the ability to pay by clients i.e. theoretical validity (24-26). In this study, however, the relationship between willingness-to-pay and ability-to-pay could not be established for all study groups. Moreover, the willingness-to-pay instrument used had demonstrated a very high inter-rater reliability.

Since hypothetical willingness-to-pay typically overestimates real willingness-to-pay, caution must be taken when interpreting results of a willingness-to-pay survey (27, 28). Participants may exaggerate willingness-to-pay values and in real life do not necessarily behave the same way as stated in their responses. It has been recommended that the mean willingness-to-pay value should be deflated by an ad-hoc 50 percent to account for potential bias (29). In this study, no significant difference was found in mean willingness-to-pay values among women who had experience with the three tiers of delivery services and preferred the same in the survey. In addition, there were no significant differences in willingness-to-pay values

between prenatal and postpartum groups, and between male and female groups. This suggests that the elicited willingness-to-pay is likely to reflect the real value.

In many willingness-to-pay surveys, particularly in western countries, only female ex-clients and/or potential female clients were studied. To accurately estimate the total benefit of services, however, those directly and those who indirectly benefit from the health programs should be included (30). Unlike the Western society, studies in Vietnam have indicated that decision on the utilization of maternity services can be influenced by men who manage the family's resources (31, 32). Therefore, preference and willingness-to-pay of men could provide complementary data for evaluation.

A high non-response rate has been common among willingness-to-pay surveys conducted by mail or telephone due to difficulties in cognitively understanding hypothetical scenarios (8, 33, 34). In this study, using face-to-face interviews and a pre-tested questionnaire, only one subject did not participate in the survey. The feasibility of the payment card technique has been demonstrated in the context of rural Vietnam. Moreover, the high response rate reflects a feature of the collective society in which money related questions such as income and willingness-to-pay are not culturally sensitive.

There are several limitations intrinsic to the study. Firstly, the wide range of the payment card (from VND10,000 to 2,000,000) could lead to range bias (4, 33), since a few extreme values chosen by the participants may inflate or deflate the mean substantially, limiting the validity of the findings. Consequently, the payment card technique should be considered to provide an interval estimation rather than a point evaluation (8). Secondly, the study was unable to differentiate the costs of caesarean and vaginal deliveries despite the apparently large gap between them. Experiences with maternity services had an impact on the women's preferences and the willingness-to-pay value. While recent delivery experience affected preference and willingness-to-pay amongst postpartum women, responses of women in the prenatal group were more likely to be influenced by their experiences of prenatal care and/or previous deliveries. On the other hand, the responses of men seemed to be influenced by experiences that may not be directly related to maternity services. Thirdly, only

small sample sizes for the traditional birth attendant and district hospital preferences were available, which limited the statistical power. Fourthly, due to logistical limitation, inter-rater reliability was examined only in the postpartum group. Finally, it was impossible in some cases to identify whether a trained provider or a traditional birth attendant had assisted at a home-based delivery, because the respondents could only recall the name or a description of the birth attendant. Consequently, the associations of satisfaction of quality of services received with hypothetical preference and willingness-to-pay between these two subgroups could not be analyzed. So could not the associations of perception of paid costs with these two variables.

Although this study demonstrates that the willingness-to-pay instrument is feasible and relatively reliable to measure the benefit of different alternatives of delivery services in rural Vietnam, further investigations should be undertaken to confirm the validity of the payment card approach, especially with respect to vaginal and caesarean delivery services. Application of the method in other cultural or social contexts requires an appropriate adaptation taking into account characteristics of the health care system as well as socio-cultural features. Health care managers and decision makers should be encouraged to apply the willingness-to-pay approach in the evaluation of maternal health programmes, outcomes of which may improve the delivery of perinatal services, especially in rural areas of developing countries.

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4.2 Measuring client-perceived quality of maternity services in rural Vietnam

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Abstract

Objective. To examine the feasibility, reliability and validity of a 20-item scale for measuring perceived quality of maternity services provided at commune health centres in rural Vietnam.

Design. A survey of 200 women who gave birth in July-August 2000 and 196 pregnant women in 34 communes in Quang Xuong District, Thanh Hoa Province, Vietnam.

Main outcome measures. Inter-rater reliability, internal consistency and factor structure of the scale were examined. The associations between perceived quality and client characteristics were also investigated.

Results. The instrument had relatively good inter-rater reliability and internal consistency. Except for two items 'good clinical examination' and 'adequacy of health workers for women's health', the scale exhibited good agreement between the two raters, with kappa values ranging from 0.54 to 0.84. The Cronbach's alpha coefficients for the dimensions 'health care delivery', 'health facility', 'interpersonal aspects of care' and 'access to services' were 0.72, 0.64, 0.72 and 0.33, respectively. Respondents were positive on items related to the dimensions 'interpersonal aspects of care' and 'access to services', but negative to the dimensions 'health care delivery' and 'health facility'. Maternity status of clients was found to influence the perceived quality of maternity services.

Conclusions. The feasibility, reliability and validity of the instrument were established in the context of rural Vietnam. Its applications to evaluate other health care programs should be an important follow-up action for the Vietnamese government.

Key words: maternity services, multidimensional scale, quality of care, Vietnam

4.2.1 Introduction

The assessment of quality of service has posed a challenge for improving the efficiency and effectiveness of primary health care in Vietnam, where basic health services including maternal and child health services are provided at commune health centres. Most evaluation studies deal with quality either according to the 'technocratic' perspective of health care professionals or from the lay perspective of clients or communities (1). In the former perspective, services are judged to have good quality if they reach standards defined by health professionals (2-4). In the latter, clients play a central role in defining and assessing quality of health care (5-8).

There has been a debate on using client's perspective in the evaluation of quality of services. While many stakeholders have viewed the client's perspective as a meaningful indicator of health services quality, others have dismissed the views of clients as too subjective. For the latter point of view, how a client felt is important, even though the provider's assessment of reality can be different (9), because at a minimum, the subjective assessment of quality by clients still provide useful inputs to help provider understand and establish acceptable standards of services (10). As it is very difficult to assess a full range of evaluations, particularly negative ones (11, 12), client's perspective has been seen as an undetachable part of health care evaluations.

Client satisfaction has been widely used in the lay measurement of quality of health services. Despite its benefits, there has been growing criticism of its measurement. Satisfaction ratings reflect the personal preferences of the client, the client's expectations, and the realities of the received care, the latter can be affected by different components of that care (13). Satisfaction ratings, being both a measure of care and a reflection of the respondent, therefore do not reflect objective reality. To overcome this problem, some organizations emphasize the measure of client perception instead. For example, the Joint Commission on Accreditation of Healthcare Organization has replaced the term 'satisfaction' with 'perception of service' (14).

Client-perceived quality is a subjective, dynamic perception of the extent to which expected health care is received (15). The advantages of perceived quality

measurement have been pointed out by several authors (16). However, most studies on client perspective of quality of services have been conducted in developed countries (17-19), and only a few reports are available for developing countries (10, 20, 21). In general, the methods adopted in these studies were inadequately described, while the reliability and validity of the instruments used were seldom addressed, making them difficult to apply beyond their limited contexts (20, 21).

There have been few attempts at developing a multidimensional scale to measure perceived quality of care in developing countries. In a study of Bangladesh hospitals, Andaleeb (10) investigated five dimensions of perceived quality of care: responsiveness, assurance, communication, discipline, and 'bribe money' paid to health staff. Haddad *et al* (20) developed and validated a 20-item instrument for use in Guinea, with the dimensions of health care delivery, personnel and health facility. Later, Baltussen *et al* (21) adapted this scale for use in Burkina Faso, and identified via factor analysis four dimensions namely health personnel and conduct, adequacy of resources and services, health care delivery, and financial and physical accessibility of care. Although reliability and validity of the Haddad's instrument appeared to be satisfactory for Guinea and Burkina Faso, it is still necessary to justify its application in other primary health care contexts because 'the presentations of quality are based, in part, on constructs that belong to a specific context or culture' (20).

The aim of this paper is to assess the feasibility, reliability, and validity of the 20-item scale of Haddad *et al* for measuring the client-perceived quality of maternity services provided at commune health centres in rural Vietnam. By adapting the original scale of Haddad *et al* to the Vietnamese language and culture, we intended to obtain a version that is conceptually equivalence to the original instrument, while being comprehensible to the rural community of Vietnam.

4.2.2 Methods

4.2.2.1 Study design

Similar to the study conducted in Burkina Faso, we initially conducted a qualitative study with 12 in-depth interviews and 6 focus group discussions, to assess whether

the 20-item scale of Haddad *et al* was relevant to rural Vietnam. Participants of the qualitative study were women who had given birth within the last three months and thus were representative of women experiencing maternity care in rural Vietnam. The findings of the qualitative study revealed conceptual equivalence in the way rural Vietnamese and Guineans perceived the quality of services. Despite considerable overlap between the original items and the determinants defined by the Vietnamese, some of the original questions were slightly amended to reflect the context of maternity service delivery network in rural Vietnam. For instance, the item 'time spent to explain patient's illness' was modified as 'time spent to explain health status of the woman' because childbirth is generally perceived as a normal process rather than an illness in Vietnam. Opinions on the quality of services provided by the commune health centres were solicited. For each item in the questionnaire, respondents could choose one of three options: favourable (+1), neutral (0) and unfavourable (-1). The instrument was prepared in Vietnamese and pre-tested on a separate group of 16 women who had given birth within the three months prior to the data collection.

4.2.2.2 Subjects

The study was conducted during July-August 2000 in Quang Xuong District, Thanh Hoa Province, located 150 km south of Hanoi. The 41 communes of the district were stratified into five areas according to socio-economic and geographical conditions. A list of women who were either pregnant or had given birth within the past three months was generated from routine reports for the National Expanded Programme of Immunization, and also antenatal care provided by Commune Health Centres and Quang Xuong District Health Services. The list was considered to be complete by the local health workers. It contained 1,218 pregnant women and 1,059 women who had recently given birth. A sample of 210 pregnant women (prenatal group) and another sample of 210 women who had given birth within the past three months (postpartum group), were randomly selected from the list (18.4%). A total of 200 women (102 who delivered at a health care setting and 98 who had delivered at home) in the postpartum group, and 204 pregnant women in the prenatal group, gave their written informed consent to participate, the overall response rate being 96%. Eight subjects in the prenatal group were excluded due to incomplete information recorded in their

questionnaires. The final sample thus consisted of 396 women from 34 communes across Quang Xuong District. Eighty percent of the respondents identified themselves as farmers, and over 90% of them had received six years or more education.

To minimise possible bias in the information collected, research assistants from institutions in Hanoi visited the subjects either at home or in the rice field. Prior to interviewing the subjects, the interviewers confirmed their pregnancy status (for the prenatal group) or birth location (for the postpartum group). If a subject had been misclassified, a replacement was then randomly chosen from the list. To assess the agreement between two interviewers (raters), i.e. whether the two research assistants can obtain similar ratings for a particular variable on the same subject (inter-rater reliability), two research assistants interviewed subjects in the postpartum group twice within one week. The subjects were clearly informed about the objectives and the procedure of the study. Their participation was voluntary and they were free to withdraw at any time without any negative consequences. The protocol followed the ethical principles of the Helsinki Declaration (22) and the National Health and Medical Research Council of Australia (23), and was approved by the local health authorities and the Human Research Ethics Committee of Curtin University.

4.2.2.3 Data analysis

Factor analysis based on principal component extraction followed by oblique rotation was used to examine the structure within the adapted 20-item scale. Internal consistency of the measurement scale was investigated through the Cronbach's alpha coefficient, while inter-rater reliability was assessed by the Kappa statistic. Finally, regression analysis was used to explore the association between the characteristics of clients and their perceived quality score.

4.2.3 Results

Data of 396 subjects (196 pregnant and 200 postnatal) was analysed. The validity and reliability the instrument were analysed amongst the women in the postnatal group. The results are presented below.

4.2.3.1 Factor analysis

Results of the factor analysis are presented in Table 4.2.1. Four factors were obtained, with eigenvalues 4.41, 1.88, 1.48 and 1.14. The total variance explained was 44.5% and the communalities ranged from 0.37 to 0.63. The four factors identified, in order of percentage variance explained, may be labeled 'health care delivery' (22%), 'health facility' (9.4%), 'interpersonal aspects of care' (7.4%), and 'access to services' (5.7%). The first construct of perceived quality consisted of 7 items related to service delivery. The second construct consisted of 4 items related to the health facility. The third factor included 6 items related to communication and conduct of health staff. The last factor comprised 3 items related to access to services.

4.2.3.2 Internal consistency

Descriptive statistics for the total perceived quality of maternity services score and its sub-scales are presented in Table 4.2.2. The internal consistency, as reflected by the Cronbach's alpha coefficients, was found to be satisfactory with the exception of 'access to services'.

The item scores by postpartum and prenatal groups are presented in Table 4.2.3. The subjects responded negatively to the physical conditions of Commune Health Centres, especially medical equipment and staffing. The mean scores for items making up 'health facility' were much lower than the overall mean score of 0.72. In particular, the mean item score for 'adequacy of medical equipment' was 0.29 for postpartum and –0.18 for prenatal groups. They also responded negatively to the manner in which maternity services were delivered, especially with regard to the 'recovery of patients'. Within the dimension 'access to services', although 'ease of obtaining drugs' appeared to be highly appreciated, the respondents were rather negative with respect to 'distance to commune health centre'. In contrast, they responded positively to 'interpersonal aspects of care'. The mean scores for its underlying items (except 'time spent to explain health status') were high. This result was rather different from previous studies in which communication and conduct of health staff were negatively perceived (20, 21).

Table 4.2.1: Factor analysis and inter-rater reliability of the instrument

Items	Factors				Communality	Kappa
	1	2	3	4		
1. Health care delivery						
Good clinical examination	**0.68**	0.02	-0.29	0.03	0.56	0.39
Good diagnostic skills	**0.67**	0.14	-0.19	-0.22	0.57	0.76
Quality of dispensed drugs	**0.63**	-0.01	-0.16	0.19	0.62	0.79
Recovery of patients	**0.62**	0.30	-0.14	0.23	0.48	0.60
Prescription of drugs	**0.57**	0.19	-0.11	-0.05	0.37	0.72
Monitor of patient's recovery	**0.57**	0.16	-0.35	-0.09	0.51	0.54
Fee of provided services	**0.38**	0.05	-0.18	-0.15	0.39	0.70
2. Health facility						
Adequacy of medical equipment	0.15	**0.75**	-0.20	-0.05	0.59	0.70
Adequacy of rooms	0.21	**0.73**	-0.08	0.08	0.55	0.69
Adequacy of staffing	0.05	**0.62**	-0.11	0.16	0.46	0.54
Adequacy of health workers for women's health	0.15	**0.60**	-0.38	0.28	0.47	0.35
3. Interpersonal aspects of care						
Compassion for patients	0.25	0.16	**-0.79**	-0.04	0.63	0.84
Respect for patients	0.19	0.14	**-0.73**	-0.03	0.56	0.80
Openness to patients	0.31	0.02	**-0.65**	0.14	0.48	0.77
Honesty	0.09	0.37	**-0.56**	0.19	0.44	0.54
Time spent to explain health status of the woman	0.52	0.27	**-0.55**	0.17	0.51	0.60
Time devoted to patients	0.49	0.26	**-0.50**	-0.01	0.42	0.64
4. Access to services						
Distance to commune health centre	0.08	0.23	-0.08	**0.69**	0.53	0.74
Access to credit	0.17	0.25	-0.31	**0.54**	0.50	0.65
Ease of obtaining drugs	0.28	0.21	-0.17	**-0.45**	0.39	0.76
% variance explained after rotation	22.0%	9.4%	7.4%	5.7%		

4.2.3.3 Inter-rater reliability

Other than 'good clinical examination' (0.39) and 'adequacy of health workers for women's health' (0.35), the remaining items exhibited good agreement between the two raters, with kappa values ranging from 0.54 to 0.84; see Table 4.2.1.

Table 4.2.2: Descriptive statistics and internal consistency of subscales and the total perceived quality score

	Health care delivery	Health facility	Interpersonal aspects of care	Access to services	Total score
Number of items	7	4	6	3	20
Possible range	-7 to +7	-4 to +4	-6 to +6	-3 to +3	-20 to +20
Mean	4.52	1.57	4.95	2.26	14.19
Median	4	1	5	2	12
Standard deviation	2.06	1.74	1.49	0.92	3.98
Cronbach's alpha	0.72	0.64	0.72	0.33	0.77

4.2.3.4 Association with client characteristics

Among the various characteristics of clients (age, income, education, occupation, and maternity status), maternity status was found to influence the overall score on perceived quality of services. In particular, the prenatal group tended to have lower scores (mean = 9.36, SD = 4.20) than the postpartum group (mean = 13.48, SD = 4.67); p-value <0.001. Also, women who delivered at home (mean = 12.59, SD = 5.28) perceived significantly lower quality of delivery services than women delivered at a health setting (mean = 14.31, SD = 3.85); p-value < 0.01.

Table 4.2.3: Item scores by postpartum and prenatal groups

Items	Postpartum				Prenatal	
	Home birth		Clinic birth			
	Mean	95% CI	Mean	95% CI	Mean	95% CI
1. Health care delivery	3.52	3.01, 4.03	4.49	4.09, 4.88	3.09	2.81, 3.38
Good clinical examination	0.46	0.35, 0.57	0.59	0.49, 0.68	0.66	0.59, 0.73
Good diagnostic skills	0.41	0.29, 0.54	0.61	0.49, 0.72	0.73	0.64, 0.82
Quality of dispensed drugs	0.79	0.70, 0.88	0.83	0.75, 0.91	0.64	0.56, 0.71
Recovery of patients	0.39	0.28, 0.50	0.44	0.33, 0.54	0.21	0.14, 0.29
Prescription of drugs	0.65	0.54, 0.76	0.74	0.64, 0.53	0.53	0.44, 0.61
Monitor of patient's recovery	0.50	0.37, 0.63	0.71	0.62, 0.81	0.52	0.44, 0.61
Fee of provided services	0.71	0.61, 0.80	0.86	0.79, 0.93	0.77	0.70, 0.84
2. Health facility	**2.05**	**1.75, 2.36**	**2.06**	**1.80, 2.32**	**0.43**	**0.23, 0.63**
Adequacy of medical equipment	0.29	0.15, 0.43	0.29	0.16, 0.42	-0.18	-0.31, -0.05
Adequacy of rooms	0.54	0.43, 0.66	0.58	0.49, 0.68	0.21	0.15, 0.27
Adequacy of staffing	0.58	0.47, 0.70	0.56	0.43, 0.68	0.33	0.17, 0.47
Adequacy of health workers for women's health	0.74	0.65, 0.84	0.69	0.59, 0.79	0.16	0.07, 0.24
3. Interpersonal aspects of care	**4.93**	**4.60, 5.25**	**5.37**	**5.13, 5.61**	**4.13**	**3.91, 4.36**
Compassion for patients	0.90	0.84, 0.96	0.96	0.92, 1	0.83	0.77, 0.88
Respect for patients	0.92	0.86, 0.97	0.97	0.94, 1	0.89	0.85, 0.94
Openness to patients	0.83	0.75, 0.91	0.91	0.85, 0.97	0.79	0.73, 0.85
Honesty	0.91	0.86, 0.97	0.99	0.97, 1	0.72	0.65, 0.80
Time spent to explain health status of the woman	0.63	0.51, 0.76	0.73	0.63, 0.83	0.53	0.45, 0.61
Time devoted to patients	0.80	0.72, 0.88	0.88	0.82, 0.94	0.69	0.62, 0.75
4. Access to services	**2.31**	**2.10, 2.51**	**2.44**	**2.27, 2.61**	**1.72**	**1.59, 1.85**
Distance to commune health centre	0.71	0.60, 0.83	0.72	0.62, 0.83	0.45	0.36, 0.54
Access to credit	0.87	0.77, 0.96	0.91	0.84, 0.99	0.47	0.37, 0.57
Ease of obtaining drugs	0.93	0.86, 0.99	0.96	0.92, 1	0.92	0.88, 0.96
Total scale	**12.59**	**11.52, 13.66**	**14.31**	**13.56, 15.07**	**9.36**	**8.77, 9.96**

4.2.4 Discussion

It is known that potential confounders can be introduced in the transfer of instruments designed in one health care system to another (24). Based on the Westernised conceptual framework (5), Haddad *et al* (20) developed a 20-item scale to measure perceived quality of general primary health care in Guinea.

In the context of rural Vietnam, a Commune Health Centre typically provides a range of basic services including delivery. An officer-in-charge, such as a secondary midwife or assistant doctor specialized in maternal and child health, is responsible for running the maternity service. In addition, childbirth can be life threatening for both mother and baby, so that the perception on delivery is expected to be different from a normal health issue. Therefore, adaptation of the original scale to reflect the specific and cultural context of delivery services is necessary. Qualitative results showed that the modified instrument was conceptually equivalent to the original version, yet it was feasible and comprehensible to rural Vietnamese clients.

With regard to psychometric properties, the Vietnamese version had relatively good internal consistency and construct validity. Four factors were identified from the factor analysis: 'health care delivery', 'health facility', 'interpersonal aspects of care', and 'access to services'. Improvement in access to primary health care is an important objective of health sector reform in Vietnam and other developing countries. Therefore, this subscale on accessibility to services is useful for health professionals to evaluate the effectiveness of an existing health care delivery network.

Unlike previous studies (10, 21), our subjects responded positively to the dimension 'interpersonal aspects of care'. In the rural lowlands of Vietnam such as the Quang Xuong district, health personnel at Commune Health Centres are locally recruited and are familiar to the residents. This may explain the appreciation by respondents towards health staff. Nevertheless, the perception of 'time spent to explain the health status of the woman' was rather poor, reflecting to certain extent the current provider-centred practices in the Vietnamese health care system where counselling

has not been formally introduced and was rarely provided to clients (25).

Respondents were quite negative in their responses to the 'health facility' sub-scale. It has been established that the physical environment of health settings can impact on client-perceived quality of care (26-28). While clients may not be able to evaluate whether a specific technical procedure is appropriate, they can, however, assess quality according to the availability of medical equipment and behaviours of health staff dealing with it.

Although the communication skills and the conduct of health personnel were highly appreciated, adequacy of staffing and their competence were poorly perceived in this survey. Such a finding is consistent with the recent shortage of skilled health personnel and degraded health facilities at primary health care level in Vietnam (25, 29). After the pre-service training at medical schools, many health professionals do not have any opportunity for continuing education and consequently are not attaining prescribed national standards (25).

In the literature, inter-rater reliability of client-perceived quality of services was seldom addressed and the measurement procedure of the scale used was often not clearly described. The relatively high inter-rater reliability obtained in this study therefore complements previous findings concerning the validity of applying this 20-item scale in developing countries (20, 21). Similar to the Burkina Faso study, the Cronbach's alpha coefficient for the 'access to services' construct was relatively low. This could be attributed to the small number of items and heterogeneous characteristics of this subscale (21). Cronbach alpha is only a measure of reliability to the extent that the scale measures a single latent variable. The sub-scale 'access to services' consisted of heterogeneous items grouped a posteriori by convenience, namely, distance to commune health centre, access to credit and ease of obtaining drugs. Sub-scales derived from factor analysis are merely hypothetical concepts rather than actual measurement entities (30). The low internal consistency might also be due to the conceptual inappropriateness of the item 'access to credit'. Unlike other health care systems, 'access to credit' for primary health care in rural Vietnam is very limited, and it is still a new concept for residents of Quang Xuong district.

Further study is thus needed to improve the reliability of this instrument.

Several issues and limitations should be considered in conjunction with the findings. Firstly, the observed scores could be confounded by maternity status, parity and delivery location of the subjects. Those women who had not given birth at a Commune Health Centre recently might judge the quality of delivery services based on their past experiences with a Commune Health Centre for other (non-delivery) health services. For parous women, their perceptions of quality could be based on their previous delivery experiences as well. Similarly, a pregnant woman might judge the quality based on their experiences with antenatal care services rather than actual delivery. The influence of experience on the perception scores is consistent with the view that 'for some health problems, expectations develop during the process of health care delivery and are revised in the light of experience' (7). Secondly, the study sample was selected from a list compiled from the official reporting system. Although the routine reports of the National Expanded Programme of Immunization and antenatal care programmes were generally considered complete, selection bias could not be completely ruled out because there might be some women who delivered at home but were not captured in our list. Thirdly, the variable 'health care setting' was not included in the data analysis as the number of respondents in each institution was small.

Applying the amended 20-item scale of Haddad *et al*, we have demonstrated the feasibility, reliability and validity of the instrument for measuring client-perceived quality of delivery services in the context of rural Vietnam. It is imperative that follow-up action should be taken by the government to utilize the instrument for evaluating primary health care programs in Vietnam.

Acknowledgements

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4.3 Utilization of delivery services at the primary health care level in rural Vietnam

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Abstract

The objective of this study was to investigate factors that influence the utilization of delivery services at the primary health care level in rural Vietnam. A quantitative survey was conducted amongst 200 women who had given birth within the past three months. Focus group discussions and in-depth-interviews were then undertaken using the Attitudes-Social influence-Self efficacy model to obtain complementary information on the delivery decision. The results show that client-perceived quality of services and socio-cultural, and economic factors, rather than geographical access, can affect the utilization of delivery services. It is therefore important to improve the cost-efficiency of the health care network, and delivery services should be provided in a client-oriented manner taking into account economic, social and cultural factors.

Key words: delivery services, primary health care, utilization, Vietnam

4.3.1 Introduction

The state health care system in Vietnam is organized as a four-tiered pyramid. At the top of the pyramid is the Ministry of Health, with provincial, district and commune health authorities lying underneath. Commune Health Centre (CHC), at the bottom level, is responsible for providing primary health care including maternity services. A district hospital serves as a main referral point for all CHCs within the district. CHCs are responsible for supervising village health workers who are often community activists and primarily trained in medicine and health education activities.

Despite recent improvements in access to primary health care, the maternal mortality ratio (MMR) in Vietnam remains high. A study conducted in 2002 (Ministry of Health of Vietnam, 2003a) in seven provinces representing the seven geographical zones of Vietnam revealed a national MMR of 165 per 100,000 live births. The Ministry of Health study relatively relied on the formal reporting system so that the real MMR could be higher, especially in the mountainous and coastal areas. In response to this urgent need, a national master plan for safe motherhood for the period 2003-2010 has been developed that addresses the issues of quality of, and access to, maternal delivery services (Ministry of Health of Vietnam, 2003b).

Health sector reform was introduced into Vietnam in the early 1990's, including the introduction of user fees for health services at higher-level public health facilities and legalization of private practice. The health sector reform has had profound effects on the health sector and health seeking behaviour of the community (World Bank, 2001). In the area of maternity services, the reform offered four main delivery alternatives for rural women: CHC, district hospital, private provider, and traditional birth attendant (TBA). Although the maternity services at CHCs have been relatively highly subsidized by the government, official data showed that the utilization of delivery services at primary health care settings in rural areas is low compared to the national target. The National Committee for Population and Family Planning (NCPFP) reported that trained health workers attended about 72% of deliveries, but

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in the coastal and highland areas of Vietnam, they only attended 60% of deliveries (NCPFP, 2000).

Currently the government has implemented several interventions to improve access and quality of maternity services at CHCs. While these interventions have emphasised the upgrading of public health care facilities, procurement of medical equipment, and training for health providers (Ministry of Health of Vietnam, 2002; 2003b), the factors behind the under-utilization of services have often been neglected in the design and implementation of the interventions.

Determinants of service utilization have been the main focus in the literature. In particular, the utilization of delivery services can be influenced by the number of children in the family and distance to health facility (Mwaniki, Kabiru, & Mbugua, 2002), as well as the quality of service (Afsana & Rashid, 2001; Sauerborn, 2001). Negative perceptions and dissatisfaction with service quality also affect health seeking behaviours and the utilization of services (Dunfield, 1996; Eisner et al., 2002; O'Donnell, Rome, Godin, & Fulton, 2000; vom Eigen, Delbanco, & Phillips, 1998). Meanwhile, high costs, together with the widespread practice of 'informal' or so-called 'under the table payment' and other indirect costs, contribute to the under-utilization of public services (Kowalewski, Mujinja, & Jahn, 2002; Nahar & Costello, 1998; White, Dahlgren, & Evans, 2001). In addition to these factors, family income and ability to mobilize resources are strongly associated with the health service utilization patterns of the communities (Haddad & Fournier, 1995). Moreover, decision on the utilization of delivery services can be affected by the low socio-economic status of women in certain countries. Some women are denied access to necessary care, either because of the cultural practice of seclusion, or because decision-making is the responsibility of other members of the family, such as husbands or parents-in-law (WHO, 1999). However, previous studies on the utilization of services often focused on quantitative socio-economic and demographic variables (Diehr, Yanez, Ash, Hornbrook, & Lin, 1999) which did not explain the client's behaviour nor suggest potential intervention measures.

In Vietnam, only a few qualitative or anecdotal studies have been undertaken concerning the utilization of delivery services. A small qualitative survey was conducted to orient health education activities in the community by exploring traditional pregnancy and childbirth practices (Duong & Bale, 2000). Socio-cultural factors influencing the utilization of services in minor ethnic communities had been reported (Nhan & Mai, 1999). However, application of these findings to the broader Vietnamese context is limited. The aim of the present study is to investigate factors that influence the utilization of delivery services at the commune health level in rural Vietnam using both qualitative and quantitative methods.

4.3.2 Methods

4.3.2.1 Location

The study was conducted during June-August 2000 in Quang Xuong District, Thanh Hoa Province, which is located 150 km south of Hanoi. Quang Xuong District is divided into 41 communes, of which 9 are coastal and 32 lowland, with a total population of 240,000. The district has only one ethnic group, Kinh. Most people identified themselves as Buddhist (95%), with the remainder being Catholic (3%) or other. The population growth rate for Quang Xuong was 1.6% in 1999. The district is representative of the rural low land areas of North-Central Vietnam according to demographic and health indicators (Quang Xuong District Health Service, 2000).

4.3.2.2 Study design

Both quantitative and qualitative methods were used as outlined by Morgan (Morgan, 1998). In the quantitative survey, the 41 communes were stratified into five areas according to socio-economic and geographical conditions. To obtain a representative sample, all women delivered at a health setting or at home within the past three months were considered. The list was generated from routine reports of the National Expanded Programme of Immunization (EPI) and antenatal care provided by CHCs and Quang Xuong District Health Services, which was considered to be complete by the local health workers. From the stratified list, 105 women who delivered at a health setting and 105 at home were randomly selected. A total of 200 women, consisting of 85 delivered at CHCs (42.5%) and 17 at the district hospital (8.5%) *(setting-based group)*, and another 98 who delivered at home (49%) *(home-based group)*, gave their informed consent to participate (response rate being 95%).

Research assistants visited the subjects either at home or in the rice field. The birth location of subject was verified prior to each interview. A replacement subject was randomly chosen in the event of misclassification.

A questionnaire was developed to obtain information on already paid costs of and access to services, perceived quality of delivery services, demographics, and other related information. Client-perceived quality of delivery services at CHC was measured using a 20-item scale. The instrument comprised four dimensions: health care delivery (including 7 items: good clinical examination, good diagnostic skills, quality of dispensed drugs, recovery of patients, prescription of drugs, monitor of patient's recovery and fee of provided services), health facility (4 items: adequacy of medical equipment, adequacy of rooms, adequacy of staffing, and adequacy of health workers for women health problems), personnel (6 items: compassion, respectfulness, openness, honesty, time spent to explain illness of patients, and time devoted to patients), and access to service (3 items: distance to commune health centre, access to credit, and ease of obtaining drugs). Validity and reliability of this 20-item scale have been reported elsewhere (Duong, Binns, Lee, & Hipgrave, 2003; Haddad, Fournier, & Potvin, 1998).

During the second phase, focus group discussions and in-depth-interviews were undertaken so as to obtain complementary information not available from the structured questionnaire. Sixteen focus group discussions were held for three different groups: women who gave birth in the last 3 months, mothers/mothers-in-law, and husbands/partners. The size of the groups ranged between 6 and 8 people. Women who already participated in the quantitative survey were not selected for focus group discussion. Sixteen in-depth-interviews were also conducted with public and private providers, traditional birth attendants, and women union activists. The focus group discussions and in-depth-interviews were conducted in Vietnamese by the first author and a research assistant. The Attitudes-Social influence-Self efficacy (ASE) model (Amooti-Kaguna & Nuwaha, 2000; De Vries & Backbier, 1994; De Vries, Dijkstra, & Kuhlman, 1988) was used to explore factors influencing the utilization of delivery services. Framework of the ASE model is given in Diagram

4.3.1. Both quantitative and qualitative instruments were pre-tested for cultural sensitivity prior to actual data collection.

Diagram 4.3.1: Attitudes-Social Influence-Self Efficacy framework of delivery decision
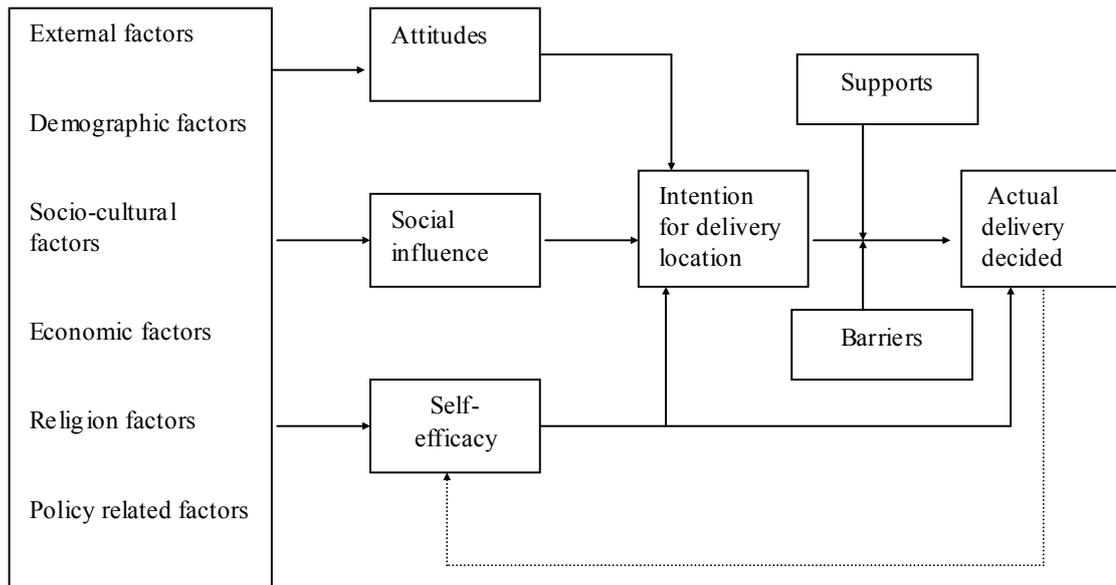
4.3.2.3 Data analysis

Quantitative data were analysed using the SPSS package. Logarithmic transformation was applied to cost of service and household expenditure and income to satisfy the normality assumption for statistical analyses. T-test and chi square test were used to compare the setting-based and home-based groups. Multivariate logistic regression analysis was conducted to examine the relationships between delivery option and independent variables.

The interviews and focus group discussions were tape-recorded and transcribed verbatim in Vietnamese. Data were coded and then analysed in Vietnamese according to the themes outlined in the ASE model so as to complement the quantitative results. Quotes were selected to represent the mentioned themes and

translated into English finally. NUDIST version 4.0 was used for text analysis and data management.

4.3.3 Results

4.3.3.1 Demographic and descriptive statistics

Demographic and descriptive statistics of the sample are provided in Table 4.3.1. About 80% of respondents identified themselves as farmers and 10% of them had never attended school or did not complete primary education. The average age was 26 years. No significant differences in education, household income and family expenditure of the last month, were found between the home-based and setting-based groups. Although the two groups were similar in age, those who had 2 or more children tended to deliver at home compared to those who gave birth for the first time; the percentage being 55.7% and 38.5% respectively.

4.3.3.2 Logistic regression analysis

We explored the relationship between delivery options and independent variables age, education, occupation, number of children, income, living status, distance to CHCs, average travel time, and four sub-scales of the 20-item scale (health care delivery, health facility, health personnel, and access to CHCs). Stepwise logistic regression analysis resulted in four significant factors namely education, number of children, living status, and sub-scale 'health care delivery', results of which are presented in Table 4.3.2. For women who passed secondary school and higher, they tended to give birth at a health setting than women who only completed primary school or less; OR=1.87 (95%CI=1.09-3.44). In addition, those who gave birth for the first time had a greater chance of delivering at a health setting than women with previous childbirth experiences; OR=1.94 (95%CI=1.03-3.64), while women living with an extended family were likely to give birth at home than those who did not; OR=0.42 (95%CI=0.21-0.84). Finally, for subjects who perceived less positively about the quality of care provided at CHCs, they were more likely to give birth at home; OR=1.18 (95%CI=1.03-1.35).

Table 4.3.1: Comparison between home-based and setting-based delivery groups

Variables	Home-based	Setting-based
Education levels (%)		
Primary school	52%	35.3%
Secondary school	25.5%	39.3%
High school	10.2%	10.8%
Certificate/diploma/university	1%	3.9%
Not complete primary school	9.2%	7.8%
Never attend school	2%	2.9%
Occupation (%)		
Farmer	84.7%	78.4%
Non-farming workers	15.3%	21.6%
Number of children *		
First child	38.5%	61.5%
More than one child	55.7%	44.3%
Living status *		
Living with extended family	54.5%	45.5%
Not living with extended family	35.1%	64.9%
Age (mean, SD)	26.92 (4.63)	26.15 (5.11)
Distance to CHC (mean, SD)	1.69 (1.30)	1.85 (3.12)
Income (log-transformed mean, SD)	13.10 (0.56)	13.14 (0.65)
Last month expenditure (log-transformed mean, SD)	12.79 (0.60)	12.80 (0.55)
Cost of services (log-transformed mean, SD) **	10.62 (0.80)	11.12 (1.18)
N	98	102

* p-value < 0.05 ** p-value < 0.01

4.3.3.3 Access to services

Women in both the home based- and setting based groups had relatively easy access to a CHC. The average distance to a CHC for the home based and setting based groups was 1.69 and 1.85 km respectively. The average time for travelling to a CHC for both groups was about 20 minutes. According to the logistic regression model,

access to services in terms of 'distance to CHC' and 'access to CHC' (sub-scale) had little influence on the delivery option.

Table 4.3.2: Logistic regression results of factors influencing delivery options

	Home based		Setting based		OR	95%CI
	No	%	No	%		
Education *						
Primary school or less	62	63.3	47	46.1	1	
Secondary school and higher	36	36.6	55	53.9	2.07	1.09-3.96
Number of children *						
More than 1 child	68	69.4	54	52.9	1	
First child	30	30.6	48	47.1	1.93	1.23-3.74
Living status *						
Not living with extended family	20	35.1	37	64.9	1	
Living with extended family	78	54.5%	65	45.5	0.42	0.21-0.84
	Mean	SD	Mean	SD		
Score of sub-scale 'health care delivery' *	12.59	5.28	14.31	3.85	1.18	1.03-1.36

* p-value < 0.05

4.3.3.4 Costs versus perceived quality of services

Financial difficulty was one reason that deterred women from giving birth at a health setting. In rural areas of Vietnam, when a woman gives birth, she often has to pay direct (e.g. consultation, medical procedure and drugs) and indirect (transportation, gifts or money to health staff, etc) 'out of pocket' costs. Estimates of direct and indirect costs were collected from 175 respondents (25 did not respond). The average direct costs for home-, CHC-, and DH- based deliveries were VND51,558 (N=77), VND54,855 (N=82), and VND546,875 (N=16), and indirect costs VND7,805, VND5,663 and VND302,812 respectively (US\$1≈VND15,000). The proportions of indirect costs to total costs were 13%, 9% and 36% for home, CHC and DH based deliveries respectively. Cost of home delivery was considerately lower than that incurred at a health setting (p-value<0.01).

Table 4.3.3: Comparison of perceived quality of care item scores between setting-based and home-based delivery groups

Items	Home-based Mean (SD)	Setting-based Mean (SD)
Health care delivery **	3.52 (2.49)	4.49 (2.01)
Good clinical examination	0.46 (0.52)	0.59 (0.49)
Good diagnostic skills *	0.41 (0.58)	0.61 (0.55)
Quality of dispensed drugs	0.79 (0.40)	0.83 (0.37)
Recovery of patients	0.39 (0.51)	0.44 (0.58)
Prescription of drugs	0.65 (0.50)	0.74 (0.47)
Monitor of patient's recovery **	0.50 (0.59)	0.71 (0.45)
Fee of provided services *	0.71 (0.45)	0.86 (0.35)
Health facility	2.05 (1.47)	2.06 (1.34)
Adequacy of medical equipment	0.29 (0.66)	0.29 (0.63)
Adequacy of rooms	0.54 (0.54)	0.58 (0.50)
Adequacy of staffing	0.58 (0.54)	0.56 (0.62)
Adequacy of health workers	0.74 (0.46)	0.69 (0.49)
Communication and conduct of personnel *	4.93 (1.61)	5.37 (1.22)
Compassion for patients	0.90 (0.29)	0.96 (0.19)
Respect for patients	0.92 (0.27)	0.97 (0.16)
Openness to patients	0.83 (0.38)	0.91 (0.28)
Honesty *	0.91 (0.28)	0.99 (0.01)
Time spent to explain patient illness	0.63 (0.59)	0.73 (0.49)
Time devoted to patients	0.80 (0.40)	0.88 (0.33)
Access to services	2.31 (0.99)	2.44 (0.86)
Distance to commune health centre	0.71 (0.56)	0.72 (0.53)
Access to credit	0.87 (0.83)	0.91 (0.35)
Ease of obtaining drugs	0.93 (0.30)	0.96 (0.20)
Perceived quality of care: total score **	12.59 (5.28)	14.31 (3.85)

* p-value < 0.05   ** p-value < 0.01

Table 4.3.3 compares the perceived quality of care between the setting- and home-based groups. According to the overall mean score, women using the setting-based services tended to have better appreciation of the quality of delivery services provided at CHC than those delivered at home (p-value<0.01). Although the two groups had similar ratings in *health facility* and *access to services*, there were significant differences in mean scores for sub-scales *health care delivery* (p-value<0.01) and *communication and conduct of personnel* (p-value<0.05). In particular, the setting-based group scored significantly higher on individual items 'good diagnostic skills' (p-value<0.05), 'monitoring of patient's recovery' (p-value<0.01), 'fee of the provided services' (p-value<0.05), and 'honesty of health staff' (p-value<0.05). However, only the sub-scale *'health care delivery'* was associated with the choice of delivery in the multivariate model.

There is some limitation in the quantitative data concerning influence of costs and perceived quality on the utilization of delivery services. For instance, the data represented only perceived quality score for CHCs but not for other alternatives. For women who did not deliver at a CHC, the perceived quality scores probably reflected their expectation of delivery services based on previous experiences (for example antenatal care services) or other people's experiences. In addition, costs of home delivery services were not separately analysed by trained providers and TBA, because some respondents could not differentiate the birth attendant was a trained health worker or a TBA. Nevertheless, qualitative data could provide some complementary information. See themes identified in the qualitative study in Table 4.3.4.

From the qualitative analysis, we found that the quality of services provided at a CHC was perceived as reasonable and costs were cheaper than the district hospital. In general, interpersonal communication skills and conduct of health personnel at CHCs were highly appreciated, while limitation of medical equipment and technical capacity of health personnel were also realized.

> 'The commune clinic in my place is so poor. Medical instrument is so old and rusty... yet the head of clinic was a responsible and careful man. He was well trained in the army'.
>
> A woman aged 23, gave birth at a CHC

Table 4.3.4: Identified themes on factors influencing delivery decision

	Home-based	CHC-based	District hospital based
Cost of services	Cheap Flexible payment	Cheap/affordable	Expensive 'Extra' costs
Perceived quality	TBA has a good conducts Communication of providers They understand my needs They spend time for me They respect me They encourage me They are skilful	Conducts of providers Communication of providers They take care of me They are patient to me Poor medical equipment Technical capacity of health workers Quality of provided drugs	Conducts of providers Communication of providers They take care of me They are less patient to me Good medical equipment Good quality of provided drugs Delivery is safe Availability of good doctors
Access to services	I can call for a TBA or private providers anytime	Close distance but not 24 hour services	Rather far distance Transportation means to hospital is difficult
Economic conditions	Availability of cash, family income	Family income	Availability of cash, family income, savings
Influence of family	Mother/mother-in-law Husband/partner	Mother/mother-in-law Husband/partner	Husband/partner
Socio-cultural	Less empowered/position in the family Making decision in family Marital status/single mother Child birth is normal	Support of husband/close relatives/friends Shared workload Neighbourhood assistance Making decision in family Child birth is normal	Access to family budget Support of husband/close relatives/friends Making decision in family

Table 4.3.4: Identified themes on factors influencing delivery decision (continue)

	Home-based	CHC-based	District hospital based
Population policy	Violation of population policy: being fined when having third child or close birth space		
Religions	Protect baby from ghosts/bad luck		
Previous experiences with childbirth	Previous childbirth is easy Bad experiences with health settings Antenatal care experiences	Satisfaction with commune health workers Antenatal care experiences	Needs of high quality doctors
Perceived barriers and support	Perceived childbirth is normal Perceived convenience of home delivery Lack of knowledge and understanding of childbirth Unpreparedness for childbirth Heavy family workload Husband/close relatives not are available or busy	Support of husband/close relatives/friends Shared workload Concerns of safety of mother and baby	Support of husband/close relatives/friends Safety of mother and baby is a priority Concerns of delivery complication

Yet in some cases, respondents complained of the rude and bossy behaviours of health workers, which deterred women from visiting a CHC.

> 'Once an assistant doctor examined my pregnancy. She asked me whether I had a bath before going to clinic that really made me embarrass. After examination, I asked her to explain further my pregnant status and why I had to take so many drugs. She did not answer me as if she did not hear what I said. When I asked her again, she shouted at me 'why do you talk too much' and repeated 'you have to take a bath before going to a CHC'.
>
> A woman, aged 19, delivered at home

The perceived total quality scores were not significantly different between those delivered at the district hospital and those at the CHCs (p-value=0.61). The preference of delivery at the district hospital may be explained by qualitative data. In Quang Xuong district, giving birth at a district hospital was considered to be a 'luxury decision' as the costs were expensive but the quality was more guaranteed. Perceived disadvantages of delivery at this referral setting also included long distance and associated expensive costs. Nevertheless, people still preferred to go there when complications were likely to occur. The perception of guaranteed quality of services, in this case, overweighed the perceived disadvantages at the district hospital.

> 'My wife had her operation at the district hospital. It was so stressful and expensive but I accept it all as it guaranteed to save my wife and my son. I had to sell off two cows and other things to pay doctors there.'
>
> Men aged 29, whose wife delivered at the district hospital

According to Quang Xuong district health reports, the home delivery rate was about 40%. In all 41 communes, private providers are available to attend deliveries. Private providers are often retired health workers well known in the community. Most health workers in public settings also provide private practice from their home. In case of complications, private providers will bring their clients to the district hospital using their own network of connections. Delivery at home, attended by private providers, was thought to be convenient, affordable and safe. It is slightly more expensive than at a CHC, but still cheaper than at the district hospital.

> 'We invited Ms X [a midwife] to attend the delivery at our home. She had worked well at the clinic for many years... Anyway, we still had to pay for that [delivery services]. So we pay directly to her. She billed me the same as in the CHC but we had to buy some more medicine from her'.
>
> A woman aged 32 who delivered at home

Practice of TBAs was observed in the communes in this study. In each commune there were 3 to 6 TBAs, especially in Quang Nham, a coastal commune, there were 15 active TBAs. TBAs have good credibility in the community. They typically have

practised for many years and attended generations of deliveries in the commune. Some respondents expressed that TBA did not work just for money as they had a 'good heart' and the 'kindness of a mother'. They would attend the delivery upon being called, and received whatever the family gave them in return: a dozen eggs, a small amount of money, or simply assisting the TBA's family during the harvesting season. Most of the cases went smoothly. If complications did occur at delivery, it was often attributed to the woman's destiny rather than blaming the TBA. The following quotation illustrates their perception about TBAs.

'She was a very kind person. She assisted many women in the village to give birth but never asked for money. Her hands were so skilful and she always encouraged me as my mother. I knew that if I gave her some money she would refuse, so I gave her a dozen of eggs and a satin scarf that I knew she liked.'

A woman aged 25, who delivered at home

4.3.3.5 Experiences with prenatal care at CHCs

Qualitative data suggested that prenatal experiences of women at CHCs played an important role in their decision on delivery locations. According to the current practice at Quang Xuong, pregnant women were registered at their commune settings where prenatal care was subsidized by the government. They were recommended by health workers to visit CHCs for prenatal care check-ups on a 'pregnant day'- every sixteenth of the month. It seems that if a woman was not satisfied with the quality of antenatal care services at a CHC, she would not choose this setting for delivery but seek other alternatives subsequently.

'On the 'pregnant day', the CHC was full of people, and I had to wait for a long time. It was free but quality is not good. I attended only once. Then I asked Ms X [a midwife] to examine me at home as her private client'.

A woman aged 32 who delivered at home

4.3.3.6 Socio-cultural factors

Logistic regression analysis indicated that those who lived with an extended family tended to deliver at home. In Quang Xuong, young couples often lived with their extended family and the family income was under the control of the parents-in-law and/or husband. The wife was in a vulnerable position, especially when the family

resources were scarce. If a couple lived independently from their parents, the wife had a better chance to access money and to make her own decision. In addition, the childbirth experience of mother and/or mother-in-law could influence the final decision. An old woman whose daughter-in-law recently gave birth at home told the interviewer the following:

> 'Young women today are so complicated and demanding. I had all my eight births at home and we were all right. Delivery was as simple as a mosquito bite. I told my children that they do not have to go anywhere. Stay at home and I invite her [TBA] to come. My children are big but they are so inexperienced.'
>
> A mother-in-law aged 64

The quantitative analysis also indicated that home-based delivery was linked to less education. Nevertheless, an educated woman who was fully aware of the advantages of delivery at a health setting still could not overturn the decision or influence of her mother-in-law. The following case is an example.

> 'My husband and I really wanted to deliver at the district hospital, as it was located near the school where I worked. I also had a friend working there. But my parents-in-law asked us why I did not give birth in the CHC close to our home. My husband supported my wish but he did not want to upset his parents. His mother decided the whole thing, even down to choosing the name for my son.'
>
> A primary school teacher aged 25, who delivered at a CHC

The patriarchal nature of the society, indeed, had strong effects on the delivery options as well as reflecting the status of women in the society. In some cases, women were empowered to keep the money for the family. However, she had to consult her husband on her spending. During the interviews, some women said they jointly made the decision on delivery location with their husbands, yet they also admitted that the family resources were still under the control of the men. Consequently, they were reluctant to make the decision on their own.

> 'I started labour in the morning for several hours. It was not really as painful as others had described. My husband said he would be back at noon. I really wanted to have him accompany me to the commune clinic... Then my mother came to see me and forced me to go to clinic, but

it was rather late and the baby nearly came out. My mother and neighbours helped me to deliver and latter on they called an assistant doctor to see the baby and me.'

<div align="right">A woman aged 28, who delivered at home</div>

Childbirth was commonly perceived as the product of a marital relationship. For a single mother or a woman who lived in a de facto relationship, she could feel stigmatised or discriminated against by health workers or other people at a health setting. Therefore, they would choose to deliver at home to avoid embarrassing situations.

'In my village, there was a single pregnant woman. She was very lonely and often stigmatised by her neighbours. I always tried to encourage her to go to the CHC for antenatal care but she had never done it. She gave birth at home with a TBA and moved to live in another area after that'.

<div align="right">A Women Union activist aged 43</div>

4.3.3.7 Religion factor

Religious beliefs could influence the delivery options. In one commune in the study, where most of the deliveries took place at home, there were a number of practising TBA's, even though the CHC was staffed with 5 health workers and located in the centre of the commune. Some women reported that they attended the CHC for antenatal care, and brought their children there for immunization, but still decided to give birth at home. Apparently, the CHC was located next door to a sacred joss house for fishermen and there had been a rumour of ghosts living around the joss house. To avoid misfortune, it was suggested to stay away from this religious site during childbirth. The following comments about the location of the CHC are illustrative.

'It was said the clinic was near a demoniac place. Demon could take the soul of the baby. I do not know if it is true. So it is better to be safe and deliver elsewhere'.

<div align="right">A mother in law aged 55</div>

4.3.3.8 Influence of coercive population policy

The 1993 National Population Policy that stipulated a maximum of two children per family with a birth spacing of three to five years had an impact on childbirth decisions. The gender of the baby was often considered to be more important than how to make the delivery safe. For women having a third child and above, or those

<div align="right">128</div>

whose birth spacing was too close, they were under pressure of criticism and/or discrimination by the health workers, who were responsible for keeping the population growth under control. As a consequence, these women preferred to deliver at home to avoid verbal abuse or discrimination.

'It was a mistake because we really did not want to have more children. We had one son and one daughter already. When I found out that I was pregnant, I was very worried. But I did not want to have an abortion, as it was so sinful. Nobody in my family would agree to abortion. So we decided to keep the baby. I was so ashamed during the pregnancy when some neighbours and health workers criticized me. When I went for antenatal care at the CHC, everybody pointed at my belly and laughed at my face. My husband recommended me to deliver at the CHC, as I was not young anymore. But I did not want to go there. I chose to deliver at home because it was a lot easier'.

Woman aged 38, who delivered at home

4.3.3.9 Perceived barriers and support

Some women had intended to give birth at a CHC, but the delivery actually occurred at home because of poor preparedness due to financial constraints, heavy workload, lack of knowledge and understanding about childbirth. In Quang Xuong, women constituted a major part of the family labour force. Men often worked away from home as migrant workers, and farming work was then left to the women. The workload of women during pregnancy was not reduced and they might still work in the field until the day of delivery.

'I experienced the first delivery at home. At that time, I had a problem with the placenta and a lot of bleeding. I was so scared. This time, I really wanted to deliver my baby at the commune health centre. However, labour started when I was still in the field replanting. I just felt pain in my back and hip. My husband wanted to carry me to the commune health centre. But it was too late and my baby started to come. I was so scared of bleeding, but thank God, I was so lucky.'

A woman aged 27, who delivered at home

When a woman gave birth at a health setting, one or two persons were often required to accompany the woman. Health workers provided only medical services; meals and personal hygienic tasks were left to family members. It became very difficult if the couple did not have any helpers, especially during harvesting and planting periods. In

contrast, delivery at home had the advantage of a familiar environment with family, relatives or friends providing support and care.

> 'Giving birth at CHC is a good idea, but the whole family has to stay in the centre to help the mother and baby. I prefer to invite a doctor to attend the delivery at home and everybody can still work'.
>
> A man aged 28, whose wife delivered at CHC

Finally, logistic regression analysis found that those women with childbirth experiences were likely to deliver at home compared with women who gave birth the first time; OR=1.94. Home-based delivery could be associated with the perception that childbirth was a normal process, especially for women who had given birth.

> 'My first son was delivered at home. When I was pregnant the second time, a woman from the Women's Union recommended that I deliver at the CHC. But since my first child was very easy to deliver, the second should be even easier. So I did give birth at home. Both of us were fine'.
>
> Woman aged 26, who delivered at home

4.3.4 Discussion

In our study, physical access to a CHC was relatively easy (less than 2 km on average) and unlikely led to a low utilization of delivery services at this level. Similarly, a study in Nepal found that the coverage of antenatal care accounted for only 32% of deliveries within 5 km from the health facilities, suggesting that the under-utilization of delivery services cannot be simply explained by geographical access to health care alone (Jahn, Dar Iang, Shah, & Diesfeld, 2000).

Perception of the quality of services is likely to contribute to the low rate of setting based delivery. Women realized the importance of facility, medical equipment and personnel. They were also interested in how services were delivered, including the capacity of health workers (such as their diagnostic and prescriptive skills), quality of dispensed drugs, and outcomes of the treatment. Provider-client relationships had a major impact on the perception of the quality of services, and in turn the utilization of delivery services. Abusive and harassment behaviours of health workers were known to be barriers to access and utilization (Amooti-Kaguna & Nuwaha, 2000;

Grossmann-Kendall, Filippi, De Koninck, & Kanhonou, 2001; Jewkes, Abrahams, & Mvo, 1998; Lazarus, 1994).

The study found that women who actually chose a health setting for delivery perceived a higher quality of delivery services provided at the CHC than those gave birth at home. The perception of the latter group is likely based on their previous experiences with CHC. In addition, decision on delivery locations could be influenced by prenatal care experiences. However, quantitative information was unavailable concerning the utilization and satisfaction of antenatal services, so that a causal relationship between quality of antenatal care and delivery options could not be examined. Moreover, the instrument used in this study also focused on CHCs rather than other alternatives.

Cost of services was an important factor that affected the delivery option. In addition to the formal fee, indirect costs such as transportation, bribe money and time were incurred at a health setting. Studies in other countries also found that hidden costs could contribute to a low utilization of maternity services, especially among low-income groups (Abel-Smith & Rawal, 1992; Nahar & Costello, 1998). However, even though costs of services were high, if the quality of such services was perceived to be high, people would be still willing to pay for them (Duong, Vinh, Hipgrave, Binns, & Lee, 2003).

In Quang Xuong district, social, cultural and religious factors appeared to contribute to the low utilization of delivery services at the primary health care level. In a collective society such as Vietnam, childbirth experiences of the parents greatly influenced the delivery choices of young people. The low utilization was also linked to the Confucian culture, which placed women in a disadvantaged position where she had to comply with the decision of her husband and parents-in-law (Gammeltoft, 1999). Women could feel stigmatised and discriminated against at a health setting because of their low educational and economic background, or simply due to their 'legal' maternal status. A study in Bangladesh found that together with costs, fear of hospitals and the stigma of an 'abnormal' birth were important constraints (Afsana & Rashid, 2001).

The perception that 'childbirth is normal' seemed to be the main reason for unpreparedness for childbirth, leading to a high rate of home-based delivery. Childbearing is known to be socially shaped and culturally specific (Cheung, 2002) . In the literature, it has been established that the provision of accessible services does not guarantee their use and that other social and cultural considerations must be taken into account (Brieger, Luchok, Eng, & Earp, 1994; Hotchkiss, 2001).

Meanwhile, the national two-child policy had exerted pressure on families already had two children or with close birth spacing (Government of Socialist Republic of Vietnam, 1993; Hoa, Toan, Johansson, Hojer, & Persson, 1996). To avoid criticism and fines, some families did not register the birth of the newborn baby until the child started school. The policy thus introduced another barrier to the utilization of maternity services at the health setting.

Several limitations should be addressed in conjunction with the findings. Firstly, the sample of home- and setting based women was drawn from the antenatal care and EPI monthly reports; therefore it was not a population-based sample despite the coverage of these programmes was reportedly very high. Secondly, quantitative data were collected from the self-report of respondents. Such information could incur recall bias, especially with regard to family income and costs of delivery services. Thirdly, in the quantitative survey, it was impossible in some cases to identify whether a trained provider or a TBA assisted a home-based delivery, because the respondents could only recall the name or a description of the birth attendant. Consequently, a comparison between these two subgroups could not be made.

By applying a combination of qualitative and quantitative methods, this study concluded that client-perceived quality of services, socio-cultural, and economic factors influenced the utilization of maternity services at the primary health level in rural Vietnam. Improvement in the efficiency of the peripheral health care delivery network requires substantial efforts beyond investment on health care infrastructure. Delivery service should be provided in a client-oriented manner taking into account social and cultural factors as well as other local features.

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4.4. Breastfeeding initiation and exclusive breastfeeding in rural Vietnam

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Abstract

Objective: To investigate the initiation of breastfeeding and exclusive breastfeeding within the first week after delivery for women in rural Vietnam.

Design: An interviewer-administered survey was conducted on a sample of rural women who gave birth during August-October 2002.

Setting: Quang Xuong District, Thanh Hoa Province of Vietnam.

Subjects: 463 women participated in the study of whom 181 delivered at the district hospital (39.1%), 229 at a commune health centre (49.4%), and 53 at home attended by a traditional birth attendant (11.4%).

Results: Although the initiation and exclusive breastfeeding rates were relatively high at 98.3% and 83.6% respectively, the premature introduction of complementary food was a great concern. Logistic regression analysis showed that, together with socio-cultural determinants such as feeding preferences of husband and maternal grandmother, feeding practice of friends, factors relating to delivery methods, delivery locations and health problems could influence the initiation rate and breastfeeding patterns.

Conclusions: To promote breastfeeding practices of rural mothers, health education on breastfeeding should take into account local socio-cultural features in addition to improving the counselling skills of health workers.

Key words:

Initiation rate, exclusive breastfeeding, complementary food, infant feeding, Vietnam

4.4.1 Introduction

Breastfeeding, particularly exclusive breastfeeding (EBF), and appropriate complementary feeding practices, are universally accepted as the essential elements for the satisfactory growth and development of infants as well as the prevention of childhood illness. The value of breastmilk as a source of nutrition and as a preventive measure to protect children from diarrhoea and acute respiratory infections, as well as its psychological benefits, have been reported in several studies (1, 2). The World Health Organization has recommended that infants should be exclusively breastfed for the first six months with the introduction of appropriate complementary foods and continued breastfeeding thereafter (3).

In Vietnam, despite the recent progress in economic development and improved living standards, malnutrition in children under five years old remains a major public health concern. With 39% of children under five years of age malnourished in terms of weight-for-age, and 34% undernourished in terms of height-for-age, Vietnam has one of the highest child malnutrition rates in Southeast Asia. Even in provinces with relatively high living standards and improved health care, the rate of malnutrition is still high at 32-40%, suggesting that child malnutrition rates can be affected by other factors beyond health services coverage and income growth (4). Malnutrition can be closely linked to cultural beliefs concerning child bearing and feeding practices in the community (5). Although initial rate of breastfeeding is relatively high at 87%, the exclusive breastfeeding is low: only 31% of infants under two months of age are receive exclusive breastfeeding, and after fifth month, no infant is exclusively breastfed (6). On the other hand, the early introduction of complementary foods is also common.

Although several studies have reported on breastfeeding practices amongst Vietnamese migrants in other countries (8, 9), very few research have been undertaken in Vietnam, particularly in the rural areas of Vietnam. The association between premature initiation of complementary feeding and physical growth of children was explored in a longitudinal study (10). Factors influencing breastfeeding practices were investigated by several authors (11). However, their applications are rather restrictive due to either small sample size (11-13) or limitations in data analysis (13, 14). The aim of this study is to assess breastfeeding initiation and

exclusive breastfeeding practices within the first week of delivery for women residing in rural Vietnam.

4.4.2 Methods

The study was conducted in Quang Xuong District, Thanh Hoa Province, located 150 km south of the capital Hanoi. Quang Xuong District comprises 41 communes, of which 9 are coastal and 32 are lowland, with a total population of 240,000. The population growth rate for Quang Xuong is 1.6% according to the 1999 national census. The district is representative of the rural lowland areas of Northern Central Vietnam with respect to demographic and health indicators (15).

A total of 463 rural women who gave birth during August-October 2002 in Quang Xuong District participated in the study. With the assistance from district and commune health authorities, subjects were consecutively selected until the required sample size for sufficient statistical power (80%) was attained. For those who delivered in the district hospital (DH), participants were interviewed during their post-partum period in the hospital. For those who delivered either at a commune health centre (CHC) or at home attended by a traditional birth attendant (TBA), interviews were conducted at the CHC or at the home of participants. All mothers were interviewed within the first week after delivery, and were informed about the purpose of the study. The interviews were conducted by research assistants who attended a three-day practical training course on interview skills prior to actual data collection. Consent was sought prior to each interview, following the protocols set by the Helsinki Declaration (16) and the National Health and Medical Research Council of Australia (17). The project was approved by the local health authorities and the Human Research Ethics Committee of Curtin University.

The structured questionnaire used for interviewing subjects was adapted from that of Scott et al (18, 19). It was further pre-tested for cultural sensitivity before actual data collection. Data were coded and analysed using the SPSS package. In addition to qualitative analysis, descriptive and univariate statistics were applied to compare the exclusive and non-exclusive breastfeeding groups. Logistic regression analysis was then undertaken to explore factors affecting the exclusive breastfeeding decision.

4.4.3 Results

4.4.3.1 Demographic characteristics

All of the 463 selected women agreed to participate in the study. Table 4.4.1 presents the demographic characteristics of subjects by lactation status (EBF versus non-EBF). Significant differences were found in age, education and occupation between the EBF and non-EBF groups, but not log-income. The average age of women who practised EBF was 26.2 years (SD 4.9) compared to 27.6 years (SD 5.3) for those who did not ($p<0.05$). The non-EBF women tended to be less educated: 40.8% did not complete primary school or never attended school, and only 6.5% of them attended high school or tertiary institutions. In contrast, only 13% of those practising EBF had not completed primary school or never attended school. About 69.3% of respondents in the EBF group identified themselves as farmers, compared to 30.3% in the non-EBF group ($p<0.01$).

4.4.3.2 Low birth weight rate

Of the 463 babies born during the study period, 54.3% were male. The weight of babies was recorded in 421 cases (91%). Most of the unrecorded cases were born at home attended by a TBA. The average birth weight was 3,098 grams (SD 357). The proportion of low birth weight babies (< 2,500 grams) was 3%. No significant association was found between sex and low-birth weight status of infants.

4.4.3.3 Initiation and exclusive breastfeeding

Within a week after delivery, 98.3% of the respondents had initiated breastfeeding, with 73.6% of the mothers initiating within the first hour. Colostrum or breast milk was fed to 85.6% of babies as the first meal while the remaining 14.4% were given a fluid other than breast milk. Most babies were fed according to their needs (96.7%), with an average of 10 times within 24 hours during the first week after birth.

At one week, exclusive breastfeeding was practised by 83.6% of the mothers while the rest fed breast milk together with some complementary foods or exclusively bottle-fed their babies. The complementary foods used included sugar solutions, fruit juice, porridge, and even steamed rice. In most cases where solid food was

prematurely introduced to babies, the deliveries took place at home with the attendance of a TBA. About 7% of the mothers introduced formula to their babies, including 1.7% (8 cases) who exclusively bottle-fed. 'Suggested by relatives or friends', 'bottle feeding is easier', 'did not like breastfeeding', and 'had to work after delivery' were the common reasons given for choosing formula and/or other complementary foods.

Table 4.4.1: Demographic characteristics of respondents with and without exclusive breastfeeding

Characteristics	EBF	Non-EBF	Overall
n	387	76	463
Age *			
Mean (SD)	26.17 (4.87)	27.61 (5.34)	26.40 (4.97)
Household income (log-transformed)			
Mean (SD)	13.08 (0.68)	12.92 (0.55)	13.05 (0.66)
Occupation **			
Farmer	69.3	30.3	62.9
Non-farmer	30.7	69.7	37.1
Education **			
Tertiary/university	6.8	3.9	6.3
High school	9.4	2.6	8.2
Secondary school	61.6	32.9	56.8
Primary school	9.4	19.7	11.1
Not complete primary school	8.6	18.4	10.2
Never attend school	4.4	22.4	7.4

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

4.4.3.4 Breastfeeding decision

Most respondents decided which feeding method to use during their pregnancy (65.5%) compared to before pregnancy (15.8%), during labour (10.5%) and after

delivery (8.1%). Most of them (79%) made the decision themselves. With regard to future feeding intention, 86% of respondents indicated that they would continue exclusive breastfeeding for the next four weeks, while the rest intended to bottle-feed or use a mix of breastmilk and other foods. About 13% of mothers planned to introduce complementary foods before their baby reached 2 months, 21.3% at 2-3 months, and 51.4% at 4-6 months. Seventy percent of them intended to stop breastfeeding at 12 months, while 30% remained undecided or 'do not know'.

4.4.3.5 Perception of breastfeeding

Most of the respondents described their lactation experiences as self-confident (90%), enjoyable (93%), satisfied (81.3%), and comfortable to breastfeed their baby (91%). Reasons given for breastfeeding included 'breast milk is better for the baby' (93.8%), 'breast-feeding is cheaper' (17%), 'baby's father wanted me to breast-feed' (13.8%), and 'breast-feeding is the right thing to do' (10.9%).

4.4.3.6 Health status of mothers and infants

During the first week, 15.6% of mothers reported at least one health problem related to breastfeeding, such as inverted nipples, cracked or sore nipples, or not having enough milk or colostrum for their baby. Six percent of the infants were reported to have health problems, especially respiratory tract related conditions.

4.4.3.7 Factors affecting breastfeeding

Factors affecting exclusive breastfeeding practice were next explored using stepwise logistic regression analysis. Table 4.4.2 presents results of the final model. Except 'being given formula/sugar as gifts', all variables were statistically significant. Women who had a vaginal delivery tended to have a much higher rate of EBF than those who underwent caesarean section. Mothers who delivered at DH and CHC were more likely to practice EBF, compared to those delivered at home and being attended by a TBA; the odds ratios were 6.8 and 2.3 respectively. Feeding preferences of their maternal mother and husband, and feeding practices of friends, could also influence their decision on EBF. Mothers who faced difficulties in breastfeeding were less likely to practice EBF. Finally, if a baby was fed by colostrum/breast milk in the first meal, the likelihood for him/her to be exclusively breastfed would be substantially higher (odds ratio = 2.7).

Table 4.4.2: Logistic regression results of factors influencing decision on exclusive breastfeeding

Variables	Non-EBF		EBF		odds ratio	95% confidence interval
	No.	%	No.	%		
Being given formula/sugar as gifts						
no	52	68.4	346	89.4	1	
yes	24	31.6	41	10.6	0.39	(0.13-1.16)
Feeding preference of husband **						
other methods	34	45.3	24	6.3	1	
breastfeeding	41	54.7	358	93.7	5.37	(1.64-17.60)
Feeding preference of maternal mother *						
other methods	37	48.7	37	9.6	1	
breastfeeding	39	51.3	350	90.4	3.52	(1.21-10.28)
Feeding practice of friends **						
other methods	49	64.5	78	20.2	1	
breastfeeding	27	35.5	309	79.8	3.65	(1.34-9.97)
Delivery methods **						
caesarean section	20	26.3	9	2.3	1	
normal delivery	56	72.7	375	97.7	18.52	(5.47-62.71)
What baby was first fed *						
other foods	47	61.8	35	9.0	1	
colostrum/breast milk	29	38.2	352	91.0	2.71	(1.28-7.46)
Breastfeeding problems of mother **						
at least one problem	29	38.2	43	11.1	1	
no problem	47	61.8	344	88.9	4.54	(1.61-12.85)
Delivery setting **						
at home	38	50	15	3.9	1	
district hospital **	29	38.2	152	39.3	6.80	(2.73-16.92)
commune health centre	9	11.8	220	56.8	2.31	(0.84-6.35)

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

4.4.4 Discussion

Given the high reported breastfeeding initiation rates in Vietnam, it is not surprising that nearly all the respondents initiated breastfeeding (20). The 2002 Demographic and Health Survey reported a rate of initiation breastfeeding in the Northern Central region of 93.8% (6). Although the high initiation rate is encouraging compared to Western countries (21, 22), the premature introduction of complementary foods, often within the first week of delivery is a concern. Despite the efforts of national health education programmes on breastfeeding, many respondents still intended to introduce complementary food before the baby reaches six months of age. It has been suggested in a recent study (13) that 'poverty might encourage early breastfeeding in the sense that women do not see an alternative source of food for their babies'. However, the rapid social and economic changes taking place in Vietnam have posed a threat to breastfeeding (12). In our study, some women practising EBF expressed their desire to use formula if they could afford it. Therefore, once formula products become more readily available and affordable in Quang Xuong District, it is likely that EBF will drop below the current rate of 84%.

The small proportion of low birth weight infants observed in this sample is reasonable in view of the estimated rate of 7% by the General Statistical Office of Vietnam (20). Another survey of 7 provinces by the Ministry of Health in 1999 reported that the proportion had varied between 3.2% and 11.6% (23). It should be noted that over-estimation of infant's weight by the mother during the interview is possible, but such recall bias may be considered minimal within one week of delivery.

In this study 14.4% babies were not fed colostrum/milk as their first meal. Some mothers believed that colostrum has little value or may even harm the baby's health. In the hospital setting, we observed that a few mothers were directed by relatives to discard colostrum in order to avoid 'bad luck'.

The patriarchal nature of the Vietnamese society can affect lactation practices. It has been reported that male children could receive better nutrition (4) and education (24) than their female counterparts, and that male babies in developing countries were

more likely to be breastfed and/or breastfed longer (25). However, there was no evidence from this study that gender preference could significantly influence breastfeeding patterns at this stage of infancy.

It appears that health related problems of the women can also affect their lactation decision or practice; especially for those experiencing caesarean section, there is an increased likelihood not to exclusively breastfeed. The influence of caesarean section on the initiation rate has been examined in the literature (26, 27). For woman who requires caesarean section, the baby is often taken away. Furthermore, in case the mother is administered antibiotics, the general perception in the rural community is that the milk becomes contaminated and should not be given to the baby. Similarly, problems such as inverted, cracked or sore nipples can discourage attempts by women to breastfeed.

Within a historically Confucian culture, the breastfeeding practice of rural Vietnamese women is expected to be influenced by husband and senior members of the family. Although 80% of participants reported they could make the decision themselves on breastfeeding practice, we still found that husband and maternal mother could substantially influence their decision on this issue, as the breastfeeding practices of friends. This finding is consistent with the literature that attitudes of spouse (18), parents (28) and relatives (29) play an important role in determining the initiation and duration of breastfeeding.

Finally, health care providers had a considerable impact on breastfeeding practices. Women who delivered at home with a TBA were less likely to receive appropriate instruction on breastfeeding. Although breastfeeding is recommended to commence immediately after birth (3, 30), the initiation rate of breastfeeding within the first hour by this group was only 24.6%, compared to 73.6% and 85% respectively for babies delivered at DH and CHC. The higher rate of breastfeeding initiation at the health institutions could be attributed to the counselling efforts by health workers during antenatal care and post delivery visits.

We conclude that despite the relatively high initiation and exclusive breastfeeding rates in rural Vietnam, the premature introduction of complementary food is of great concern. Together with socio-cultural determinants such as feeding preferences of husband and family members, factors relating to the health of mothers such as delivery methods and delivery locations could influence the initiation rate and breastfeeding patterns. To promote good breastfeeding practices, in addition to improving the counselling skills of health workers in prenatal care visits, it is important that health promotion on breastfeeding in the community should target not only pregnant women but also family members, especially husbands/partners taking into account traditional and socio-cultural features of rural Vietnam.

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4.5 Introduction of complementary food to infants within the first six months postpartum in rural Vietnam

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Abstract

Aim: To document the introduction of complementary food and factors influencing decision to feed infants with solid food within six months postpartum in rural Vietnam.

Methods: A longitudinal study of 463 rural women was conducted during August-October 2002 in rural Vietnam.

Results: An early introduction of complementary food was found, which increased from 16.4% at week one to 56.5% at week 16 and nearly 100% at week 24. Home-cooked solid food was introduced by 4.8%, 40.9% and 74.3% of women at weeks 1, 16 and 24, respectively. Logistic regression analysis found that at week 24 postpartum, it was less likely for the infant to be fed with solid food if the woman was a farmer (OR=0.52, 95% CI: 0.18-0.95) and passed secondary school (OR=0.28, 95% CI: 0.10-0.54), whose husband was satisfied with the infant's sex (OR=0.30, 95% CI: 0.17-0.53), her mother-in-law preferred exclusive breastfeeding (OR=0.18, 95% CI: 0.04-0.75), or her friends practiced exclusive breastfeeding (OR=0.41, 95% CI: 0.16-1.10). However, infants were likely to be fed with solid food when their parents had higher income and lived independently (OR=1.76. 95% CI: 1.01-3.06).

Conclusion: Community mobilization for sharing the workload with women could help them to cope with employment and breastfeeding.

Key words: Breastfeeding, complementary food, infant feeding, solid food, Vietnam

4.5.1 Introduction

According to a report of the World Health Organization (WHO) in 2003, malnutrition has been responsible, directly and indirectly, for 60% of the 10.9 million deaths among children under five. Over two-thirds of these deaths are associated with inappropriate feeding practices and occur during the first year of life (1). In Vietnam, although the malnutrition situation among children under 5 years old has greatly improved compared to the 1990s, the malnutrition rate is still high with weight-for-age and height-for-weight malnutrition rates at 30.1% and 33%, respectively (2). In addition, the disparities between regions are quite large. For instance, the respective weight-for-age and height-for-weight malnutrition rates are 36.0% and 39.4% in the North Central region, compared to 24.4% and 26.2% in the Southeast region of Vietnam.

Benefits of breastfeeding to infants and mothers, particularly exclusive breastfeeding (EBF), have been widely recognised in the literature (3, 4). WHO has recommended that infants should be exclusively breastfed for the first six months with the introduction of appropriate complementary food and continued breastfeeding thereafter (5). However, the early introduction of complementary food, including solid food, remains a common phenomenon around the world, and the pattern of feeding varies across countries (6-9).

Similar to experiences in other countries, the trend of breastfeeding in Vietnam has been discouraging. The 2002 Demographic and Health Survey reported that only 31% of infants aged less than 2 months were exclusively breastfed, and after the fifth month, no infant was being exclusively breastfed (10). Compared to the 1997 Demographic and Health Survey, there appeared to be a decreasing trend of EBF in favour of an early introduction of complementary food. In particular, the proportion of infants under 4 months old who are exclusively breastfed has reduced from 27% in 1997 to 20% in 2002 (10).

This longitudinal study investigates the introduction of complementary food and factors affecting the decision to feed infants with solid food within the first six months postpartum amongst women residing in the rural Northern Central region of

Vietnam. In this study, EBF means infants were fed only breast milk from the mother or a wet nurse, or expressed breast milk, and no other liquids or solids with the exception of drops or syrups containing vitamins, mineral supplements, or medicine (11). Solid food includes all type of non-drinkable food made by either the food industry or by the family.

4.5.2 Methods

4.5.2.1 Location

This longitudinal study was conducted in Quang Xuong District, Thanh Hoa Province, located 150 km south of Hanoi. The district is representative of the Northern Central region of Vietnam based on demographic and health indicators (12).

4.5.2.2 Study design and interview

According to the 1999 national census, the total population of Quang Xuong district was 240,000. It was estimated that about 3,400 babies were born in the district in 2002. A sample of 463 rural women who gave birth during August-October 2002 in Quang Xuong district was enrolled in the study, accounting for 13.4% of babies born in 2002. The women sampled were representative of the population of interest. For the initial survey, subjects were interviewed within the first week after delivery. Mothers were consecutively selected until the required sample size for sufficient statistical power (80%) was attained. For those who delivered in the District Hospital (DH), research assistants interviewed them during their post-partum period in the hospital. For those who delivered either at a commune health centre (CHC) or at home attended by a Traditional Birth Attendant (TBA), interviews were conducted at CHCs or at the home of subjects. Subjects were then followed up at home at weeks 16 and 24. The structured questionnaires used were adapted from those of Scott et al (13) and pre-tested for cultural sensitivity prior to actual data collection. Subjects were asked information relating to their infant feeding practice within the past 24 hours. With regard to the selection of formula, mothers were asked the name of the brand, and the interviewers checked the actual brand used in the previous day to avoid potential misclassification. Information on feeding preference of

husband/partner and other close relatives was gathered indirectly from the interviews.

4.5.2.3 Statistical analysis

Data were analysed using the SPSS package (14). In addition to descriptive statistics and univariate tests to compare feeding patterns, logistic regression analysis was undertaken to explore factors affecting the decision on feeding solid food at week 16 and week 24 postpartum.

4.5.3 Results

4.5.3.1 Demographic characteristics

The initial survey included 463 women, with high participation rates at the follow-up surveys; only 3 subjects at week 16 and 4 subjects at week 24 missed the interviews. Of the respondents, 181 delivered at DH (39.1%), 229 at CHCs (49.5%), and 53 at home (11.4%). The average age of the cohort was 26.40 years at baseline survey (SD=4.97). About 47% of them had monthly family income between VND 500,000 and 1,000,000, and about 40% between VND 200,000 and 500,000 (US$1 $\approx$ VND 15,500). More than half of them passed lower secondary school, 8.2% passed high school and 6.3% had diploma or university degree while 18% did not complete primary school or never attended school. About 63% of the subjects identified themselves as farmers. Of the 463 babies born during the study period, 54.3% were male.

4.5.3.2 Infant feeding patterns

Table 4.5.1 shows the feeding patterns when infants were 1, 16 and 24 weeks old. The complementary feeding rate increased from 16.4% at week 1 to 56.5% at week 16 and nearly 100% at week 24. The rate of breastfeeding together with drinkable and solid food such as porridge or steamed rice increased considerably at weeks 16 (23.5%) and 24 (61%). For breastfeeding together with home cooked rice solution *(nuoc chao)* and other drinkable food, the proportion was similar between weeks 1 and 16 (about 5%), but rose sharply to 24.4% at week 24. The rate of formula and cow milk together with solid and other drinkable food increased at week 16 (17.4%), but slightly declined at week 24 (13.3%). Exclusive bottle-feeding with formula or

cow milk accounted for a very small proportion of the participants at the initial and follow-up surveys.

Table 4.5.1: Feeding patterns for infants at weeks 1, 16 and 24

	Week 1		Week 16		Week 24	
	n	(%)	n	(%)	n	(%)
Exclusive breastfeeding	387	(83.6)	200	(43.5)	2	(0.4)
Breast-feeding together with bottle feeding	22	(4.7)	46	(10.0)	1	(0.2)
Breast-feeding together with drinkable food	21	(4.5)	23	(5.0)	112	(24.4)
Breast-feeding together with solid and drinkable food	22	(4.8)	108	(23.5)	280	(61.0)
Bottle-feeding only	8	(1.7)	1	(0.2)	1	(0.2)
Bottle-feeding together with solid and/or drinkable food	0	(0)	80	(17.4)	61	(13.4)
Other types	3	(0.7)	2	(0.4)	2	(0.4)
N	463		460		459	

4.5.3.3 Formula and milk feedings

The use of formula for infants increased from 4.4% at week 1 to 16.2% at week 16, but decreased to 6.3% at week 24. Local formulas *Dielac* and *Ridielac* were the most widely consumed (76%) whereas imported brands were not popular. Cow milk and other milks used at week 1, week 16 and week 24 were 2.5%, 12.2% and 7.4% respectively. 'Influence of formula advertisement' and 'follow other people who used formula in health setting' were the most common reasons for choosing these two formulas, which accounted for 53% and 27% of the total responses respectively. Most of the subjects (98%) were exposed to commercial advertisement of formula through the mass media especially television.

4.5.3.4 Drinkable food

Water, fruit juice, and rice solution (*nuoc chao*) were the most common drinks for infants at weeks 16 and 24: water was used by 57.1% and 90.4% of subjects, fruit juice by 14.7% and 19.4%, rice solution by 5.0% and 24.4%, respectively.

4.5.3.5 Solid food

Solid food was introduced very early to infants by 4.8% of the cohort at week 1. The use of formula and cow milk decreased while the use of solid food increased significantly from 40.9% at week 16 to 74.3% at week 24 (p-value<0.01). In all cases, home-cooked meals were used to feed infants.

4.5.3.6 Ingredients of home-cooked food

Three popular types of home cooked solid food were rice porridge (*chao dac*), rice-floured porridge (*bot*) and steam rice. The main ingredients used to prepare these were rice, meat and egg. Over 40% of cases used monosodium glutamate to cook food for their infants.

4.5.3.7 Feeding frequency

In all three surveys, over 95% of infants were fed on demand. The mean number of feeds within 24 hours reduced slightly over time: 10.2 times (SD=3.2) at week 1, 9.7 (SD=3.4) at week 16, and 9.2 (SD=2.5) at week 24. For those infants whom solid food was introduced to, they were fed more than twice per day.

4.5.3.8 Reasons for changing feeding patterns

At week 16, most of the women (95%) already returned to work. Reasons for changing the feeding pattern included 'do not have sufficient milk', 'for better health of infants', 'returning to work', 'and 'complementary food is good for health'. Unlike the first two reasons, the proportion of the latter two appeared to change significantly from week 16 to week 24, from 46.2% to 38.6% and from 19.8% to 56%, respectively (p-value<0.05).

4.5.3.9 Knowledge of lactation mechanism and nutrition

Women generally had poor knowledge of the milk-production mechanism. By week 24, about 65% of surveyed women believed that feeding formula to one-month-old

baby would not reduce the amount of milk produced by the mother. In addition, 97% of the surveyed women believed that formula is necessary whenever they cannot produce enough milk.

4.5.3.10 Health education on breastfeeding for mothers

In the initial survey, for women who delivered at a health setting, 79.6% reported being encouraged by health workers to breastfeed their infants immediately after birth and 76.1% feeding on demand during their stay in the hospital or CHCs. However, only 22% of the respondents reported receiving information, education and communication materials on breastfeeding, 37.6% of them receiving demonstrations on breastfeeding, and 7.5% having individual consultation or discussion with health workers about breastfeeding.

4.5.3.11 Factors influencing decision to feed infants with solid food

Factors affecting the decision on feeding solid food to infants at weeks 16 and 24 were investigated using stepwise logistic regression analysis. Table 4.5.2 and Table 4.5.3 present results of the final models. At week 16, it was less probable for infants to be fed with solid food if the husband was a farmer (odds ratios (OR) = 0.47) or preferred breastfeeding (OR=0.38). For woman who had achieved a high education level, there was less chance of feeding her infant with solid food (OR=0.35). On the other hand, if she had a vaginal delivery she tended to feed the infant with solid food (OR=3.29). The infant was likely to be fed with solid food when the parents lived independently, compared to those who lived with their extended family. Finally, an infant was likely to be fed with solid food (OR=1.91) if he/she had health problems within 16 weeks of life.

At week 24, except 'education level' and 'living status', the factors affecting the feeding decision were different. There was less likelihood for the infant to be fed with solid food if the mother was a farmer (OR=0.52). The views of husband/partner, mother-in-law, and friends were also associated with the feeding practice. It was less probable for infants to be fed with solid food if the woman's mother-in-law preferred breastfeeding (OR=0.18) or her friends practiced breastfeeding (OR=0.41). Similarly, if the husband was satisfied with the sex of infant, the infant was less likely to be fed with solid food (OR=0.30). Possible association was also found

between the family income and feeding solid food (OR=1.74). Finally, it appeared that parity, birth location, and health status of mother did not influence the decision to feed solid food at both week 16 and week 24.

Table 4.5.2: Logistic regression results of factors influencing decision on feeding solid food at week 16

(N=396[a])

Variables	No solid food fed		Solid food fed		Odds ratio	95% CI
	n	%	n	%		
Education level**						
Primary school or lower	38	14.2	94	49.5	1.00	
Secondary school and higher	230	85.8	96	50.5	0.35	0.19-0.64
Delivery method*						
Caesarean section	22	8.2	7	3.7	1.00	
Vaginal delivery	247	91.8	181	96.3	3.29	1.02-10.60
Health problem(s) of infant**						
No	186	72.1	83	47.4	1.00	
Yes	72	27.9	92	52.6	1.91	1.18-3.10
Feeding preference of husband**						
Other[b]	206	76.3	170	89.5	1.00	
Exclusive breastfeeding	64	23.7	20	10.5	0.38	0.20-0.75
Occupation of husband**						
Non-farmer	70	25.9	113	59.5	1.00	
Farmer	200	74.1	77	40.5	0.47	0.28-0.80
Living status*						
Living in extended family	117	43.7	59	31.2	1.00	
Living independently	151	56.3	130	68.8	1.71	1.05-2.79

* p-value < 0.05, ** p-value < 0.01
[a]: data are missing
[b]: non-exclusive breastfeeding or did not care how infants are fed

4.5.4 Discussion

Although the rates of breastfeeding initiation and EBF were high at week one, the rate of EBF sharply decreased at week 16 and week 24. On the other hand, complementary food was commonly used to feed infants at a very early stage. This trend is consistent with findings of other research in Vietnam and elsewhere (10, 15, 16). However, the EBF rates estimated in our study were higher than those of other studies in the same year. The 2002 Demographic and Health Survey found that only 31% of infants less than two months of age were exclusively breastfed. The rate declined rapidly to 12.1% when infants were 2-3 months of age, and 7.7% when they became 4-5 months of age. However, the discrepancies in rates could be due to the different research methods used. Another national nutrition survey in 2002 based on a sample of 1,500 children from 30 communes reported the proportion of infants less than 4 months of age exclusively breastfed accounted for 29.2% (2). It noted that while the disparities in health indicators among geo-ecological regions of Vietnam were relatively large, the 2002 Demographic and Health Survey used a very small sample when calculating the national EBF rate. This longitudinal study, on the other hand, utilised a cohort sample representative of the rural North Central region of Vietnam to estimate the rates. The interviews conducted at regular intervals had allowed us to measure changes in infant feeding with reasonable accuracy. This particularly applies to EBF and the introduction of solids. Our previous studies suggested that in cross–sectional studies mothers could recall breastfeeding rates accurately. However, the timing of the introduction of solid foods appeared to be less accurately recalled, which can lead to heaping of responses in cross–sectional studies (17).

The early introduction of solid food is a concern to public health workers. This study found that some infants were fed with solid food just a few weeks after delivery. The cooked food included rice and meat, while fish, vegetables and oil were less used. This reflected the traditional beliefs that fish and oil, even fruit juice, could cause diarrhoea whereas vegetables were perceived as unimportant for the infant's health. Some mothers believed that monosodium glutamate was good for health and development. However, studies have shown that early introduction of certain types of

vegetables and meat could affect the absorption of iron from breast milk (18), and increase the risk of allergy (19).

Table 4.5.3: Logistic regression results of factors influencing decision on feeding solid food at week 24

(N=411[a])

Variables	No solid food fed		Solid food fed		Odds ratio	95% CI
	n	%	n	%		
Occupation of woman *						
Non-farmer	22	18.8	148	43.3	1.00	
Farmer	95	81.2	194	56.7	0.52	0.18-0.95
Education level **						
Primary school or lower	9	7.8	122	35.7	1.00	
Secondary school and higher	122	92.2	220	64.3	0.28	0.10-0.54
Living status*						
Living in extended family	82	70.1	211	61.7	1.00	
Living independently	35	29.9	131	38.3	1.76	1.01-3.06
Husband satisfied with infant's sex **						
Not satisfied / neutral opinion	27	23.1	137	40.1	1.00	
Satisfied	90	76.9	205	59.9	0.30	0.17-0.53
Feeding preference of mother-in-law *						
Other[b]	5	4.3	90	26.3	1.00	
Exclusive breastfeeding	112	95.7	252	73.7	0.18	0.04-0.75
Breastfeeding practice of friends *						
Other[b]	12	10.3	114	33.3	1.00	
Exclusive breastfeeding	105	89.7	228	66.7	0.41	0.16-1.10
Family income**					1.47	1.29-1.67

* p-value < 0.05, ** p-value < 0.01
[a]: data are missing
[b]: non-exclusive breastfeeding or did not care how infants are fed

Media is pervasive and powerful and has the potential to affect social norms about breastfeeding and decision making (20). This study found that 98% of the respondents were exposed to formula commercials via the mass media. Of the mothers who used formula for their babies, about 53% decided to buy a particular brand after seeing the commercial advertisement, and 27% followed the bottle-feeding experiences of others, despite considerable efforts have been spent in providing a supporting environment for breastfeeding at health settings. The Ministry of Health of Vietnam issued a national regulation on the marketing of breast milk substitutes in 1994, following the code on marketing of breast milk substitutes established by WHO. Under the national regulation, advertisements of formula directly targeting infants under 6 months of age are not allowed in any of the mass media. However, the marketing advertisement most often seen in Vietnamese television portrays a small baby together with a 'miracle' formula and the nature of the message indirectly encourages mothers to use formula for young infants.

We also found that many women did not understand the mechanisms of human milk-production. This might contribute to a high rate of early introduction of complementary food. Mothers' poor knowledge on breastfeeding was likely a consequence of insufficient health education provided by health care professionals, who could be a negative source of support if their lack of knowledge resulted in inaccurate or inconsistent advice (4)

In rural Vietnam, women contribute a major part of the family labour force. In Quang Xuong district, by week 16, nearly all mothers had already returned to normal work while still taking care of their infants. Pressure of workload at the early postpartum stage is likely to prevent mothers from practising EBF. Feeding infants with complementary food, especially with solid food, gave mothers more time to earn living for the family. Studies in developing countries also showed an inverse relationship between employment and breastfeeding (21-23).

 In this study, it was less likely for farmers to feed their infants with solid food. Evidence also suggested that whenever a woman did not live in an extended family where workload was often shared with other family members, it was likely for her

infants to be fed with solid food. Moreover, there was an association between the reported views of husband/partner, mother-in-law, and friends on breastfeeding and the feeding practice of infants. Indeed, the attitudes of close relatives could play an important role in the initiation of breastfeeding and EBF practice within the first week postpartum (24).

In the literature, the relationship between breastfeeding and mode of delivery was inconsistent. While some studies found little evidence (25, 26), others have observed a negative association between caesarean delivery and breastfeeding initiation (27) but not duration of breastfeeding (28). In this study, women who had vaginal deliveries were more likely to feed their infants with solid food compared to those who had caesarean deliveries.

Health risks posed to mothers and children due to non-EBF have been documented in the literature (29, 30). However, the effect of breastfeeding on maternal health was not investigated in this study. Because of the short period of follow-up, the impact of premature introduction of complementary food on health and physical development of infants could not be quantified.

Several limitations should be considered in conjunction with the findings. Firstly, our questionnaire was adapted from that used previously in a developed country and several developing countries. The questionnaire was translated into Vietnamese and tested in focus groups for clarity of understanding and cultural sensitivity. More detailed reliability tests of the instrument in a developing country such as Vietnam should be undertaken. Secondly, information on maturity of pregnancy, length of stay in the health facilities and housing environment, were either unavailable or not collected. Consequently, the effects of these variables on the mother's decision to introduce complementary food could not be examined. Thirdly, the influence of health providers in terms of consultation, medications or other therapies during the postpartum period on the feeding patterns was not addressed in this study.

Premature introduction of complementary food to infants in rural Vietnam is of great public health concern. As women return to work at the early postpartum period, mobilizing the participation of the community and family to share the workload thus

plays a crucial role in the improvement of exclusive breastfeeding practice. In view of the findings, health education on breastfeeding should target not only women but also their husbands and close relatives. The health education should include information on the benefits of breastfeeding and the problems that can occur when solids are introduced too early, including the risk of reducing breast milk supply. Finally, Vietnamese authorities should closely monitor formula promotion activities in the mass media and health care settings to ensure that advertising does not breach the code on marketing of breast milk substitutes.

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4.6 Determinants of breastfeeding within the first six months postpartum in rural Vietnam

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Abstract

Aim: This study explored the determinants of breastfeeding practices within the first six months postpartum amongst women residing in rural Vietnam.

Methods: The study was conducted in Quang Xuong district, Thanh Hoa Province of Vietnam. In the first phase, 463 women were prospectively studied at weeks 1, 16 and 24 postpartum. During the second phase, sixteen focus group discussions were undertaken to obtain complementary information.

Results: Exclusive breastfeeding dropped from 83.6% at week 1 to 43.6% at week 16, and by week 24, no infant was exclusively breastfed. Logistic regression analysis found 'mother's education level', 'mother's decision-making on breastfeeding', 'mother's comfort to breastfeed in public places', 'father's occupation', 'feeding preference of father', and 'having sufficient food for the family' significantly influenced the exclusive breastfeeding practice. Qualitative data provided in-depth information on factors relating to mother, infant, close relatives, and providers.

Conclusions: Providing appropriate training and supportive supervision on breastfeeding counselling to health workers, and supporting working mothers to exclusively breastfeed their infants through community mobilization were recommended to improve breastfeeding in rural Vietnam.

Key words: Breastfeeding, determinants, feeding patterns, longitudinal study, Vietnam

4.6.1 Introduction

According to the World Health Organization (WHO) malnutrition contributes directly or indirectly 60% of the 10.9 million deaths annually amongst children under five (1). In Vietnam, despite the recent improvement in national health indicators, malnutrition in children under five years old remains a major public health concern. With 30% of children under five years of age malnourished in terms of weight-for-age, and 33% undernourished in terms of height-for-age, Vietnam has one of the highest child malnutrition rates in Southeast Asia (2).

Inappropriate infant feeding practice is an important factor contributing to the malnutrition of children (3, 4). In Vietnam, although the WHO has recommended that infants should be exclusively breastfed for the first six months with the introduction of appropriate complementary foods and continued breastfeeding thereafter (5), recent studies showed that only 31% of infants aged less than 2 months were exclusively breastfed, and after the fifth month, no infant was being exclusively breastfed. There has been a decreasing trend of exclusive breastfeeding (EBF) in favour of an early introduction of complementary food. Typically, the proportion of infants under 4 months old who are exclusively breastfed has reduced from 27% in 1997 to 20% in 2002 (6).

Factors influencing breastfeeding have been investigated in the international literature. Mother-related factors such as employment and perceived insufficient breast milk, and infant-related factors were reported (7-9). Breastfeeding could be influenced by health providers (10) and marketing of the formula industry (11). In addition, cultural environment was found to affect breastfeeding practice (12).

It is known the factors affecting breastfeeding may operate differently across countries (13). Despite the alarming decline in exclusive breastfeeding rate in Vietnam, there have been few studies specifically focused on determinants of breastfeeding (14-17). Moreover, their applications are rather restrictive due to either small sample size (14, 15) or limitations in data analysis (16, 17). This study explores factors influencing breastfeeding practices within the first six months postpartum amongst women residing in the rural Northern Central region of Vietnam using a combination of qualitative and quantitative methods.

4.6.2 Methods

4.6.2.1 Location

This study was conducted in Quang Xuong District, Thanh Hoa Province, located 150 km south of Hanoi. Quang Xuong District is divided into 41 communes, of which nine are coastal and 32 lowland, with a total population of 240,000. The population growth rate for Quang Xuong was 1.6% in the national census of 1999. The district is representative of the Northern Central Vietnam according to demographic and health indicators (18).

4.6.2.2 Study design

The study consisted of two phases. A longitudinal study was first conducted during August 2002-May 2003. A sample of 463 rural women who gave birth during August-October 2002 was enrolled in the study. For the initial survey, subjects were interviewed within the first week after delivery. Research assistants were given information about deliveries by district and commune health authorities. For those who delivered in the District Hospital (DH), research assistants interviewed them during their post-partum period in the hospital. For those who delivered either at a commune health centre (CHC) or at home attended by a Traditional Birth Attendant (TBA), interviews were conducted at CHCs or at the home of subjects. Subjects were consecutively selected until the required sample size for sufficient statistical power (80%) was attained. Subjects were then followed up at home during weeks 16 and 24. In the surveys, subjects were asked information relating to infant feeding practice within the past 24 hours. In the initial survey, the weight of infants at birth was based on the recall of the mothers while in the follow-up surveys, their weight was scaled by the research assistants immediately after the interview.

In the second phase, 16 focus group discussions were undertaken during May-June 2004. The objective was to obtain complementary information not available from the quantitative surveys. These included women within the first six months postpartum (six groups), men whose partners were within the first six months postpartum (six groups), and commune health workers (four groups). The size of the groups ranged

between 6 and 8 people. The focus group discussions were conducted in Vietnamese by the first author and a research assistant.

For the quantitative surveys, the structured questionnaires used were adapted from those of Scott et al (19, 20). Both quantitative and qualitative instruments were pre-tested for cultural sensitivity prior to actual data collection.

Subjects were informed about the purpose of the study and asked to give their formal consent to participation. The protocol followed the ethical principles of the Helsinki Declaration (21) and the National Health and Medical Research Council of Australia (22), and was approved by the local health authorities and the Human Research Ethics Committee of Curtin University.

4.6.2.3 Data analysis

Quantitative data were analysed using the SPSS package (SPSS Inc., Chicago, Il, USA). In addition to descriptive statistics, logistic regression analysis was undertaken to explore factors that affected breastfeeding at week 16 and week 24 postpartum. For the qualitative survey, focus group discussions were tape-recorded and transcribed verbatim in Vietnamese. Data were coded and then analysed in Vietnamese so as to complement the quantitative results. Quotes were selected to represent themes and translated into English finally. In our study, exclusive breastfeeding is defined as feeding infants by only breast milk from the mother or a wet nurse, or expressed breast milk, but no other liquids or solids with the exception of drops or syrups consisting vitamins, mineral supplements, or medicine. Complementary feeding means feeding infants with both breast milk, and non-human milk, or semi-solid or solid food. Predominant breastfeeding means the predominant source of nourishment is breast milk, yet infants may also receive water and water-based drinks such as sugar solution and fruit juice, and drops and syrup forms of vitamins, minerals, or medicine (23).

4.6.3 Results

4.6.3.1 Demographic characteristics

The initial survey included 463 women, with high participation rates at the follow-up surveys, as only 3 and 4 cases missed the interviews at week 16 and week 24

respectively. Of the respondents, 181 delivered at DH (39.1%), 229 at CHCs (49.5%), and 53 at home (11.4%). The average age of the cohort was 26.40 years at baseline survey (SD=4.97). About 47% of them have family income between VND 500,000 and 1,000,000, and about 40% between VND 200,000 and 500,000 (US$1 ≈ VND 15,500). More than half of them passed secondary school, 8.2% passed high school and 6.3% had diploma or university degree while 18% did not complete primary school or never attended school. About 63% of the subjects identified themselves as farmers.

4.6.3.2 Infant's feeding patterns

Table 4.6.1 shows the main feeding patterns when infants were 1, 16 and 24 weeks old. Exclusive breastfeeding dropped from 83.6% at week 1 to 43.6% at week 16, and by the week 24, only 2 cases were exclusively breastfed (0.4%). On the other hand, complementary feeding increased from 9.5% at week 1 to 33.5% at week 16 and 61.2% at week 24. Predominant feeding increased from 4.5% at week 1 to 5% at week 16 and 24.4% at week 24. Infants who were not breastfed accounted for a small proportion at week 1 (2.4%), but increased to 18% at week 16 and 14% at week 24.

Table 4.6.1: Feeding patterns at weeks 1, 16 and 24

	Week 1		Week 16		Week 24	
Feeding patterns	N	%	N	%	N	%
Exclusive breastfeeding	387	83.6	200	43.5	2	0.4
Predominant feeding	21	4.5	23	5	112	24.4
Complementary feeding	44	9.5	154	33.5	281	61.2
Non-breastfeeding	11	2.4	83	18	64	14.0
N	463		460		459	

4.6.3.3 Logistic regression analysis

Factors affecting exclusive breastfeeding practice at week 16 were explored using stepwise logistic regression analysis. Table 4.6.2 presents results of the final model. The six significant variables found were 'mother's education level', 'mother's decision-making on breastfeeding', 'mother's comfort to breastfeed in public places',

'father's occupation', 'feeding preference of father', and 'having sufficient food for the family'. With regard to the discontinuation of breastfeeding at week 24, a separate logistic regression analysis found 'mother's satisfaction with the weight of the infant' as the only significant variable.

Table 4.6.2: Logistic regression results of factors influencing exclusive breastfeeding at week 16

(N = 324)[†]

Variables	EBF		Non-EBF		Odds ratio	95% CI
	No.	%	No.	%		
Education level **						
Primary school or lower	94	71.2	38	28.8	1.00	
Secondary school and higher	96	29.4	230	70.6	6.45	2.75-15.09
Husband's occupation *						
Non-farmer	113	61.7	70	38.3	1.00	
Farmer	77	23.8	200	72.2	2.11	1.17-3.81
Sufficient food during the year *						
No	33	68.8	15	31.3	1.0	
Yes	156	38.7	247	61.3	4.16	1.02-9.83
Mother made her own decision on feeding *						
No	47	48.5	50	51.5	1.00	
Yes	143	39.4	220	60.6	2.14	1.09-4.13
Feeding preference of father *						
Other	170	45.2	206	54.8	1.00	
Breastfeeding	20	23.8	64	76.2	4.92	2.43-9.98
Uncomfortable to breastfeed in public places **						
No	213	84.5	39	15.5	1.00	
Yes	164	79.2	43	20.8	0.45	0.25-0.80

*: P-value$\leq$0.05; **: P-value$\leq$0.01

[†]: 136 cases were excluded in logistics regression analysis due to missing value

4.6.3.4 Mother related factors

<u>Education level</u>

As indicated in Table 4.6.2, results from logistics regression analysis show that mothers who completed secondary school or higher were more likely to practice exclusive breastfeeding than those completed primary school or had a lower education (OR=6.45; 95% CI =2.75-15.09).

<u>Knowledge of lactation mechanism and nutrition</u>

Women generally had poor knowledge of the milk-production mechanism. By week 24, about 65% of surveyed women believed that feeding formula to one-month-old baby would not reduce the amount of milk produced by the mother. Qualitative data revealed their perception that breast milk would have good quality only if mothers consumed sufficiently high protein foods. Diet for mothers seemed poor, partly due to lack of understanding of postnatal nutrition. Some women said they had good nutrition within few weeks after delivery. After that they often had the same meal as other family members. We also found that some women did not eat fish, fresh vegetable and fruit as they were afraid that this food could deteriorate quality of breast milk and cause diarrhoea for infants. The lack of understanding of postnatal nutrition and lactation mechanism resulted in early introduction of complementary foods to infants, as evident from the following example:

> 'I have a lot of milk but it is very thin, because I cannot afford meat everyday. My baby is so small, so I gave him some rice solution and it seems good.'
>
> A woman aged 26

In addition, the concern of having insufficient breast milk was common amongst non-exclusive breastfeeding women. At week 24, 97% of the surveyed women believed that formula is necessary whenever they cannot produce enough milk. They appeared to lack adequate knowledge and skills to stimulate lactation. Eating more pork feet cooked with green papaya was often advised as a workable remedy, while some cases ended up with complementary feeding of infants.

'I wanted to fully breastfeed my baby but I could not, even I tried to eat as much as I could. Breast milk was not enough for the baby and she cried for a whole day. I gave up after five days and started giving her some rice porridge'.

A woman aged 19

Qualitative data suggested that some mothers were confused about 'exclusive breastfeeding'. They perceived exclusive breastfeeding as not giving solid and semi-solid foods to infants but water, fruit juice, sugar solution and even formula milk were permissible.

'In the clinic, they told me to exclusively breast my baby for at least 4 months. But I did not know that I should not give him water or cow milk. I though doctor meant I should not give him steamed rice.

A woman aged 24

Employment

Women returned to work very early after delivery. At week 16, most of the women (95%) already returned to their usual work. In Quang Xuong district, women are a major source of labour for the family. Their workload was unlikely to reduce during postnatal period, especially at planting and harvesting seasons. If their house is close to the field, they could go home at lunchtime to feed their babies.

'It is normal here that women returned to work one or two months after delivery... For my case, I can fully breastfeed my son at night. But at daytime, I could only feed him two times. My mother in law gives him some rice solution while waiting for me to come back.'

A woman aged 28

Discomfort of breastfeeding in public places

Logistic regression analysis indicated that if women did not feel comfortable to breastfeed their child in public places, they were unlikely to maintain exclusive breastfeeding practice (OR=0.45, 95%CI=0.25-0.80). In group discussions, women addressed their embarrassment of showing their breast during breastfeeding.

'I have to give breast milk to my baby in the fish market. It is the only option as I have to work. It is really embarrassed that nearly everybody watched me. I often used a *non* [a hat] to hide the head of the baby and put my eyes to other directions, but I still felt some men were watching us.'

A woman aged 26

Health related conditions

At week 16, 8% of women experienced at least one breastfeeding related problem compared to 12% of women at week 24. The main problems were 'inverted nipples', 'cracked or sore nipples', 'not enough milk for babies', and 'pain when breastfeeding'. Logistic regression analysis found that the health condition of mothers did not significantly affect breastfeeding patterns. Nevertheless, qualitative data suggested that when women were ill, they were very concerned of the low quality and quantity of breast milk, especially if they took medicine such as antibiotics.

> 'I do not give my baby breast milk when I take antibiotics. I was told that antibiotics would badly reduce the quality of milk and harm his health.'
>
> A woman aged 34

Lack of motivation

Logistic regression results suggested that when mothers made their own decision on breastfeeding, their babies were likely to be exclusively breastfed (OR=2.14, 95%CI=1.09-4.13). Qualitative data further indicated that due to financial constraints, exclusive breastfeeding seemed a practical and economical choice for many mothers. However, to maintain exclusive breastfeeding they needed ongoing motivation from close relatives and health workers.

> 'I experienced loosing milk for four days. I was so worried and wanted to give my baby some rice solution. But my mother-in-law and husband always comforted me and told me to be patient. They took care of my baby so I could sleep... A commune nurse visited me at home. She gave me a vacuum and instructed me how to use it. Thank God, after some days, milk came back.'
>
> A woman aged 30

Although some women were fully aware of the significance of breast milk for the development of the child, after struggling with insufficient milk and hardship, they started giving infants complementary food.

'I believed that breastfeeding is good. I used to exclusively breastfeed my first son for six months. But for this time, I am not able to do it because I have to work far from home. A village activist from Women Union suggested me to take the milk out and keep it in a cool place so that my mother could feed him during my absence. However, I do not have a fridge at home. I am afraid that my child could have diarrhoea.'

A mother aged 31

4.6.3.5 Infant related factors

<u>Gender of infants</u>

Of the 463 babies born during the study period, 54.3% were male and 43.7% female. There was no evidence suggesting that gender preference could significantly influence breastfeeding patterns.

<u>Physical development of infants</u>

The average weight of babies at birth was 3,098 grams (SD=357). Infants who were exclusively breastfed tended to be heavier than those fed with complementary foods. At week 16, the average weights were 6,890 grams (SD=0.765) for those exclusively breastfed, 6,730 grams (SD=0.847) for those complementarily fed with drinkable food, and 6,710 grams (SD=0.841) for those complementarily fed with solid and semi-solid food. Similar results were also found at week 24. However, significant differences were observed at week 24 (p-value<0.01) but not at week 16. Logistic regression analysis also indicated that at week 24, the satisfaction of mother with the weight of the infant could lead to continue breastfeeding (OR=4.27, 95%CI = 1.64-11.07).

<u>Infant health problems</u>

At week 16, 38% of the infants were reported having at least one health problem, mainly respiratory tract related conditions (90%), fever (43%), and diarrhoea (13%). At week 24, 42% of infants were reported to have at least one health problem, mainly respiratory tract related conditions (92%), fever (65%), and diarrhoea (26%). At week 16, infants who were exclusively breastfed reported significantly less health problems than non-exclusive breastfed infants (p-value<0.01). Logistic regression analysis found that the health condition of infants did not significantly affect breastfeeding patterns.

Nevertheless, qualitative data suggested that infant's temperament could influence the breastfeeding decision of mothers. The cry of infants or their demand for milk at night could exhaust the mothers who need to work in the field from the early morning. Some mothers then decided to give babies complementary food so that the child could sleep well.

> 'My son cried for milk several times at night that made me so tired because I had to work at six o'clock in the morning. He was hungry and could not sleep. As recommended, I gave him porridge twice per day that really make him full and quiet at night.'
>
> A mother aged 24

4.6.3.6 Factors relating to close relatives

It appears that for those fathers who were farmers and preferred breastfeeding, their infants were more likely to be exclusively breastfed; ORs=2.11 (95% CI=1.17-3.81) and 4.92 (95% CI=2.43-9.98) respectively. During group discussions, some men expressed their interests in breastfeeding. Although they were aware of the advantages of breastfeeding to the healthy development of infants, their actual assistance to infant feeding was limited. It is a traditional norm that men should not involve with infant feeding because it is a 'women's job'. Men could share with the workload of women in the field but not housework. In addition, after replanting and harvesting periods, men in Quang Xuong district often worked outside the village for additional incomes.

> 'I think breastfeeding is good because it is natural. But I let my wife decide how to feed the baby. She should know how to take care of children. I know nothing about it.'
>
> A men aged 31

Traditionally grandmothers often serve as a carer for both mother and infant in the first few months after delivery. It is cultural expectation that mothers should learn from the experience of grandmothers. However, grandmothers may not necessarily have an adequate knowledge of infant feeding, leading to potentially conflicting situations. The following case is an illustration:

> 'I am not comfortable with the way my mother-in-law gave porridge to my daughter. But it is very hard to talk with her about it, as she would be very disappointed. Old people often turn a small issue into a complicated matter. My husband will not be satisfied about it.'
>
> A women aged 27

4.6.3.7 Influence of providers

In the initial survey, for women who delivered at a health setting, 79.6% reported being encouraged by health workers to breastfeed their infants immediately after birth and 76.1% feeding on demand during their stay in the hospital or CHCs. However, only 22% of the respondents reported receiving information, education and communication materials on breastfeeding, 37.6% receiving demonstrations on breastfeeding, and 7.5% having individual consultation or discussion with health workers about breastfeeding.

In group discussions with health workers, we learned that a national breastfeeding programme had been implemented in Quang Xuong district in recent years. However, very little training on breastfeeding counselling was given to health workers. Moreover, supportive supervision from the district hospital to commune health workers on this issue was limited. Therefore, despite the dissemination of the national guidelines on breastfeeding, many health workers either lacked the basic knowledge and skills of breastfeeding counselling, or were not confident of providing coaching in the daily practice. The following response from a commune midwife is an example:

> 'You can tell mothers not to use formula or other complementary food. They listen but will not follow your advice. Babies are hungry and they need to eat. We asked them to stimulate the nipple for better milk, but they said it did not work'.
>
> A commune midwife, aged 46

Some health workers seemed not convinced of the values of breastfeeding. In a commune health centre, we saw a woman bottle-feeding her baby just two days after delivery. All health workers knew it but did not do anything to convince the woman to exclusively breastfeed the infant. When asked the reasons for their behaviours, an assistant doctor said:

'Of course, we all understand that mother's milk is the best. But giving baby formula is not too bad. It is nutritious and a lot better than rice solution.'

A commune assistant doctor, aged 42

In case the delivery was attended by a Traditional Birth Attendant (TBA), again very few women received information on infant feeding from this provider (26%). However, information provided by TBAs was often insufficient or inadequate.

'She [a TBA] told me to give rice solution or porridge for my baby after three months so that the child would have strong bones'.

A woman aged 34

In Quang Xuong district, Women Union was very active and had its network in each village. Women Union activists worked closely with CHCs to outreach mothers for health education including breastfeeding. Unfortunately, they did not possess sufficient knowledge and skills on breastfeeding counselling.

'Women Union was very active in health education to the community. However, they do not know how to do it properly. At our monthly meeting, we sometimes teach them how to talk to women about breastfeeding. But they still insist doing it in their own way rather than following our advice.'

A commune doctor aged 38

4.6.3.8 Influence of commercial advertisement

The use of formula and/or cow milk for infants increased from 6.4% at week 1 to 13.7% at week 24. Most of the women in the study were exposed to commercial advertisement of formula through the mass media (98%). Commercial advertisement of formula often portrayed an urban wealthy couple with a healthy and clever baby, and that formula could provide the super nutrients for proper infant development that really influenced women's perception and practice of breastfeeding.

'We gave the milk [formula] to our baby once a day instead of giving him vitamins and other tonics. Breastfeeding is good but giving him some 'catalyst' for growth is also good.'

A mother aged 28

4.6.3.9 Economic related factors

Poverty is another significant determinant of breastfeeding. Logistic regression analysis indicated that when a family had sufficient food during the year, it is likely for the baby to be exclusively breast-fed (OR=4.16, 95%CI=1.02-9.83). Nevertheless in the qualitative survey, some women expressed their wish to have formula but were unable to purchase such products due to financial constraints, as a package of formula could cost 10% of the family's monthly income.

> 'Since the baby was born, we bought only three packages of 'Dielac' [a locally produced formula]. We could not afford more, as the milk was so expensive.'
>
> A mother aged 28

4.6.4 Discussion

Our study found a higher exclusive breastfeeding rate compared to previous reports. The Demographic and Health Survey conducted in 2002 showed that only 31% of infants less than two months of age were exclusively breastfed. After five months of age, no child was exclusively breastfed (6). Another report indicated a national exclusive breastfeeding rate of 29.2% within the first four months postpartum (2). However, the different sampling and data collection procedures adopted could produce such variations in exclusive breastfeeding rates. For instance, the Demographic and Health Survey used a very small sample of children across seven regions of Vietnam (6), therefore, the resulting rate might not be representative for the rural Northern Central region of Vietnam.

This study found women's education could positively influence breastfeeding patterns, unlike previous studies (24, 25). It may be argued that the decline of the initiation and duration of breastfeeding is an inevitable consequence of modernization. Higher education is associated with the adoption of modern ideas often leading to the abandonment of traditional practice including breastfeeding (25).

In the literature, maternal education was found to be an effective way to improve exclusive breastfeeding (26, 27). Unfortunately, in Quang Xuong district, maternal education on breastfeeding was rather limited. In addition, health workers often focused on safe childbirth rather than breastfeeding infants.

To maintain exclusive breastfeeding practice, women seemed to need further motivation from health workers. However, health workers generally lacked the necessary knowledge and skills for practical counselling. Similar results were reported in other countries (11, 28, 29). Studies indicated that lack of administrative support and supervision of health worker's performance could cause the failure of a breastfeeding programme (30).

In a collective society such as Vietnam, breastfeeding behaviours are likely to be affected by neighbours and friends. Evidence from this study suggested that civil societies in rural areas such as the Women Union could provide substantial lactation support for women through their outreach activities. However, the collaboration between these societies and local health clinics should be strengthened in order to deliver an effective programme for rural mothers.

Living in the Confucian culture, women are dependent on men and senior members of the family. If their husband/partner and parents-in-law give physical and emotional support, the women will be motivated and confident to maintain exclusive breastfeeding. In developing countries where the position of women in the society is relatively low, the role of spouse and relatives in encouraging breastfeeding is crucial (12, 31, 32).

Poverty is an important factor to encourage breastfeeding amongst rural women (14). Although financial constraints may prevent women from buying formula, infants are likely to be fed with home cooked food at the early stage. Another consequence is that women have to return to work shortly after delivery. Despite the economic reforms that have taken place in recent years, most women in rural Vietnam are not covered by any social insurance schemes and do not have maternal leave. The pressure to earn a living to support the family makes exclusive breastfeeding difficult in practice.

Marketing of the commercial formula industry virtually had affected not only the breastfeeding behaviours of women, but also the medical practice of health workers. Although the implementation of the national code on milk-substituted products was

enforced in recent years, there is still a need to monitor and evaluate formula promotion activities in the mass media and medical practice settings.

Using a combination of qualitative and quantitative methods, this study examined factors influencing breastfeeding patterns in rural Vietnam. To improve the breastfeeding situation, the implementation of national guidelines on breastfeeding should be further reinforced by providing appropriate training and supportive supervision to health workers. There is also a need for effective programmes to support the working mothers to exclusively breastfeed their infants through the community mobilization.

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4.7 Contraception within six-month postpartum in rural Vietnam: implications on family planning and maternity services

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Abstract

Objectives: This longitudinal study documents contraception practice and factors influencing contraception decision within the first six months postpartum, amongst women residing in the rural Northern Central region of Vietnam.

Methods: A sample of 463 rural women who gave birth during August-October 2002 were recruited and interviewed at one, 16 and 24 weeks postpartum.

Results: The proportion of contraceptive users at weeks 16 and 24 were 17% and 43% respectively. At week 24, of contraceptive users, 57% used IUD, 25% used condom, and 14% used traditional methods. Logistic regression analysis found age, sufficient knowledge on contraceptives and husband/partner opinion can significantly affect the contraception decision.

Conclusions: In order to improve the situation, health authorities should be encouraged to provide counselling on postpartum contraceptive methods during ante- and postnatal care visits. Health education on family planning and breastfeeding should also involve the husband/partner group taking into account local socio-cultural features.

Key words: Contraception, family planning, longitudinal study, postpartum, Vietnam

4.7.1 Introduction

In Vietnam, contraceptives are provided through two delivery networks: the Maternal and Child Health of the Ministry of Health, and through the population collaborator of the Committee of Population, Family, and Children. In the former network, contraceptives are mainly provided at peripheral clinics that are supervised by a family planning unit based at a district health service. Both clinical and non-clinical contraceptives are available. For the latter, non-clinical contraceptives are supplied by the population collaborator (field worker) network established in each village. The government subsidizes contraceptive services provided by both public delivery networks. In addition, certain types of contraceptives are also obtainable through private clinics and retail pharmacies.

Fertility has rapidly declined within the past 15 years. According to the 2002 Demographic and Health Survey [1], the total fertility rate has dropped dramatically from 3.9 in 1985-1989 to 1.9 in 1998-2002. Parallel with the fertility decline, the rate of menstrual regulation and induced termination of unwanted pregnancies has been high. During the late 1990s, the total abortion rate was estimated to be 2.5 per woman [2]. This abortion figure suggests a weakness in the current delivery system for family planning and maternity services [3]. Although the contraception prevalence rate is relatively high, 79% of married couples use some contraceptive methods and 57% use modern methods, but 2/3 of pregnancy terminations occur among women who use contraceptives at the time of becoming pregnant. Indeed, one quarter of the births are unplanned [1].

The postpartum period is a critical time in terms of health and psychological conditions. Health workers are important sources of information on postpartum contraception. However, for women in developing countries, postpartum care frequently does not include counselling on family planning. Consequently, the risk of poorly timed or unwanted pregnancies will increase if women are unable to obtain effective contraception [4]. To deal with this problem, an immediate postpartum strategy by adopting contraceptive methods within 40-45 days after delivery has been suggested. The rationale is that delaying the initiation of contraception increases the risk of unwanted pregnancy, because it is impossible to accurately predict when a

woman will be fecund [5]. Others have promoted a reliance on natural lactational protection against pregnancy for as long as possible, and the introduction of proper contraception when the pregnancy risk becomes substantial [6, 7].

Contraception related topics in the context of Vietnam have been addressed previously [8-11]. However, the issue of contraceptive use during the postpartum period has not been investigated, especially in rural areas of Vietnam where the total fertility rate is 40% and induced abortion rate 30% higher than their urban counterparts. The unmet need for family planning services is 42% higher in rural Vietnam, while the exposure to family planning information via the media is also relatively low [1]. Therefore, the aim of this longitudinal study is to document contraception practice and to explore factors affecting contraceptive use within the first six months postpartum for women residing in the rural Northern Central region of Vietnam.

4.7.2 Methods

4.7.2.1 Location

The study was conducted in Quang Xuong District, Thanh Hoa Province, located 150 km south of the capital Hanoi. Quang Xuong District is divided into 41 communes, of which nine are coastal and 32 lowland, with a total population of 240,000. The population growth rate for Quang Xuong was 1.6% from the national census of 1999. The district is representative of Northern Central Vietnam according to demographic and health indicators [12].

4.7.2.2 Study design and interview

A sample of 463 rural women who gave birth during August-October 2002 in Quang Xuong district enrolled and participated in this study. Research assistants recruited delivery cases from district and commune health authorities. Subjects were consecutively selected until sufficient power was attained for statistical analysis. For women delivered in the District Hospital (DH), research assistants interviewed them in the hospital during their postpartum period. For those who delivered either at a commune health centre (CHC) or at home attended by a traditional birth attendant, interviews were conducted at the CHC or at their home. The initial survey took place

within the first week of delivery. The purpose was to examine their intention to use contraceptives and to gather what post-delivery information on family planning they had been given. Subjects were then followed up at home during weeks 16 and 24 to determine what method they were using then and the influences that had affected their choice. They were fully informed about the study objectives and the interview procedure. Written consent was obtained from each participant. Moreover, all subjects were free to terminate the interview or withdraw from the study without any negative consequences. The protocol followed the ethical principles of the Helsinki Declaration [13] and the National Health and Medical Research Council of Australia [14], and was approved by the local health authorities and the Human Research Ethics Committee of Curtin University.

4.7.2.3 Statistical analysis

Data were analysed using the SPSS package version 11. In addition to descriptive statistics and univariate tests to compare contraception patterns, logistic regression analysis was undertaken to explore factors affecting the decision on contraceptive use during week 16 and week 24 postpartum.

4.7.3 Results

4.7.3.1 Demographic characteristics

The initial survey included 463 participants; only 3 and 4 women missed the follow-up interviews at week 16 and week 24 respectively. Of the respondents, 181 (39%) delivered at DH, 229 (50%) at CHC, and 53 (11%) at home. The average age of the cohort was 26.4 years (SD=4.97) at the baseline survey. About 47% of them had family income between VND 500,000 and 1,000,000, and about 40% between VND 200,000 and 500,000 (US$1 ≈ VND 15,500). It should be remarked that the average monthly income for a labourer was VND 445,000 in the North Central region of Vietnam [15]. More than half of them finished secondary school, 8% finished high school and 6% had a diploma or university degree, while 18% did not complete primary school or had never attended school. About 63% of the respondents identified themselves as farmers.

4.7.3.2 Desire for more children

The initial survey showed that 55% of the subjects desired to have more children in the future of which 31% in the next 3-4 years, 66% in the next five years or later, and only 3% within the next 1-2 years. Regarding the resumption of sexual activity, 65% of the women had already had sexual intercourse with their partner by week 16 and 87% by week 24.

4.7.3.3 Intention and actual contraceptive use

Table 4.7.1 presents contraceptive methods recommended by providers post delivery, intention of participants to use contraceptives at week one, and actual use of contraceptive methods at weeks 16 and 24. Over 75% of the women were given information on contraceptive methods. The recommendations were mainly targeted at IUD (94%) while other methods were paid less attention. Within one week after delivery, 96% of the cohort indicated that they would consider contraception in the future, about 90% of them planning to use IUD. However, by week 16, only 17% of them actually practised contraception of whom 39% used an IUD, 31% condom, and 25% traditional methods (mainly withdrawal and periodic abstinence). By week 24, 43% of the cohort used contraceptives of whom 57% used IUD, 25% condom, and 14% traditional methods. In both follow-up surveys, relatively few women adopted a combination of methods. No woman reported using the lactation amenorrhoea method, while the proportion of users of the pill or injectables was minimal. Moreover, it is interesting to note that 14% of women who had contraception at week 16 discontinued the use of contraceptive methods at week 24. A significant change in the pattern of usage between the follow-up surveys was also observed: condom use had decreased but IUD had become more popular for the subjects.

4.7.3.4 Reasons for contraception

With regard to the reasons for contraception, 30% of the contraceptive users 'followed the advice of health workers', 16% stated that 'the contraceptive method is available at local health setting', while others expressed their preference as: 'like the method' (15%), 'husband/partner like the method' (17%), and 'both husband and wife like the method' (12%). For those who did not have contraception, their main reasons were 'not aware of the need during postpartum period' (57%), 'concern about the quality of breast milk and/or mother's health' (9%), 'unavailability of

contraceptive methods' (7%), 'feel embarrassed to ask for contraceptives' (5%), and 'close relatives did not agree' (4%).

Table 4.7.1: Post-delivery advice by providers, intention and actual use of contraceptives

	Provider's recommendation on contraception post delivery	**Intention to use contraceptives at week 1**	**Contraceptive use at week 16**	**Contraceptive use at week 24**
Obtained contraception information (N (%))	337 (76.4)	-	-	-
Intention to use (N (%))	-	444 (95.8)	-	-
Contraceptive users (N (%))	-	-	80 (17.4)	199 (43.4)
Contraceptive methods (%) [a]				
IUD	93.5	87.5	38.8	57.3
Condom	26.1	4.2	31.3	25.1
Sterilization	6.5	2.2	2.5	1.0
Injectables	0.3	0.2	-	-
Pill	16.6	0.9	1.3	-
Traditional methods	7.3	3.8	24.7	13.6
Other methods	1.7	1.1	2.5	3.0

[a] multiple responses

4.7.3.5 Contraceptive supply and cost

At week 24, 72% of users received their contraceptives from a CHC, 22% from private pharmacies, 5% from population collaborators, and about 1% of women

obtained contraceptives from the DH. For women who gave birth at a health setting, 80% reported receiving information on contraception post delivery, however only 64.3% of them fully understood the health worker's advice. About 60% of modern contraceptive users had to pay, with the mean cost for an IUD being VND 7,444 (SD=3,811) and VND 3,720 (SD=2,812) for condom per month. These costs were considered cheap when compared to the cost of one kilogram of rice at VND 3,000-6,000 in the local market.

4.7.3.6 Health problems

Amongst modern contraceptive users at week 24, only 6% of them reported experiencing any contraceptive related health problems, which were mainly vaginal discharge, lower abdominal pain and back pain.

4.7.3.7 Involvement of close relatives

We found that 88% of the respondents had ever discussed contraception with their husband/partner post-delivery, and only 4% reported objection to contraception by their close relatives. Regarding the choice of contraceptive method, 87% of women made the decision jointly with husband/partner, compared to 12% by herself and 2% by the mother or mother-in-law. The majority of the husbands/partners preferred IUD (82%) than other contraceptive methods.

4.7.3.8 Factors influencing contraceptive use

Logistic regression analysis was applied to determine factors affecting the contraception decision at weeks 16 and 24, results of which are presented separately in Table 4.7.2 and Table 4.7.3. At week 16, the significant variables selected by the backward stepwise procedure were age, sufficient family planning knowledge, and discussion with husband/partner, with respective odds ratio 0.33, 4.67 and 3.09. The first two factors similarly influenced the use of contraceptives at week 24, with odds ratios 0.44 and 4.35, respectively. During the postpartum period, younger women were more likely to use contraceptives than older women. Mothers who acquired sufficient knowledge from health providers about contraceptive methods and family planning tended to practise contraception than those without. Compared to women who did not discuss the issue with their spouse, opinion from husband/partner could

also impact on the contraception decision. Finally, two-way interaction terms were not significant in the logistic regression models.

4.7.4 Discussion

The proportion of respondents who used contraception was low within 6 months postpartum. Our study on the breastfeeding pattern found a very low exclusive breastfeeding rate of 44% by week 16, and nearly all respondents stopped this practice by week 24 [16]. As most women resumed sexual activities soon after week 16, the delay of contraception would place them at a high risk of unwanted pregnancy.

Table 4.7.2: Logistic regression results of factors influencing contraception decision at week 16

(N = 397 [a])

Variable	Did not use contraceptives		Use contraceptives		Odds ratio (95%CI)
	N[b]	%	N[b]	%	
Age [c]					
< 25	156	41.4	40	51.3	1
≥ 25	221	58.6	38	48.7	0.33 (0.17-0.64)
Sufficient information on contraception [c]					
No	263	71.7	26	33.8	1
Yes	104	28.3	51	66.2	4.67 (2.60-8.39)
Discussion with husband/partner [d]					
No	52	14.2	5	6.4	1
Yes	315	85.8	73	93.6	3.09 (1.12-8.48)

[a] 63 cases excluded due to missing entries

[b] some subjects did not respond to the question

[c] $p < 0.01$

[d] $p < 0.05$

Similar to previous studies in Vietnam [1, 8, 10, 11], IUD was the primary contraceptive method used by the rural women. It appears that instead of providing information on available alternatives, the health providers have focused mainly on IUD. Consequently, women were unable to make an informed choice for their own need [3]. In this study, no woman relied on the lactation amenorrhoea method for contraception, which is not surprising because the method is seldom promoted by health providers and it is not listed in government reports on family planning. In a study in the United Kingdom, Glasier, Logan and McGlew commented that due to lack of training, there was likely a universal belief among midwives that breastfeeding does not prevent pregnancy although the contraceptive effects of breastfeeding is evident [17]. According to WHO, in many countries, counselling on contraception ignores the lactation amenorrhoea method [18].

Table 4.7.3: Logistic regression results of factors influencing contraception decision at week 24

(N =413 [a])

Variable	Did not use contraceptives		Use contraceptives		Odds ratio (95%CI)
	N[b]	%	N[b]	%	
Age [c]					
< 25	109	42.4	87	44.2	1
≥ 25	148	57.6	110	55.8	0.44 (0.23-0.84)
Sufficient information on contraception [c]					
No	198	78	91	46.2	1
Yes	56	22	106	53.8	4.35 (2.81-6.73)

[a] 46 cases excluded due to missing entries

[b] some subjects did not respond to the question

[c] $p < 0.01$

Logistic regression analysis showed that when women were given sufficient information on contraceptive methods, they would be willing to have contraception during the postpartum period. Although advice on contraception was often provided after delivery, the quality of such information appeared to be a matter of concern. Indeed, a large number of women did not fully comprehend the process and procedure involved, or were unaware of the need for postpartum contraception. It has been acknowledged that under the Vietnamese network of maternity service delivery, counselling is rarely provided to the client; even if it is provided, the quality is often poor [3]. To date, counselling has not been formally introduced into the medical education system, and it does not form part of the routine medical practice curriculum in Vietnam.

The prenatal and postpartum periods afford good opportunities to influence contraceptive behaviour since women are in close contact with the health care system during pregnancy and the first months of the baby's life [19]. However, in the current medical practice in Vietnam, information on family planning and postpartum contraception is given to women at follow-up postnatal rather than during antenatal visits. While the rate of antenatal care is relatively high (86%), postnatal care is rarely provided in rural areas [1, 3]. To a large extent this explains why so many respondents were not aware of the need for postpartum contraception.

There have been different views on the effect of information provided to women during prenatal and postnatal visits on the actual contraceptive use. There is evidence that women are more receptive to advice given antenatally [20]. A study conducted in Egypt on the impact of antenatal counselling on couple's knowledge and practice of contraception, follow-up immediately after delivery and three months later, found that counselling sessions did improve a couple's knowledge and practice in the study group [21]. However, Smith et al reported that although women said they found the opportunity to discuss contraception antenatally was useful, it did not make any difference to patterns of contraceptive use postpartum [22].

It has been suggested that postnatal ward is not an appropriate setting to discuss future contraception as women are anxious to establish infant feeding and to learn to care for the new baby [17]. Nevertheless, it is argued that although contraception is probably the last thing on a new mother's mind during the first few days after delivery, leaving the discussion until later in the postpartum period may mean missing the opportunity altogether [22].

Studies indicated the influence of husband/partner on the use of contraceptives of women [23-27]. A study in Mexico [27] found that of 33% women who refused postpartum contraception, the reasons for rejecting contraceptives were related directly to the husband. Mistik et al in a study in Turkey in a rural area reported that 27% of men did not want their wives to use IUD and 32% did not agree with women using contraceptive pills [26]. A study in Iran suggested that husband's level of education were the most significant factors influencing contraceptive use [28]. In fact, involving the husband in family planning counselling sessions led to joint decisions being made and encouraged women's use of contraception [21]. In our study, 87% of the respondents jointly made the decision with their husband/partner and only 12% decided by themselves. Despite the high level of involvement by men in contraception, the contraceptive method mix was still heavily gender-biased towards the female methods. Moreover, very few women reported objections from their close relatives concerning contraceptive use. This result seems contrary to other studies which demonstrated the impact of parental influences on childbirth decisions [29-31].

Some limitations need to be considered in conjunction with the findings. Due to the sensitivity of the research topic and the relatively short period of follow-up, information on the duration of postpartum amenorrhoea as well as the incidence of unwanted pregnancy was not collected. Additionally, although the intervals between the three surveys were rather short, the collected information could be subjected to some recall error, as the women were still in the recovery stage after childbirth.

In view of the observed low rates of exclusive breastfeeding and contraception, we conclude that there is a risk of unwanted pregnancy for rural Vietnamese women within six months postpartum. To improve the situation, health providers should be trained and encouraged to provide counselling on postpartum contraception during

ante- and postnatal care visits, and by adopting more gender-sensitive approaches to service delivery. In addition, health education programmes on family planning and breastfeeding should involve the husband/partner taking into account local socio-cultural features. Finally, health authorities should promote a broader range of contraceptive methods and allow clients to make an informed choice on the method that best meets their needs.

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Chapter 5: Conclusion and Recommendations

5.1. Limitations of the study

There are some limitations that need to be considered when interpreting the findings of the study. Firstly, the subjects were recruited from a rural district of Thanh Hoa Province and therefore they should be representative of the rural North Central region of Vietnam rather than the whole population. In Papers I-III, the study sample was selected from a list compiled from the official reporting system. Although routine reports of the Expanded Programme of Immunization and antenatal care programmes are generally considered complete, selection bias could not be ruled out because there might be some women who delivered at home but were not captured in our list. Secondly, in Papers I-III, quantitative data were collected via self-report of respondents. Such information could incur recall bias, especially with regard to family income and costs of delivery services. On the other hand, in Papers IV-VII, whilst recall bias is expected to be small, frequent contact by local health workers over a six month period, may inevitably influence the pattern of feeding and contraception use among study participants. Thirdly, reliability and validity were tested upon willingness-to-pay and perceived quality instruments, but not for breastfeeding and postpartum contraception. Finally, only cases with complete observations were used in the multivariate statistical analyses. It is expected that the missing data occurred at random and were neither related to the subjects nor the variables under study. Every care had been taken to ensure the correctness of data entry while data screening and periodic cleaning were undertaken to confirm the accuracy of the information recorded.

5.2. Conclusion and recommendations for maternal and child health programmes

Good physical access does not necessarily increase the utilization of maternal services as a consequence of institutional, environment and individual barriers. Improvement in the efficiency of the peripheral health care delivery network requires substantial efforts beyond investment on health care infrastructure. Client-perceived

quality of services and socio-cultural, and economic factors are important determinants of the utilization of maternal services, therefore, these variables should be carefully considered when designing and during implementation of maternal and child health programmes.

To generate a demand for facility-based deliveries, women and men should be sufficiently educated on the need and right for reproductive health through behaviour change communication activities. In addition, maternal services should be provided in a client-oriented manner taking into account social and cultural factors as well as other local features.

The willingness-to-pay instrument is feasible and relatively reliable to measure benefit of delivery alternatives at the primary health care level. Health policy makers, managers and practitioners should be encouraged to apply this instrument to set up appropriate price of maternal services, and improve allocative efficiency of the service delivery network.

Client's perceived quality of services should be included in the assessment of quality of maternal services. The feasibility and reliability of the 20-item scale were confirmed when measuring client-perceived quality of delivery services and its influence on the utilization of maternal services. Health policy makers, managers and practitioners should be encouraged to use this instrument when evaluating maternal health programmes.

The exclusive breastfeeding rates estimated in this study were higher than those of other cross–sectional studies undertaken in the same year. It has been suggested that in cross–sectional studies mothers could recall 'any breastfeeding' rates accurately. However, the timing of the introduction of solid foods appeared to be less accurately recalled which could lead to heaping of responses in cross–sectional studies. Therefore, there is still a need to conduct a well-design survey to accurately estimate the prevalence of breastfeeding at national and regional levels. Reliable information on breastfeeding patterns, in turn, could lead to a more appropriate design and implementation of the national nutrition programme.

Marketing by the commercial infant formula industry affects not only the breastfeeding behaviours of women, but also the medical practice of health workers. Although the National Code on Milk-substituted Products has been enforced in recent years, it is still necessary to monitor and evaluate formula promotion activities in the mass media and medical practice settings to ensure adherence to these codes.

In view of the observed low rates of exclusive breastfeeding and contraception, there is a risk of unwanted pregnancy for women within six months postpartum. To improve the situation, counselling on postpartum contraception should be given to women and men during ante- and postnatal care visits. Furthermore, health authorities should promote a broader range of contraceptive methods and allow clients to make an informed choice on the method that best meets their needs, while adopting a more gender-sensitive approach to service delivery.

In a patriarchal culture such as Vietnam, male participation is crucial for the successful implementation of maternal and child health programmes. As the workload of women in rural areas is heavy during the prenatal and postpartum period, mobilizing the participation of the community and family, especially men to share the workload with women, can play a crucial role in the improvement of childbirth, contraception and breastfeeding practice. Men should thus be treated as key stakeholders in future maternal and child health programmes.

Commune health workers and community activists are important sources of support for women. However, they need to be further trained in terms of inter-personal communication and counselling skills, and be appropriately supervised by district health authorities. Given the low utilization of maternal services at the primary health care level, commune health workers should be encouraged to provide more outreach services to meet client's need.

5.3. Recommendations for further research

In light of the findings of this study, some research topics should be explored further. Firstly, the influence of 'hidden' costs, including opportunity costs, of facility based deliveries on the utilization of services should be carefully examined. Secondly, the

influence of men in the decision making process of women regarding delivery options, contraceptive use, and breastfeeding should be further investigated. Thirdly, the feasibility and reliability of willingness-to-pay and perceived quality of care instruments were demonstrated in the context of rural Vietnam. Nevertheless, studies on the feasibility, reliability and validity of these instruments in other cultural or social contexts are necessary in order to promote wide application of these instruments in practice. Fourthly, in order to capture the trends and behaviour change of breastfeeding and contraception, longitudinal studies beyond 24 weeks should be undertaken. Finally, the role of private health providers including traditional birth attendants in maternal and child health programmes in should be comprehensively investigated, since they are still common in the study population of rural Vietnam.

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Appendices

Appendix 1: Questionnaires used in the thesis

1A: Questionnaire for the survey on maternal services (postpartum women)

ID number: ☐☐☐☐☐

Commune: Commune's code:
Village: Village's code:
Date of interview:
Interviewers:

Part 1: Socio-economic information
1. What is your name:
2. Your mailing address:
3. Sex: Male (1)   Female (2)
4. Age:
5. How many children do you have?
6. Education level
         tertiary level (1)
         graduate diploma (2)
         high school (3)
         secondary school (4)
         primary school (5)
         never to school before (6)
7. What is respondent's reading ability? (check reading ability by asking respondents read a piece of newspaper)
         read with difficulties (1)
         cannot read (2)
         no problem at all with reading (3)
8. What is your main occupation?
9. Do you do any other jobs to earn living outsides farming work?
10. What is income of your family (try best to probe the income per month of the family in VND)
11. Does your family have enough food to eat? If not, how many months do your family lack of food?
12. How much money does your family spend for a month (outsides other family-made products)?
13. Did you spend any money on health care last month? Yes (1)   No (2)
14. If yes, how much did you spend for health care last month (ask if appropriate)
15. What kinds of properties does the family possess? (tick all responses)
         TV (1)
         Radio (2)
         Bicycle (3)

Motorbike (4)
Boat (5)
Fan (6)
16. What is the type of house in which the respondent is living in?
brick wall (1)
mud wall (2)
tiles/pan-tiles (3)
flat-concrete roof (4)
thatched roof (5)
no house at all (6)
17. What is type of floor of the house
mud (1)
ceramics (2)
brick (3)
other (4)
18. Are you living with your parents or separately
With the parents (1)
Separately (2)

Part 2: costs of services
19. When did you deliver your last child?   (Birth date of the child)
What is his/her name
20. Where did you deliver your last child?
Home (1)
CHC (2)
District (3)
Other places (specify) (4)
21. How long does it take from your house to the health facility where you *currently* have medical check-ups?
By distance (km):
By time (hour):

Now please try to recall when you delivered your last child.
22. Did it cost money for transportation to bring you to the health facility and to bring you back home? (if delivered at a health facility only).
If yes, how much was it?
23. How much did you have to pay for the services at the health facility for this case of delivery?
hospitalized costs
drugs
services of health staff
gifts/money for health staff
Meals for mother
cost to keep bicycle/bike
and other costs?
24. Do you have any relatives/friends to take care of you for this case of delivery?
Who are they? (note clearly the relationship with the woman, their profession)
25. How many days (hours) did they spend to help you during childbirth? (note that it is time out of work).

26. What are costs of the carers?
        accommodation
        meals, drinks
        other costs
27. Were you satisfied with the provided services?
        Satisfied   Neutral   Not satisfied

Part 3: Perceptions towards quality of care

We would like to know your opinion on the Commune Health Centre where you are living. We would like to know what you think about the Commune Health Centre and the health staff who work there.

Health Care			
1. In your opinion, is the health staff in the CHC capable of finding out what is wrong with the patients?	very capable	somewhat capable	hardly or not at all capable	No response or do not know
2. In your opinion, are the drugs that the health staff in CHC prescribes…?	The drugs needed	generally the drugs that are needed	Not the drugs that are needed	No response or do not know
3. In your opinion, patients can obtain drugs from this CHC …	Easily	with relative ease	with difficulty	No response or do not know
4. The drugs supplied by this CHC are…	Good	somewhat good	not good	No response or do not know
5. The patients cared for in this CHC…	Recover well	Recover relatively well	Do not recover well	No response or do not know
Health Personnel			
6. In your opinion, the health staff in the CHC examines their patients…	well	Relatively well	not well	No response or do not know
7. In your opinion, the health staff in the CHC monitors their patient's recovery…	well	Relatively well	not well	No response or do not know
8. In your opinion, the health staff in the CHC is … with the patients?	very open	relatively open	not open at all	No response or do not know
9. In your opinion, the health staff in the CHC is … towards the patients?	very compassionate	somewhat compassionate	not compassionate at all	No response or do not know
10. In your opinion, the health staff are … towards the patients	Respectful	somewhat respectful	not respectful at all	No response or do not know
11. In your opinion, the time that the health staff devote to their patients is …	adequate	More or less adequate	Inadequate	No response or do not know
12. In your opinion, the time that the health staff take to explain to women about their health condition is …	adequate	More or less adequate	Inadequate	No response or do not know
13. In your opinion, the people who work in this health facility are …	very honest	generally honest	not very honest	No response or do not know

Health facility				
14. In your opinion, the fees that are charged in this health facility are …	reasonable	more or less reasonable	not reasonable	No response or do not know
15. In your opinion, in this health facility, patients have access to credit …	easily	with relative ease	with difficulty	No response or do not know
16. the distance form your home to the health facility is …	reasonable	more or less reasonable	not reasonable	No response or do not know
17. In your opinion, the number of health staff in this health facility is …	adequate	More or less adequate	Inadequate	No response or do not know
18. In your opinion, the health staff in the health facility are ….to treat women's health problems.	well suited	generally well suited	not well suited	No response or do not know
19. In your opinion, the equipment in the health facility is … for detecting women's health problems.	well suited	generally well suited	not well suited	No response or do not know
20. In your opinion, the waiting rooms, examination rooms and other rooms of the health facility are … for women's health problems.	adequate	More or less adequate	Inadequate	No response or do not know

Part 4: Willingness To Pay

In Quang Xuong, currently there are four options where a woman might give birth. The first is delivery at home with the assistance of a Traditional Birth Attendant (TBA). Second option is delivery at home but assisted by a health staff (either midwife or assistant doctor, currently working or already retired). The third choice is delivery at a CHC with the assistance of health staff. The last option is to deliver the baby in a referral facility, district hospital.

Traditional Birth Attendance

TBA is usually a mature woman who is not formally trained in health care in general and Safe Motherhood in particular. She (seldom it is a man) lives in the village to carries out her daily work as a farmer or seller. Generally speaking, TBAs do not work regularly. However, when a pregnant woman in the village is in the process of labour, she might be invited to help for delivery. She learns skills and experience from other older TBA in the village or from period of time practicing as a TBA. A TBA could deal with normal delivery, but not complicated cases. They often follow traditional practices such as treating difficulties with herbs.

Home based delivery with a trained person's attendance

Some women decide to deliver their baby at home with the attendance of a trained person, generally recognized by the community. This person could be health staff from a CHC (either currently working or already retired). She/he could be also someone who has some health training before (in the army, or at a health related school), but is not practised at a formal health facility now. In many cases, that

person is a private provider. Due to limited conditions and skills, this trained person could deal with normal delivery, but not complicated cases.

CHC based delivery

A CHC is located in a commune where basic health cares are provided for people living in the commune. CHC is a formal health provider at grass-root level under direct supervision of district health service. A CHC should provide ANC and delivery services as well as other health services. Commune health staff is often trained in a medical school. CHC is also equipped with basic instruments. When a woman comes to a CHC for delivery, she will be assisted by a midwife/nurse or an assistant doctors or doctors. CHC staff is responsible for normal delivery as well as other childbirth related care such as ANC. When the case is complicated, the woman will be referred to higher levels by a health staff.

District hospital based delivery

District hospital is the referral health facility for people living in communes or clients could go directly to there themselves. These facilities are always more equipped and staff are better trained compared to a CHC. However, the distance to these facilities is farther than CHC and the costs for the services are more expensive. Also there are more clients in district hospital and you might have to wait for a longer time to have the services.

Above are the 4 different choices for a woman who is giving birth. We would like to ask you some questions:

1. Which type of care do you prefer?

    ☐ Traditional Birth Attendant (TBA)

    ☐ Home based delivery attended by trained health workers

    ☐ CHC based delivery

    ☐ District hospital based delivery

2. One way to measure the value of your option is to ask you the most you would be willing to pay to receive the care (your option) instead of other choices. This is a simple way of measuring how strong you feel about having the care you chose instead of other options. So, imagine that you have to pay. There are no right or wrong answers. The amount you say could be big or small. We are really interested in your view.

So, see the range of money and tell us the maximum amount of money you are willing to pay in order to receive the care you have chosen.

Table 1: The range of choices for willingness-to-pay

10,000	120,000	700,000
20,000	140,000	800,000
30,000	160,000	900,000
40,000	180,000	1,000,000
50,000	200.000	1,100,000
60,000	250,000	1,200,000
70,000	300,000	1,300,000
80,000	400,000	1,400,000
90,000	500,000	1,500,000
100,000	600,000	2,000,000

3. Could you please state below why you are willing to pay such an amount for the care you chose?

Thank you for your collaboration!

1B: Questionnaire for the survey on maternal services (pregnant women and their partners)

ID number: ☐☐☐☐☐

Commune: Commune's code
Village: Village's code
Date of interview:
Interviewers:

Part 1: Socio-economic information
1. What is your name:
2. Your mailing address:
3. Sex: Male (1) Female (2)
4. Age:
5. How many children do you have?
6. Education level:
   - tertiary level (1)
   - graduate diploma (2)
   - high school (3)
   - secondary school (4)
   - primary school (5)
   - never to school before (6)
7. What is respondent's reading ability? (check reading ability by asking respondents read a piece of newspaper)
   - read with difficulties (1)
   - cannot read (2)
   - no problem at all with reading (3)
8. What is your main occupation?
9. Do you do any other jobs to earn living outsides farming work?
10. What is income of your family (try best to probe the income per month of the family in VND)?
11. Does your family have enough food to eat? If not, how many months does your family lack of food?
12. How much money does your family spend for a month (outsides other family-made products)?
13. Did you spend any money on health care last month? Yes (1)   No (2)
14. If yes, how much did you spend for health care last month (ask if appropriate)
15. What kinds of properties does the family possess? (tick all responses)
   - TV (1)
   - Radio (2)
   - Bicycle (3)
   - Motorbike (4)
   - Boat (5)
   - Fan (6)
16. What is the type of house in which the respondent is living in?
   - brick wall (1)

mud wall (2)
tiles/pan-tiles (3)
flat-concrete roof (4)
thatched roof (5)
no house at all (6)

17. What is type of floor of the house
mud (1)
ceramics (2)
brick (3)
other (4)

18. Are you living with your parents or separately
With the parents (1)
Separately (2)

Part 2: costs of services

19. Are you (or your wife) currently pregnant? Yes (1)   No (2)

20. How many weeks of pregnancy?   _____

21. Where did you (or your wife) go for the last antenatal care check-up?
District Hospital (1)
Commune Health Centre (2)
No antenatal care at all (3)
Others (4)

22. How many times have you (or your wife) been for ANC at a health facility?

23. How much do you (or your wife) have to pay for one ANC at a CHC?
Drugs
Costs for ANC check-up
Transportation
Meals due to waiting for a long time
Other costs

24. Do you have any relatives/friends to help (or your wife) you for this ANC?
Yes
No

25. Who are they? (note clearly the relationship with the woman, their profession)

26. How many hours did they spend to help you (or your wife) during ANC? (note that it is time out of work).

27. What are costs of the carers?
accommodation
meals, drinks
other costs

28. How long did you (or your wife) have to wait before the health staff checked you?

29. How long does it take from your house to the health facility where you have ANC check-ups?
By distance (km):
By time (hour):

30. Were you satisfied with the provided services?

| Satisfied | Neutral | Not satisfied |

Part 3: Perceptions towards quality of care

We would like to know your opinion on the Commune Health Centre where you are living. We would like to know what you think about the Commune Health Centre and the health staff who work there.

Health Care				
1. In your opinion, is the health staff in the CHC capable of finding out what is wrong with the patients?	very capable	somewhat capable	hardly or not at all capable	No response or do not know
2. In your opinion, are the drugs that the health staff in CHC prescribe…?	The drugs needed	generally the drugs that are needed	Not the drugs that are needed	No response or do not know
3. In your opinion, patients can obtain drugs from this CHC …	Easily	with relative ease	with difficulty	No response or do not know
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Health Personnel				
6. In your opinion, the health staff in the CHC examines their patients…	well	Relatively well	not well	No response or do not know
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10. In your opinion, the health staff are … towards the patients	Respectful	somewhat respectful	not respectful at all	No response or do not know
11. In your opinion, the time that the health staff devote to their patients is …	adequate	More or less adequate	Inadequate	No response or do not know
12. In your opinion, the time that the health staff take to explain to women about their health condition is …	adequate	More or less adequate	Inadequate	No response or do not know
13. In your opinion, the people who work in this health facility are …	very honest	generally honest	not very honest	No response or do not know
Health facility				
14. In your opinion, the fees that are charged in this health facility are …	reasonable	more or less reasonable	not reasonable	No response or do not know
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….to treat women's health problems.				
19. In your opinion, the equipment in the health facility is … for detecting women's health problems.	well suited	generally well suited	not well suited	No response or do not know
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Part 4: Willingness To Pay

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4. Which type of care do you prefer?

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☐ Home based delivery attended by trained health workers

☐ CHC based delivery

☐ District hospital based delivery

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60,000	250,000	1,200,000
70,000	300,000	1,300,000
80,000	400,000	1,400,000
90,000	500,000	1,500,000
100,000	600,000	2,000,000

6. Could you please state below why you are willing to pay such an amount for the care you chose?

Thank you for your collaboration!

1C: Questionnaire for the breastfeeding initial survey

Identification number: ☐☐☐☐

Name of Health Centre where the baby was delivered ☐☐

(Code: district hospital 1, CHC 2)

Date of interview:

Name of interviewers:

Section 1: Background information

1   What is your name?

        What is your age?

2   What is your partner's name?

        What is your partner's age?

3   What is your address?

4   How is about your baby (ies)

        Name of Baby (ies)

        Gender

        Male

        Female   1

        Birth weight   kgs   2

        Date of Birth

5   What is the highest level of education you have completed?

            Tertiary level   1

            Graduate diploma   2

            High school   3

            Secondary school   4

            Primary school   5

            Never been to school before   6

6   Can you read a piece of paper (check with an article of newspaper)

        Read with difficulties   1

        Cannot read   2

        No problem at all with reading   3

        Reluctant/do not want to read   4

7   Were you employed outside the home or studying for the past 6

months?

Yes, full-time employed	1
Yes, part-time employed	2
Yes, student	3
No	4

8a   What is your occupation?   1

Farmer (go to 8b)	2
Fish-woman	3
Seller	4
Small businesswoman	5
Teachers	6
Other government staff	7
Others (please specify)	8

8b   If she is a farmer ask the following question, otherwise go to question 9

Do you do any other jobs to earn living outsides this work?

Yes	1
No	2

If yes please specify

9   What do you plan to do in the next 3 months?

Will still be home with the baby	1
Work full-time	2
Work part-time	3
Study full-time	4
Undecided	5

10a   What is your partner's occupation?

Farmer (go to 10b)

Fisherman

Seller

Small businesswoman

Teachers

Other government staff

Others (please specify)

10b   If he is a farmer ask the following question, otherwise go to question 11   1

	Do you do any other jobs to earn living outsides farming work?	2
	Yes	
	No	
11	Approximately, what is the monthly income of your family (try best to probe the income per month of the family in VND)?	
	………………………………………………………………	
12a	On average, your family has enough food to eat for the whole year?	
	Yes	1
	No	2
12b	If NO, how many months your family has not enough food to eat during the year?	
13a	How are you living now	
	With my husband's family (extended family)	
	With my parent's family (extended family)	
	With my own family (not in extended family)	
13b	Have you had **help from anyone,** on a daily or almost daily basis for the delivery?	
	No	
	Yes, husband / partner	
	Yes, mother	
	Yes, other family member or in-law	
	Yes, friend/s	
13c	What is your marital status?	
	Never married	1
	Now married	2
	De facto	3
	Divorced or separated	4
	Widowed	5

Section 2: Breastfeeding practices

14	How are you feeding your baby?	
	Breast-feeding only	1
	Bottle-feeding infant formula or milk (go to question 15)	2
	Mainly bottle-feeding (formula) but also breast-feeding	3
	Mainly breast-feeding but 'topping up' with bottle-feeding (formula)	4

Mainly breast-feeding but also feed with sugar liquid	5
Mainly breast-feeding but also feed with fruit	6
Mainly breast-feeding but also feed with porridge	7
Other (please specify)	8

_____

15   If you are giving your baby any bottle-feeds, how many bottles did your baby have yesterday (24 hours)?

Formula (write the brand name of the formula)	1
Other milk (write the brand name of the milk)	2
Sugar liquid	3
Fruit	4
Porridge	5
Others	6

16   If you are only bottle-feeding, did you try to breast-feed your baby?

No (Go to question 18)	1
Yes (Go to question 17)	2

17   If you decided to bottle-feed your baby from the start, what were the reasons for this choice?

(Please circle **any answers** that apply. You can have more than one answer)

Formula is better for the baby	1
Bottle-feeding is easier	2
I don't like breast-feeding	3
I will go back to work soon after the birth	4
Breast-feeding will make my breasts sag	5
The baby's father prefers bottle-feeding	6
Formula is just as good as breast-milk	7
The baby's father can help with bottle-feeding	8
I want to know how much milk baby has at each feed	9
My mother suggested bottle-feeding	10
Friend or relative suggested bottle-feeding	11
Health worker (e.g. , doctor, nurse) suggested bottle-feeding	12
I am breast-feeding	13
Other (please specify) _____	14

18   When did you **first** decide how you were going to feed your new baby?

Before I became pregnant ……………………………	1
Early in my pregnancy …………………………….	2
Late in my pregnancy ……………….…………….	3
During labour …………………………………….	4
After my baby was born …………………………	5

19 Who helped you decide whether you would bottle-feed or breast-feed?

(Please circle **any answers** that apply. You can have more than one answer)

20a Did any member of the hospital staff encourage you to put your baby to the breast right after the birth?

Yes (go to question 20b)	1
No (go to question 21)	2

20b Who encouraged you to put your baby to the breast right after the birth? (Please circle **any answers** that apply) (You can have more than one answer)

Doctor …………………………………………	1
Midwife ………………………………………….	2
Nurse ………………………………………….	3
Other (please specify) _____	4

21 Since delivery of the baby, did any relatives and/or friends visit you and give you some sugar and formula as a gift?

No	1
Yes, sugar	2
Yes, milk	3
Yes, formula	4

22 Have you used any sugar or/and milk for your self or your baby?

For myself	1
For my baby	2
Use for both myself and baby	3
Not use yet	

23 How often are you feeding your baby?

On demand i.e. Whenever baby wants to be fed (e.g. Cries our in hunger)	1
By the clock – about every 2 hours	2
By the clock – about every 3 hours	3
By the clock – about every 4 hours	4

	Other (please explain) _____	5
24	About how long does your baby spend at the breast for a feed?	
	Baby is bottle-feeding	1
	Less than 15 minutes	2
	15 minutes to half an hour	3
	half an hour to an hour	4
	Continuous, over an hour	5
	Other (please specify) _____	6
25	About how many times per day do you feed your baby? (in a 24 hour period)	
26	Have you been encouraged by hospital staff to 'demand feed'?	
	(Demand feeding is whenever the baby wants to feed)?	
	Yes	1
	No	2
27a	Have you been satisfied with the hospital's rules about how often you should feed your baby?	
	Yes (go to question 28)	1
	No	2
27b	Please explain what you don't like about these rules.	
28	In general, do you think you have had enough help and information about feeding your baby from hospital staff?	
	Yes	1
	No	2
	Do not want to comment	3
29	Since you have been in hospital have you received any of the following from hospital staff?	
	Please circle all that you have received. (You can have more than one answer)	
	Pamphlets on breast-feeding baby	1
	Lectures or classes on breast-feeding baby	2
	Demonstrations on how to breast-feed baby	3
	Video (TV) or slide show on how to breast-feed baby	4
	Samples of infant formula	5
	Booklets or other information about infant formula	6
	Individual consultation or discussion with any of the staff about breast-feeding baby	7
	None of the above	

	Other (please specify)	8
		9

30	Does the baby's father have any preference for how you feed your baby?	
	Yes, he prefers bottle-feeding	1
	Yes, he prefers breast-feeding	2
	He doesn't mind how I feed my baby	3
	Never really discussed the matter with him	4
31	Did your mother breast-feed any of her children?	
	Yes	1
	No	2
	Don't know	3
32	Does your mother have any preference for how you feed your baby?	
	Yes, she prefers bottle-feeding	1
	Yes, she prefers breast-feeding	2
	She doesn't mind how I feed my baby	3
	Never really discussed the matter with her	4
33	How have your friends fed their babies?	
	Most of them bottle-fed	1
	Most of them breast-fed	2
	Some breast-fed and some bottle-fed	3
	Friends don't have babies	4
34	For the next few weeks, how do you think you will feed your baby?	
	Continue bottle-feeding	1
	Continue breast-feeding	2
	Continue to combine breast and bottle-feeding	3
	Stop breast-feeding and start bottle feeding	4
	Stop bottle feeding and start breast-feeding	5
	Other (please specify) _____	6
35	When do you plan to give your baby solids?	
	Before 2 months	1
	Between 2 and 3 months	2
	Between 4 and 6 months	3
	Between 7 and 9 months	4
	Between 10 and 12 months	5

	Over 12 months	6
	Other (please specify) _____	7

36 How was your baby delivered?

Vaginal without forceps or suction

Vaginal with forceps or suction

Caesarean

37 What was your baby's <u>first</u> feed?

Formula	1
Breast milk (or colostrum)	2
Cow's milk	3
Glucose water	4
Plain water	5
Other (please specify) _____	6

38a Has your baby had any health problems, either since the birth or as a result of the birth?

Yes (go to question 38b)	1
No (go to question 39)	2

38b What health problems has your baby had?

39 Is this the first child you have given birth to?

Yes (go to question 41, part 3)	1
No (go to question 40)	2

40 If not, please write how many weeks or months each child was breast-fed. **or** please write **bottle-fed** if bottle-fed from birth

Child   Weeks/months of breast-feeding

_____   _____

_____   _____

41 How long after the birth was it before you put your new baby to the breast?

Immediately after birth, cord still attached	1
Within 15 minutes	2
Between 15 and 30 minutes	3
Between 30 minutes and 1 hour	4
Within a few hours	5
The next day	6
Other (please specify) _____	7

42   How long was it before your milk came in?

      Within one day of the birth   1

      The second day of the birth   2

      The third day of the birth   3

      Still waiting for the milk to come in   4

      Other (please specify) _____   5

43   Did any staff member check how your baby's mouth was attached to your breast when you first started feeding?

      No   1

      Yes   2

44   Did any staff member teach you how to position and attach your baby to the breast?

      No   1

      Yes   2

      I didn't need to be taught   3

45   Why did you decide to breast-feed?

(Please circle **any answers** that apply) (You can have more than one answer)

      The baby's father wanted me to breast-feed   1

      Breast milk is better for the baby   2

      Breast-feeding is the right thing to do   3

      Breast-feeding is cheaper   4

      Breast-fed babies are more intelligent   5

      Breast-feeding helps you lose weight   6

      Breast-feeding is fashionable   7

      My mother advised me to breast-feed   8

      Breast-feeding helps prevent allergies   9

      Other people advised me to breast-feed   10

      Breast-feeding is more convenient   11

      Other (please specify) _____   12

46   Have you experienced any of the following since you started breast-feeding?

(Please circle **any answers** that apply) (You can have more than one answer)

      Inverted nipples   1

      Cracked or sore nipples   2

Baby gets too much milk	3
Baby gets milk too fast	4
Takes a long time before milk starts flowing at start of feed	5
Baby too tired to feed	6
Difficulty expressing milk	7
Baby not gaining enough weight	8
Baby has problems sucking	9
Breasts engorged (too full)	10
Baby doesn't wake up for feeds	11
Not enough milk or colostrum for baby	12
Feeling that I'm not doing very well at breast-feeding	13
Other (please specify) _____	14

47   At what age do you plan to stop breast-feeding your baby?

Before baby is 6 weeks old	1
Between 6 weeks and 2 months	2
Between 2 and 3 months	3
Between 4 and 6 months	4
Between 7 and 9 months	5
Between 10 and 12 months	6
Over 12 months	7
Other (please specify) _____	8

48   Are you planning to start giving your baby formula-feeds?

Yes (go to question 49)	1
No (go to question 50)	2

49   At what age do you plan to start giving your baby formula-feeds?

Before baby is 6 weeks old	1
Between 6 weeks and 2 months	2
Between 2 and 3 months	3
Between 4 and 6 months	4
Between 7 and 9 months	5
Between 10 and 12 months	6
Over 12 months	7
Other (please specify) _____	8

50   Have any of the following people supported or encouraged you with breast-feeding?

(Please circle **any answers** that apply) (You can have more than one answer)

Your friends	1
The baby's father	2
Other members of your family	3
Your clinic sister	4
Your doctor	5
Nursing Mother's Association	6
Your mother	7
Your mother-in-law	8
Other (please specify) _____	9

51   When you leave the hospital or health centre, who will/do you contact if you have problems with feeding your infant?

(Please circle **any answers** that apply) (You can have more than one answer)

Doctors at district/provincial hospitals	1
Health workers at Commune Health Centre	2
Village Health Workers	3
Women Union activists	4
Mother/Mother-in-laws	4
Other close relatives	6
Friends	7
Neighbours	8
Others _____	9

For the following questions, there is no right or wrong answer. Please circle the response that you first think of. For example, in question 45, if you feel very confident in breast-feeding, circle 5, if you don't feel confident, circle 1. If you fall somewhere in-between please circle the appropriate number between 1 and 5. If it is too early to tell, please circle 9.

52   How would you rate your confidence in breast-feeding?

Not confident 1   2   3   4   Very confident 5   Too early to tell 9

53   How enjoyable do you find breast-feeding?

Not enjoyable 1   2   3   4   Very enjoyable 5   Too early to tell 9

54   How satisfied are you with your breast-feeding experience?

Not satisfied 1   2   3   4   Very satisfied 5   Too early to tell 9

55   In general, how comfortable do you feel while breast-feeding in front of other people?

Not comfortable 1   2   3   4   Very confident 5   Too early to tell

Section 3: Postpartum contraception

57   Do you want to have more children in the future?

Yes (move to question 58)	1
No (move to question 59)	2

58   When do you want to have the next children?

Next 1-2 years	1
Next 3-4 years	2
Next 5 years or longer	3

59   Did any health staff consult you about Family Planning methods after delivery?

Yes	1
No	2

60   What type of Family Planning methods did they talk to you about?

IUD	1
Condoms	2
Male or female sterilization	3
Injections	4
DMPA	5
Pills	6
Traditional methods	7
Other methods	8

61   How do you understand the information they gave you?

Very understand (1)	understand (2)	average (3)	less understand (4)	Do not understand (5)

62   Who else gave you advice on FP?

Friends	1
Mother	2
Husband	3
Other relatives	4

	Others	5
	No one	6
63	Have you ever discussed with you husband/partner about FP after delivery of the baby	
	Yes	1
	No	2
64	In your plan, what FP method you and your husband will use?	
	IUD	1
	Condoms	2
	Male or female sterilized	3
	Injections	4
	DMPA	5
	Pills	6
	Traditional methods	7
	Other methods	8
	Do not have any ideas yet	9

Thank you for your collaboration!

1D: Questionnaire for the breastfeeding follow-up surveys

Identification number: ☐☐☐☐

Name of Health Centre where the baby was delivered ☐☐

(Code: district hospital 1, CHC 2)

Date of interview:

Name of interviewers:

Section 1: Demographic variables

1   a. What is your name?

           b. What is your partner's name?

           b. What is baby's name?

           c. What is your address?

2   In the last visit, the feeding method I observed is ---------?
Interviewers check and fill before the interview)

Breast-feeding only	1
Bottle-feeding only	2
Combination of breast-feeding and formula/milk bottle-feeding	3
Combination of breast-feeding and feeding with sugar	4
Combination of breast-feeding and feeding with fruit	5
Combination of breast-feeding and feeding with porridge	6
Combination of formula/milk bottle feeding and other products such as sugar, fruit, porridge, etc.	7
Other responses	8

3   How are you living now?

With my husband's family (extended family)	1
With my parent family (extended family)	2
With my own family (not in extended family)	3

4   Have you had help from anyone, on a daily or almost daily basis, since we last spoke (or since you left hospital)?

No	1
Yes, husband / partner	2
Yes, mother	3
Yes, other family member or in-law	4

Yes, friend/s	5

Section 2: Breastfeeding practices

5   How are you feeding your baby?

Breast-feeding only	1
Bottle-feeding only	2
Combination of breast-feeding and formula/milk bottle-feeding	3
Combination of breast-feeding and feeding with sugar	4
Combination of breast-feeding and feeding with fruit	5
Combination of breast-feeding and feeding with porridge	6
Combination of formula/milk bottle feeding and other products such as sugar, fruit, porridge, etc.	7
Other responses	8

If the feeding method is changed, go to question 6. If the feeding method is not changed, go to Question 8

6   Why did you change feeding methods?

A	1
B	2
C	3
D	4

7   Did anyone help you decide to change in feeding practice? If yes, who?

No,	1
Yes, the baby's father	2
Yes, my mother/mother in law	3
Yes, other relatives	4
Yes, friends	5
Yes, commune Health workers	6
Yes, hospital staff	7
Yes, private health workers	8
Yes, other responses	9

8   Are you feeding by the clock or by demand

Demand	1
Clock - ~ 2 hours	2
Clock - ~ 3 hours	3

	Clock - ~ 4 hours	4
	Others	5

9   How many times per day on average do you feed your baby (24 hours) [If given range, average to one decimal place (0 or 5)]

10   How many times, on average would your baby feed between the hours of 10.00 pm and 6.00 am? [If given range, average to one decimal place (0 or 5)]

11   What is the average length of each feed?

	< 15 minutes	1
	≥ 15 minutes but < 30 minutes	2
	≥ 30 minutes but 1 hour	3
	≥ 1 hour	4

12   After you stop feeding, what is the average length of time before ___ wants another feed?

	< 30 minutes	1
	≥ 30 minutes but < 1 hour	2
	≥ 1 hour but < 2 hours	3
	≥ 2 hours but < 3 hours	4
	≥ 3 hours but < 4 hours	5
	≥ 4 hours	6

13   If you are giving your baby any bottle-feeds, how many bottles did your baby have yesterday (24 hours)? [If given range, average to one decimal place (0 or 5)]

	Formula (write the brand name of the formula)	1
	Other milk (write the brand name of the milk)	2
	Sugar liquid	3
	Fruit	4
	Porridge	5
	Others _____	6

14   At what times do you usually give your baby bottle-feeds?

	No particular time	1
	Mainly during the day	2
	Mainly during the night	3
	Late afternoon (around dinner time)	4
	Other responses	5

15   Have you had any difficulties with breast-feeding since I spoke to you last (or you left hospital) so things like problems with

your breasts or with the baby feeding?

Yes	1
No	2

If Yes, go to question 15, if No, go to question 19

16   What difficulties experienced (unprompted, but probe for more than one answer?)

Problems with breasts

Cracked or sore nipples	1
Breasts engorged (too full)	2
Mastitis or breast infection	3
Inverted nipples	4
Breast-feeding is painful	5

Problems with baby feeding

Baby not gaining enough weight	6
Baby has difficulties sucking	7
Baby gets too much milk or too fast	8
Poor 'let-down'	9
Baby refuses to breast-feed	10
Baby too tired to feed i.e. falls asleep at breast	11
Feeling that I'm not doing very well at breast-feeding	12
Not enough milk for baby	13
Other breast-feeding problems	14

17   Have you asked for advice or help from anyone about your breast-feeding problem(s)? If yes, who?

No	1
Yes, commune health workers	2
Yes, hospital health workers	3
Yes, private doctor/nurses	4
Yes, friend/s	5
Yes, mother	6
Yes, other family member	7
Yes, Village Health Workers/Population Collaborators/Women Activist	8

18   In general, do you feel you have had enough help and advice about feeding since you left hospital (or since we last spoke)

Yes – need help and got it	1

No – needed help but not available	2
Haven't needed any help	3

19   If not, what kind of help would you have liked?

20   Have you seen any advertisements for infant formula since we last spoke or since you left hospital?

Yes (Go to 21)	1
No (Go to 22)	2

21   If yes, where did you see the ad?

22   Have you used with any types of infant formula?

Yes (Go to 23)

No (Go to 28)

23   What type of formula? (Don't prompt, unless – 'I don't know')

Meiji	1	O-Lac	11	Gain	21
Lactogen	2	Isocal	12	Power	22
Nestle-NAN or OMEGA	3	Wyeth-SMA or PROMIL	13	Dielac	23
ANLENE	4	ENERCAL Plus	14	Beto-lysine	24
France-BEBE	5	Tulip	15	Ridielac	25
FRISO brands	6	Dumex	16	Bebi	26
F&N full cream	7	NANA	17	Carnation	27
Snow	8	Baby's choice	18	Ando	28
Enfapro	9	Dutch Lady	19	Fado	29
Birch Tree	10	DHA-Japlo	20	Others (please specify the brand name)	30

24   Why did you choose this particular formula? (Do not prompt but probe for more than one answer)

Recommended by hospital staff	1
Recommended by commune health staff	2
Village Health Workers/Population Collaborators/Women Activist	3
Recommended by private doctors/nurses	4
Recommended by Mother	5
Recommended by Friend	6
Recommended by Chemist	7
Recommended by other family members	8
Saw it advertised	9
It was the cheapest	10

Available in trial size	11
Saw it being used in the hospital	12
Used it before	13

25   Have you tried other formulas?

Yes (Go to Question 26)	1
No (Go to Question 28)	2

26   (If other formula has been introduced) What other type of formula?
(Do not prompt unless answers 'I don't know')

Meiji	1	O-Lac	11	Gain	21
Lactogen	2	Isocal	12	Power	22
Nestle-NAN or OMEGA	3	Wyeth-SMA or PROMIL	13	Dielac	23
ANLENE	4	ENERCAL Plus	14	Beto-lysine	24
France-BEBE	5	Tulip	15	Ridielac	25
FRISO brands	6	Dumex	16	Bebi	26
F&N full cream	7	NANA	17	Carnation	27
Snow	8	Baby's choice	18	Ando	28
Enfapro	9	Dutch Lady	19	Fado	29
Birch Tree	10	DHA-Japlo	20	Others (please specify the brand name)	30

27   Why did you try this particular formula?

Recommended by hospital staff	1
Recommended by commune health staff	2
Village Health Workers/Population Collaborators/Women Activist	3
Recommended by private doctors/nurses	4
Recommended by Mother	5
Recommended by Friend	6
Recommended by Chemist	7
Recommended by other family members	8
Saw it advertised	9
It was the cheapest	10
Available in trial size	11
Saw it being used in the hospital	12
Used it before	13

28   Is your baby having anything other than milk or formula?

	Yes (go to question 29)	1
	No (go to question 30)	2

29 (If yes), what is your baby having? (Do not prompt, but probe for more than one answer)

	Boiled water	1
	Rice	2
	Porridge	3
	Fruit juice	4
	Rusks	5
	Infant cereal	6
	Milk-based desserts / yoghurt	7
	Biscuits in a bottle	8
	Fruit gels	9
	Cooked/pureed/mashed fruit (include mashed bananas)	10
	Cooked vegetables	11
	Bread	12
	Protein foods	13
	Biscuits	14
	Fruit	15
	Raw vegetables	16

30 At what age do you plan to first give your baby solids?

	Less than 2 months	1
	Between 2 and 3 months	2
	Between 4 and 6 months	3
	Between 7 and 9 months	4
	Between 10 and 12 months	5
	Over 12 months	6

31 Has your baby experienced any health problems since I spoke to you last (or since leaving hospital)?

	Yes (Go to question 32)	1
	No (Go to question 34)	2

32 If yes, type of problem

	Vomiting	1
	Diarrhoea	2
	Respiratory	3

	Skin – rash, dermatitis, etc.,	4
	Jaundice	5
	Colic	6
	Others	7
33	Did you take your baby to see anyone about this problem? (If yes, who?)	
	No	1
	Yes, Commune Health Centre/Inter-commune clinics	2
	Yes, District/provincial Hospital	3
	Yes, Private practices	4
	Yes, traditional healers	5
	Yes, pharmacist/drug sellers	
34	Since you have been home, how helpful as your husband / partner been in caring for the baby? (Read out answers)	
	Not helpful	1
	Sometimes helpful or tries	2
	Very helpful	3
	Baby's father not around	4
35	How much does your baby weigh? (g)	
36	When was that weight taken? Date: (DD/MM/YY)	
37	How do you feel about your baby's weight change since birth? (Read out options)	
	Satisfied / pleased	1
	A little concerned	2
	Very worried or concerned	3
	Don't know	4
38	How would you describe your baby's temperament? (Open ended)	
	Placid / easy going	1
	Irritable / fussy	2
	Combination	3
	Don't know	4
39	In general, how comfortable would you or do you feel while breastfeeding in a public place such as the village market?	
	1 not comfortable	1
	2	2
	3 average	3

	4	4
	5 very comfortable	5

40   How does the baby's father feel about breast-feeding and bottle-feeding?

	He prefers breast-feeding but will support whatever I do	1
	He prefers bottle-feeding but will support whatever I do	2
	He prefers breast-feeding	3
	He prefers bottle-feeding	4
	He doesn't mind how I feed my baby	5
	Never really discussed the matter with him	6
	Other responses	7

41   At what age do you plan to stop breast-feeding?

	Before 6 weeks	1
	Between 6 weeks and 2 months	2
	Between 2 and 3 months	3
	Between 4 and 6 months	4
	Between 7 and 9 months	5
	Between 9 and 12 months	6
	Over 12 months	7
	When gets teeth	8
	Don't know	9

I'm going to read out a few statements that are related to breast-feeding. Please just answer True, False or Don't Know. It really doesn't matter if you don't know.

42   Feeding more often increases milk supply

	True	1
	False	2
	Don't know	3

43   Babies need to feed more when they are having a growth spurt

	True	1
	False	2
	Don't know	3

44   There are lots of women who need to give their babies formula because they can't make enough milk

	True	1
	False	2
	Don't know	3

45   Birth control pills can reduce milk supply

            True   1

            False   2

            Mini-pill won't but normal pill wills   3

            Don't know   4

46   Getting extra rest and relaxation is necessary to ensure a good milk supply

            True   1

            False   2

            Don't know   3

47   Feeding formula to a one month old baby will not reduce the amount of milk produced by the mother

            True   1

            False   2

            Don't know   3

This section (from question 48 to 56) is used for those who stopped breastfeeding already. If the woman is still breastfeeding, move to question 57).

48   When did you stop breast-feeding

            Date (DD/MM/YY)

49   Why did you decide to stop breast-feeding?

Prolonged breast-feeding reasons		**Insufficient milk / other baby factors**	
Baby old enough to not be breast-fed	1	Can't tell how much infant is drinking	18
Baby weaned itself	2	My milk isn't good enough	19
I've done my bit, given a good start	3	Baby not gaining enough weight	20
Problems with pain		Baby no longer interested in the breast	21
Breast feeding too painful	4	Baby biting nipples	22
Cracked or bleeding nipples	5	Baby prefers a bottle	23
Breast engorgement	6	Baby ready for solids	24
Breast infection / mastitis	7	Baby ill	25
Inverted nipples	8	**Other maternal factors**	
Problems with nursing technique	9	Mother ill	26
Maternal psychological		Use of prescription medication	27
Mother anxious or unsure about breast-feeding	10	**Paternal factors**	
Breast-feeding requires too much motivation	11	Baby's father preferred bottle-feeding	28

Breast-feeding too difficult	12	Baby's father can help with bottle-feeding 29
Breast-feeding too inconvenient	13	
Mother has been under stress	14	
Mother too tired	15	
Dislike breast-feeding	16	
Concern about how breast-feeding will affect your figure	17	

50   Did you ask for advice or help from anyone about your breast-feeding problem(s)?

       If yes, who?

No	1
Yes, hospital staff	2
Yes, commune health staff	3
Yes, Village Health Workers/Population Collaborators/Women Activist	4
Yes, private doctors/nurses	5
Yes, mother	6
Yes, friend	7
Yes, chemist	8
Yes, other family members	9

51   Did you expect to have difficulties with breast-feeding?

Yes	1
No	2

52   Did you plan to stop breast-feeding (when you did)?

Yes	1
No	2

52   If YES, at what age did you plan to stop breast-feeding?

Before 6 weeks	1
Between 6 weeks and 2 months	2
Between 2 and 3 months	3
Between 4 and 6 months	4
Between 7 and 8 months	5
Between 9 and 12 months	6
Over 12 months	7
When gets teeth	8

53   Did anyone advise you to stop breast-feeding?

No		1
Yes, hospital staff		2
Yes, commune health staff		3
Yes, Village Health Workers/Population Collaborators/Women Activist		4
Yes, private doctors/nurses		5
Yes, mother		6
Yes, friend		7
Yes, chemist		8
Yes, other family members		9

54   Would you breast-feed another child if you had another baby

Yes (go to question 55)	1
Yes, if I could (go to question 55)	2
No (go to question 56)	3

55   If yes, why? (Unprompted but probe for more than one)

Better for baby	1
Better for mother	2
More contented baby	3
Natural	4
Close relationship with baby	5
Convenience	6
Enjoyment / satisfaction of mother	7
No particular reason	8

56   If no, why wouldn't breast-feed another child? (Unprompted but probe for more than one)

Inconvenient	1
Lack of enjoyment / satisfaction of mother	2
Tied to the house	3
Embarrassment	4
Too emotionally taxing for mother	5
Formula is just as good	6
Other responses, why wouldn't breast-feed another child	7

Section 3: Postpartum contraception

57   Did you resume sexual intercourse since delivery of your baby

	Yes	1
	No	2

If 'yes', could you tell us when (by week):

58 Are you currently using any Family Planning methods?

No (go to Question 58)	1
Yes (Go to Question 59)	2

59 Why have you not used any Family Planning methods? (Open-ended question)

(Then move to Question 62)

60 What Family Planning methods are you using now?

IUD	1
Condoms	2
Male or female sterilized	3
Injections	4
DMPA	5
Pills (if take pills, identify the name of the pills)	6
Traditional methods	7
Other methods	8

61 Why did you decide to choose this method? (Open-ended question)

62 Are there any other methods you are now using?

IUD	1
Condoms	2
Male or female sterilized	3
Injections	4
DMPA	5
Pills (if take pills, identify the name of the pills)	6
Traditional methods	7
Other methods	8

63 Have you ever experienced with any health problems you might think due to using FP method?

Yes	1
No (move to question 65)	2

64 What are the health problems you experienced?

(Open-ended)

65 From whom do you receive the contraceptive

	Commune Health Centres	1
	District Hospital	2
	Mobile team	3
	Population collaborator networks	4
	Pharmacies	5
	Shops/markets	6
	Other places	7
66	Have you ever discussed with your husband/partners about FP methods to be used after delivery?	
	Yes	1
	No	2
67	What method of FP does your husband/partner prefer	
	IUD	1
	Condoms	2
	Male or female sterilized	3
	Injections	4
	DMPA	5
	Pills (if take pills, identify the name of the pills)	6
	Traditional methods	7
	Other methods	8
68	Who else have you discussed about the FP methods to be used after delivery?	
	Hospital staff	1
	Commune Health Centre Staff	2
	My mother and mother in law	3
	Relatives	4
	Friends	5
69	In your family, who makes decision on the FP method to be applied after delivery?	
	Myself only	1
	My husband/partner only	2
	Myself and my partner decide together	3
	My mother and mother in law	4
	Other people (please specify)	5
70	Do you think that FP methods can affect your milk supply and your child's health?	

	Yes	1
	No	2
71	After delivery of the baby, have you become **pregnant** again?	
	Yes (move to question 72)	1
	No (move to question 78)	2
	Not so sure (move to question 78)	3
72	If pregnant, when did you find you are pregnant?	
73	How did/do you feel about this pregnancy? (open-ended question)	
74	Did you inform your husband	
	Yes (move to question 75)	1
	No (move to question 76)	2
75	How did/does he receive this news? (open-ended question)	
76	Did you inform other people?	
	Yes	1
	No	2
77	How did/do you decide about this pregnancy?	
	Menstrual Regulation	1
	Abortion	2
	Prepare for giving birth again	3
	Do not know yet	4
78	Have you ever experience with vaginal discharge after delivery?	
	No	1
	Yes	2
79	Who have you visited for assistance then?	
	No	1
	Yes, Commune Health Centre/Inter-commune clinics	2
	Yes, District/provincial Hospital	3
	Yes, Private practices	4
	Yes, pharmacist/drug seller	5
	Yes, traditional healers	6
	Yes, relatives/friends	7
80	Did you take any medicines for these cases?	
	No	1
	Yes, say details what medicines you used	2
81	Have you ever experienced any other health problems since last	

visit? What are they?

    No

    Yes, what are they?

82	Who have you visited for assistance then?	
	No	1
	Yes, Commune Health Centre/Inter-commune clinics	2
	Yes, District/provincial Hospital	3
	Yes, Private practices	4
	Yes, traditional healers	5
	Yes, relatives/friends	6
83	Did you take any medicines for these cases?	
	No	1
	Yes, say details what medicines you used	2

Thank you for your collaboration!

Appendix 2: Authors' contribution to the original research papers

	Original Research Papers	Authors' contributions
I	Duong DV, Binns CW, Lee AH (2005) Measuring Preferences for Delivery Services in Rural Vietnam. *Birth* (accepted February 2005).	Duong DV: Project design, data collection, data analysis, and writing of paper Binns CW: Assistance with project design, analysis and editing Lee AH: Assistance with project design, statistical advice, analysis and editing
II	Duong DV, Binns CW, Lee AH, Hipgrave DB (2004) Measuring client-perceived quality of maternity services in rural Vietnam. International *Journal for Quality in Health Care.* 16(6):447-452	Duong DV: Project design, data collection, data analysis, and writing of paper Binns CW: Assistance with project design, analysis and editing Lee AH: Assistance with project design, statistical advice, analysis and editing Hipgrave DB: Assistance with editing
III	Duong DV, Binns CW, Lee AH (2004) Utilization of delivery services at the primary health care level in rural Vietnam. *Social Science and Medicine* 59:2585-2595.	Duong DV: Project design, data collection, data analysis, and writing of paper Binns CW: Assistance with project design, analysis and editing Lee AH: Assistance with project design, statistical advice, analysis and editing
IV	Duong DV, Binns CW, Lee AH (2004) Breastfeeding initiation and exclusive breastfeeding in rural Vietnam. *Public Health Nutrition.* 7(6): 795-799.	Duong DV: Project design, data collection, data analysis, and writing of paper Binns CW: Assistance with project design, analysis and editing Lee AH: Assistance with project design, statistical advice, analysis and editing
V	Duong DV, Lee AH, Binns CW (2005) Introduction of complementary food to infants within the first six months postpartum in rural Vietnam. *Acta Paediatrica.* (Accepted April 2005)	Duong DV: Project design, data collection, data analysis, and writing of paper Lee AH: Assistance with project design, statistical advice, analysis and editing Binns CW: Assistance with project design, analysis and editing
VI	Duong DV, Lee AH, Binns CW (2005) Determinants of breastfeeding within the first six months postpartum in rural Vietnam. *Journal Paediatrics and Child Health* (accepted January 2005).	Duong DV: Project design, data collection, data analysis, and writing of paper Lee AH: Assistance with project design, statistical advice, analysis and editing Binns CW: Assistance with project design, analysis and editing
VII	Duong DV, Lee AH, Binns CW (2005) Contraception within six-month postpartum in rural Vietnam: implications on family planning and maternity services. *European Journal of Contraception and Reproductive Health Care* (accepted March 2005).	Duong DV: Project design, data collection, data analysis, and writing of paper Lee AH: Assistance with project design, statistical advice, analysis and editing Binns CW: Assistance with project design, analysis and editing