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**CHILD HEALTH PROBLEMS
AND USE OF HEALTH
SERVICES IN A RURAL
DISTRICT IN VIETNAM**

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**Karolinska
Institutet**

Stockholm 2011

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Published by Karolinska Institutet. Printed by Universitetservice US- AB

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ISBN 978-91-7457-596-5

*“I never teach my pupils.
I only attempt to provide the conditions in which they can learn”*

Albert Einstein

ABSTRACT

Background: Like many other low and middle income countries, Vietnam has experienced a period of social, economic and epidemiological transition. The health care system has undergone considerable changes, and it is important to follow up their effects, especially among children under 5 years of age.

Aim: The overall aim was to investigate the use of health services and medical drugs in children less than 5 years of age in a rural district in Vietnam, in relation to the country's policy for child health care. In particular, the roles of social and economic background and attitudes to health care services are analyzed.

Methods: The thesis is based on three studies, using both quantitative and qualitative research methods. All the studies were conducted in Bavi District, a Demographic Surveillance Site in rural Vietnam. Study I was a population-based survey of 4,087 children under 5 years of age. Mothers or caretakers were interviewed about illness in their children, and the measures they took with regard to use of health services and use of drugs during the two weeks prior to the survey. Study II was a qualitative study, using in-depth interviews with two drug sellers and three health care providers, and four focus group discussions with mothers of children under 5 years of age. Study III consisted of an analysis of longitudinal data, performed from 2003 to 2007, on health service utilization among children less than 5 years with respiratory illness and/or diarrhea.

Results: Self-treatment and use of private practitioners were the most common measures taken in cases of respiratory symptoms and/or diarrhea, and the measures taken did not vary according to household economic status. Drugs were used in the majority of cases of respiratory illness and/or diarrhea. Antibiotics (72.2%) and analgesics/antipyretics (53.5%) were the most

commonly reported drugs employed. Corticosteroids were used in 11.6% of all cases. There was a significant association between family's economic position and use of corticosteroids, but the associations with regard to other drugs were weaker. There was no significant association between pattern of drug use and type of health service consulted. There was poor awareness of side-effects, antibiotic resistance, and drug efficacy. Factors influencing self-medication were perceptions of the illness in the child, waiting time and convenience, the attitudes of public health medical staff, an insufficient drug supply in public health facilities, and availability of prescribed drugs on the market. The longitudinal analysis of survey data showed a decrease in use of self-treatment and private practitioners, and an increase in use of community health centers and district facilities, during the study period. The most obvious change was between 2004 and 2006, which coincided with the introduction of a new child health insurance.

Conclusions: Self-treatment and use of a private practitioner are common measures taken by parents when a child is sick. Medical drugs, including antibiotics and corticosteroids, are used to a considerable extent. Misuse and misconceptions regarding drugs contribute to irrational drug use. Mothers' knowledge of and attitudes to illness and health care services play an important role in determining the types of actions taken when children fall ill. There were significant shifts in the pattern of use of health care services over time, and the introduction of child health insurance is likely to have played an important role in these shifts.

Key words: health service utilization, child health care, self-treatment, drug use, antibiotics, health insurance.

LIST OF PUBLICATIONS

- I Le Thi Hoan, Nguyen Thi Thu, Peter Allebeck. Self-treatment and use of health services among children under 5 years of age in a rural district in Vietnam. *International Journal of Child Health and Human Development*. 2009; 2: 169-176

- II Le Thi Hoan, Nguyen Thi Kim Chuc, Ellinor Ottosson, Peter Allebeck. Drug use among children under 5 with respiratory illness and/or diarrhoea in a rural district of Vietnam. *Pharmacoepidemiology and Drug Safety* 2009; 18: 448-453

- III Le Thi Hoan, Ellinor Ottosson, Thi Kim Chuc Nguyen, Bao Giang Kim, Peter Allebeck. Drug use and self-medication among children with respiratory illness or diarrhea in a rural district in Vietnam: a qualitative study. *Journal of Multidisciplinary Health Care*. 2011; 4: 329-336

- IV Le Thi Hoan, John F. Stewart, Nguyen Thi Kim Chuc, Peter Allebeck; Changes in use of health services among children in a rural district in Vietnam from 2003 to 2007: effects of Child Health Insurance (Manuscript)

The papers will be referred to by their Roman numerals (I-IV).

CONTENTS

1	Background	7
1.1	The health care system in Vietnam	7
1.2	Health care organization in Vietnam.....	8
1.3	Policy related to child health services in Vietnam.....	9
1.4	Use of health services among children	11
1.5	Child morbidity and mortality	12
1.6	Drug use among children.....	13
1.7	Conceptual framework for the determinants of health services use	14
1.8	Rationale for the studies	15
2	Aims.....	16
2.1	Overall aim.....	16
2.2	Specific aims	16
3	Methods.....	17
3.1	Study setting	17
3.2	Study design	19
3.3	Study sample	20
3.4	Data collection.....	21
3.5	Data analysis.....	23
3.6	Ethical clearance.....	25
4	Results.....	27
4.1	Paper I.....	27
4.2	Paper II.....	27
4.3	Paper III	28
4.4	Paper IV	29
5	Discussion	31
5.1	Pattern of health services use.....	31
5.2	Determinants of health services use	31
5.3	Misuse and misconceptions regarding drug use.....	34
5.4	Strengths and limitations	35
6	Conclusions	38
7	Policy implications.....	39
8	Acknowledgements.....	40
9	References	42

LIST OF ABBREVIATIONS

ARI	Acute Respiratory Infection
CHC	Community Health Center
CHI	Child Health Insurance
FGD	Focus Group Discussion
GSO	General Statistics Office
HCFP	Health Care Fund for the Poor
IDI	In-Depth Interview
MDG	Millennium Development Goal
MOH	Ministry of Health
MOLISA	Ministry of Labour, Invalids and Social Affairs
OR	Odds Ratio
ORS	Oral Rehydration Solution
RI	Respiratory Illness
UNICEF	United Nations Children's Fund
WHO	World Health Organization

1 BACKGROUND

1.1 THE HEALTH CARE SYSTEM IN VIETNAM

Vietnam is a low-income country in south-east Asia, which had a population of about 86 million in 2010 [1]. Vietnam's health system expanded and developed throughout the country after the liberation of 1975. The system, according to the country's goal of equity, is based on a comprehensive primary health care network and free health care to the entire population. However, due to the country's limited resources for health care, the system does not function well. In 1986, the Vietnamese government reformed the economy, moving from a plan-oriented to a market-oriented economic system, which has had a remarkable influence on the health system in Vietnam. In the health sector, a series of policies were initiated by the Council of Ministers in 1989, aiming at reforming the health sector and mobilizing resources for health. These policies included: (1) strengthening the health care system at grassroots level, including providing salaries for community health staff; (2) the introduction of user fees at district, provincial and national levels in the health care system; (3) the legalization of private sector health care; and, (4) decentralizing the pharmaceutical industry, and allowing the sale of drugs on the open market.

The economic reforms have improved the country's economic growth rate, which is now between 5% and 10% per year, and has reduced the proportion of the population under the poverty line. However, some concerns have been expressed that the reforms have negatively affected health outcomes [2, 3]. There is increasing unequal access to health care, which is especially disadvantageous to the poor and people in remote areas [4-7]. A study from Quang Ninh Province in Vietnam has shown that hospital care can be very expensive, and that poor households may have to sell assets and go into debt if they accept hospitalization [8, 9]. This finding is in line with those of earlier studies of Bavi District in Vietnam, which indicate that the poor rely much more on borrowing money to meet their health care needs [10] [11]. The

Vietnamese government has introduced several policies to eliminate financial barriers to access to health care for children.

1.2 HEALTH CARE ORGANIZATION IN VIETNAM

The health care system comprises both a public and a private health sector, of which the public sector plays a key role in providing health care services for the entire population. The public health sector has four levels, which parallel the state administration system: central, provincial, district, and community. District and community levels are also jointly treated as the “basic” level, which provides general health services for the population. Polyclinics, under the control of district health centers, carry out most health activities in each local region, and make up an intermediate level above the community health centers. The Community Health Center (CHC) is the first formal point of contact in the public health care system, and it is intended to provide primary health care services.

The private health sector has grown since the health sector reforms were initiated in 1989. The total number of private facilities rose from 19,386 in 1998 to 35,000 in 2009 [12, 13]. This development has been regarded as increasing the population’s access to health care. However, the services at private health facilities have been considered to be of lower quality than those at public facilities, and the private facilities sometimes operate beyond their permitted capacity [14, 15] .

The pharmaceutical sector has developed rapidly since the health sector reforms. The number of private drugstores/pharmacies increased from 14,182 in 1998 to 21,600 in 2008 [16]. A management system for the sector has been developed, but has not yet been fully implemented. By the end of 2005, a pharmaceutical management system was lacking in six provinces, while twelve

other provinces did not have a drug inspectorate, and five had no center for the quality checking of pharmaceutical products and cosmetics [17].

There is a wide network of drugstores, which increases availability of drugs for the population, but drug quality, drug storage conditions and the rational use of drugs are challenges to the authorities. Drugs, including antibiotics, can be easily obtained from drugstores without a prescription [17]. The expenses of self-medication account for approximately 30% of total household expenditure on health [18]. There is a shortage of trained pharmacists, with an average of only 1.2 university-level pharmacists per 10,000 population, mainly concentrated in large cities [12].

1.3 POLICY RELATED TO CHILD HEALTH SERVICES IN VIETNAM

1.3.1 Free health care for children

According to the Act from 1991 on the Protection, Care and Education of Children in Vietnam, children under 6 years of age are considered vulnerable groups, and should receive attention accordingly. The Act asserts the right of children to health care, and stipulates that health care is free for all children under 6 years of age at public health facilities [19]. Public health facilities are responsible for monitoring, educating and implementing preventive as well as curative activities for children. Also, the Act on the Protection of Population Health, from 1989, points to the rights of children to receive immunization, treatment, and other preventive and curative services. Reportedly, in accordance with the law, there have been improvements in children's rights in relation to preventive health service indicators, such as immunization coverage, birth attendance by trained staff, etc. For example, the coverage of full immunization of children less than 1 year of age was 93.3% in 2003, and 93.9% in 2008 [20, 21].

In principle, curative care is free for all children under 6 years of age. However, this does not apply if a child does not seek care at a public health facility. In addition, it has been difficult to implement the law in reality due to

a lack of resources. To deal with this limitation, the government, in 2005, determined to make an allocation within the government budget to provide free-of-charge health services for children. It is therefore interesting to analyze changes in health care utilization over the time period considered in this thesis.

1.3.2 Health care for the poor

In the Vietnamese public health sector, there are two types of exemptions from user charges: (1) to provide free-of-charge health services for individuals suffering from certain disorders, such as tuberculosis and leprosy, and for children under 6 years old; (2) to subsidize the fees of certain groups of people, such as the poor, as classified by local authorities according to the national benchmark of poverty [22, 23].

In 1994, the government promulgated a decree on user fees, in which there is a provision for free-of-charge health services for the poor. There are several mechanisms for delivering this policy in the different Vietnamese provinces, with varied financing sources – such as from the government budget (health insurance cards for the poor; free health care services cards, so-called T8 cards), from revenues on user fees, and from local budgets. It is difficult to implement the policy in reality due to a shortage of funds, especially in the disadvantaged areas. In 1995, 21.6% of patients in the whole country were exempted from user fees, but most of those were in the larger cities with better resources [24].

To deal with this limitation, the government decided in 2002 to establish in each province a Health Care Fund for the Poor (HCFP), which is a financing source for free-of-charge health services for the poor. The government budget at central level covers at least 75% of the HCFP, while local government budgets and other donors provide the remainder.

Eligible for funding from the HCFPs are: (1) members of poor households; (2) residents of the poorest communes; and (3) ethnic people living in Vietnam's Central Highland. The HCFPs are expected to reduce health care seeking on the part of the poor, including children in poor families [25, 26]

1.4 USE OF HEALTH SERVICES AMONG CHILDREN

Improving maternal and child health is one of the Millennium Development Goals (MDGs) that requires great effort on the part of many countries, including Vietnam. Child health is a priority of health programs all over the world. However, each year, 6.6 million young children die before their fifth birthday, from causes that are largely avoidable. Universal access to health care for mothers and children is one of the recommendations for making progress in improving their health [27].

Studies in several countries indicate that a decision on the part of a parent/caregiver to seek treatment for a sick child is influenced by several factors: disease severity or type of illness, household economic status, having insurance, access factors, such as distance, education of mothers/caregivers, and sex of the child [28-33].

Studies of health care utilization in Vietnam have shown that a significant proportion of illness is handled by self-treatment [10, 34] [9, 35-37]. The rate varies from 32% to 42%, according to a sentinel study in different geographic areas in Vietnam [36]. According to the National Health Survey, self-treatment occurs in 73% of cases of illness [38]. A study from Quang Ninh Province showed that disease severity, convenience, cost, and degree of payment flexibility were influential in the decisions on health care of households [8]. However, understanding of patterns and determinants of use of health services for children is still limited. For example, there is a need for better knowledge

of parental behaviors in cases of illness in children, and of the role played by social and economic factors in the family.

1.5 CHILD MORBIDITY AND MORTALITY

Most deaths among children under 5 years of age are due to neonatal disorders, acute respiratory infections, diarrhea, malaria, measles and HIV/AIDS [39-41] (Figure 1). Diarrheal diseases and acute respiratory infections are the two leading communicable-disease killers in all regions. In south-east Asia, diarrhea and respiratory illnesses, such as pneumonia, each accounted for 12% of under-five mortality. There are about 1.8 million deaths due to diarrhea every year, 90% of which are of children under 5 years of age [42].

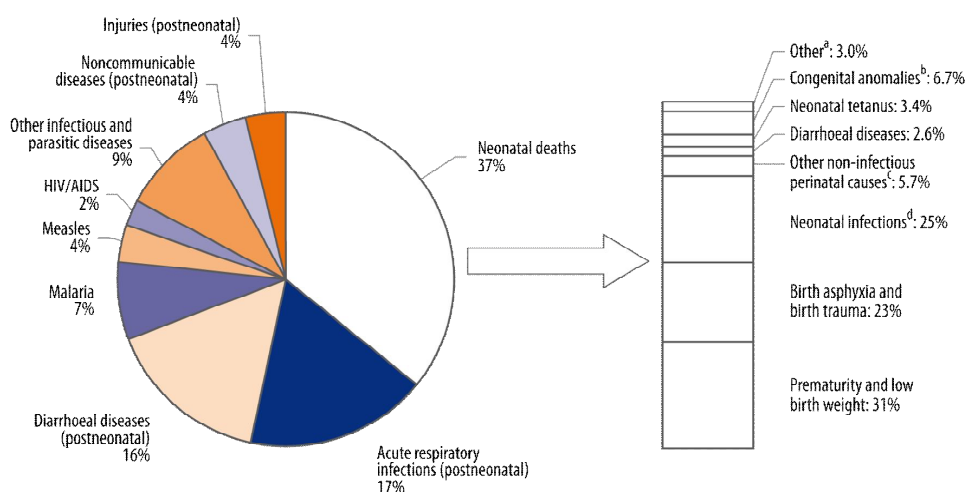


Figure 1: Causes of death among children aged under 5 years.

Source: World Health Organization. *The global burden of diseases 2004, updated 2008.*

According to statistics from Vietnam’s Ministry of Health (MOH), the under-five mortality rate declined from 58‰ in 1990 to 25‰ in 2009 [21]. By 2015, Vietnam may achieve the fourth Millennium Development Goal (MDG4), provided that the pace of reduction in the under-five mortality rate is maintained [43]. However, children under 5 make up 6.7% of the Vietnamese

population, which means that there are approximately 6 million of these children; accordingly, the number of children who die each year is high.

Acute Respiratory Infection (ARI) and diarrheal disease remain the main causes of child morbidity and mortality in Vietnam [17, 44]. Vietnam's National Health Survey has shown that the proportions of children who had ARI and diarrhea during the past 4 weeks were 19% and 5.8%, respectively [38].

In this thesis, I have selected respiratory illness and diarrhea as tracer conditions for studying health behaviors and the use of health services when children fall ill.

1.6 DRUG USE AMONG CHILDREN

The problem of irrational drug use has been highlighted in many countries, including Vietnam [45-56]. The use of antibiotics may contribute to the emergence and spread of bacterial resistance in the population [57-59]. Despite this, antibiotics are often misused in many countries, particularly for cold and upper respiratory tract symptoms, which are self-limiting and mostly caused by viruses [49, 52, 60]. In Vietnam, a high proportion of illnesses are self-treated, and self-treatment includes the administration of antibiotics [61, 62]. Children are particularly prone to a high rate of infections with antibiotic-resistant pathogens [63]. Therefore, analyses of the pattern of drug use and its determinants are important to understand practices in the population and to develop measures for preventing antibiotic resistance and promoting rational use.

1.7 CONCEPTUAL FRAMEWORK FOR THE DETERMINANTS OF HEALTH SERVICES USE

The model illustrated below (Figure2), has been developed by Ronald Andersen [64] and is often used for analyzing the factors associated with the use of health services [65, 66].

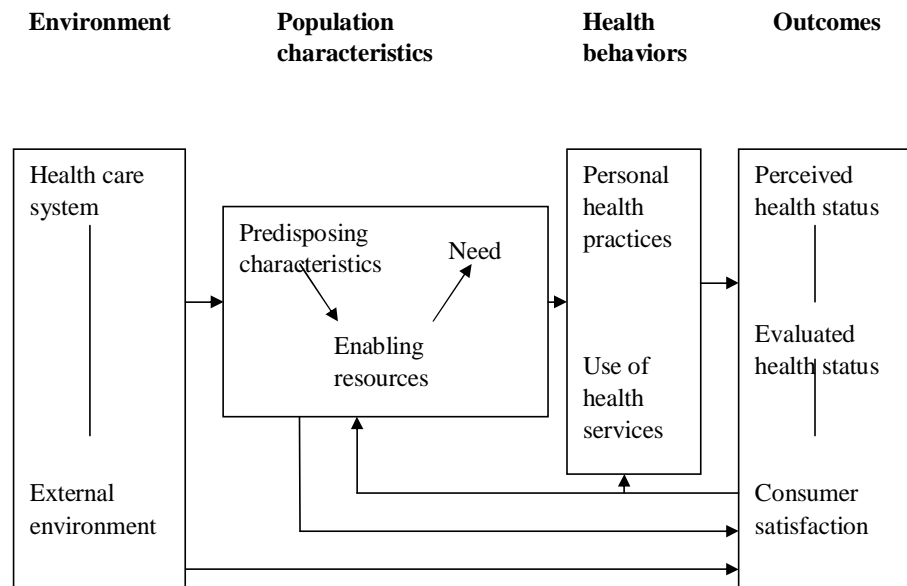


Figure 2: Behavioral model for health services use.

The model categorizes the determinants of health services use on two major dimensions: health system characteristics and population characteristics. Population characteristics are characterized by predisposition to the use of services, enabling factors and need for care. Predisposing factors include demographic factors, such as sex and age, and social structure, as measured by education, occupation and ethnicity. Need describes essentially the health status of an individual that results in health care seeking. Enabling resources are those that enable an individual to use health care services, and are classically divided into economic factors, health insurance and regular sources of care, although Phillips and others have suggested that patient factors, such as the convenience of obtaining care and previous use of services, should be

included [64, 66, 67]. In this thesis, I have considered several of these determinants of health services use and drug use.

1.8 RATIONALE FOR THE STUDIES

Like many other low and middle income countries, Vietnam has experienced a period of social, economic, and epidemiological transition. Also, the health care system has undergone considerable changes; it is important to follow up their effects, especially among children under 5 years of age, who constitute a vulnerable group.

While efforts are being made to develop services and increase quality of care, it is important to monitor access to care and understand people's health care behaviors and uses of various health care measures.

A child health insurance (CHI) policy has been introduced in Vietnam to protect people from the financial risks occasioned by health care costs. It is important to follow up the effects of this particular policy for future health care policy and planning.

The pattern of drug use in children is a global public health problem, since the irrational use of antibiotics increases resistance, which may make certain medical conditions impossible to treat. Further, irrational drug use constitutes a waste of public and private resources in an already constrained economic situation. It is important to understand the factors that determine drug use in order to take appropriate actions.

2 AIMS

2.1 OVERALL AIM

The overall aim of the studies in this thesis was to investigate the use of health services and drugs in children less than five years of age in a rural district in Vietnam, in relation to the policy for child health care in the country. In particular, the role of social and economic background and attitudes to health care services were analyzed.

2.2 SPECIFIC AIMS

1. To analyze the pattern of use of health services and its determinants among children less than 5 years of age with respiratory illnesses and/or diarrhea (I, IV).
2. To describe the pattern of drug use for children with respiratory illnesses and/or diarrhea and the associations between that pattern and various socio-economic factors and the use of health services (II).
3. To explore the knowledge, attitudes and behaviors of parents in their use of drugs for respiratory illness or diarrhea among children under 5 years of age, and to understand the factors influencing parents' self-medication for their children (III).
4. To investigate the changes in use of health services over a 5-year period among children in a rural district in Vietnam in relation to the introduction of child health insurance (IV).

3 METHODS

3.1 STUDY SETTING

This study was conducted within the frame of the Epidemiological Field Laboratory, located in Bavi District in Vietnam. The FilaBavi sample was established in 1999, with the aim of monitoring changes in health status and the function of the health system. Since Bavi District consists of various geographical regions that are considered typical of Vietnam, the district was selected for the field laboratory.

Bavi was a district in Hatay Province during the time of this study. It is in the north of Vietnam, located 60 km west of Hanoi Center. The district covers an area of 410 km², and includes lowland, highland, island, and mountainous areas (Figure 3). Its total population at the time of establishment of Filabavi was about 240,000, and its people are mainly of the Kinh ethnic group (91%). Agricultural production and livestock breeding are the main economic activities of the district's population (81%) [68]

3.2 STUDY DESIGN

This study is founded in both qualitative and quantitative research. The relationships between research questions, individual studies, sample sizes and methods are presented in Table 1.

Table 1: Research questions and summary of study samples and methods.

Study	Study design	Sample size	Research questions	Papers
I	Cross-sectional study	4,087 children under 5 years of age	What is the pattern of use of health services, and what are its determinants among children under 5 years of age?	I
			What is the pattern of drug use for RI and diarrhea in children under 5 years of age, and what are the associated factors?	II
II	Qualitative study	Five in-depth interviews Four focus group discussions	What are the knowledge, attitudes and practices of parents in their use of drugs for RI and diarrhea in children under 5 years of age, and what is their perception of self-medication for children?	III
III	Longitudinal study (5-year period; 20 surveys and 3 re-censuses)	Approximately 4,000 children each year.	Have there been changes in the use of health services in children under 5 years of age? Does Child Health Insurance have an effect on the pattern of health services use?	IV

3.3 STUDY SAMPLE

The FilaBavi sample was selected randomly, and covered all different geographical regions in the district. The sampling unit was the village; at the onset of the study, there were 67 out of 352 clusters in the sample, comprising in total about 51,024 inhabitants in 11,089 households (Figure 4).

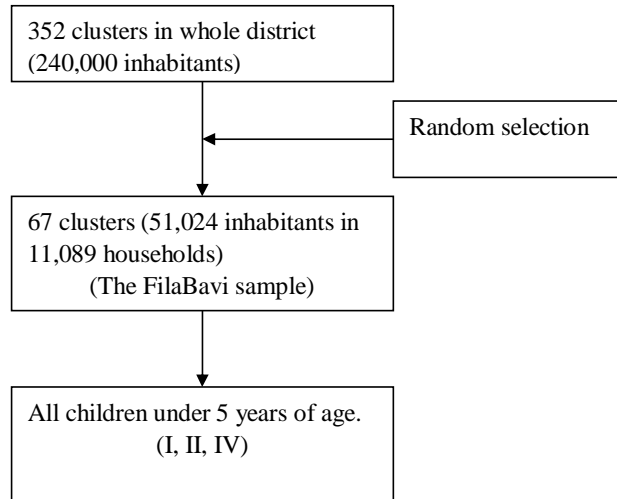


Figure 4: Sampling diagram for the quantitative research.

Study I: Sub-study of RI and diarrhea (Paper I and Paper II)

All children (4,087) under 5 years of age in October 2004 in the FilaBavi sample were included in the study.

Study II: Qualitative research (Paper III)

Five in-depth interviews with health care providers in both the public and private sectors in Bavi District were conducted; the interviewees comprised two drug sellers and three medical practitioners. Four focus group discussions (FGDs) were held with mothers of children under 5 years of age. Two of the FGDs involved better-off mothers, the other two poor mothers.

Study III: Longitudinal study (Paper IV)

All children under 5 years of age during the period 2003 to 2007 were included in the study, a total of 7,715 children.

3.4 DATA COLLECTION

3.4.1 General design of the FilaBavi surveys

The FilaBavi study base consists of a baseline survey in 1999 and further re-censuses every two years. Regular surveys of demographic data and health conditions are conducted four times a year. The baseline survey and re-censuses give information about housing status, income, expenditure, land ownership, valuable items, age, sex, marital status, ethnicity, religion, education and occupation. The quarterly surveys give data on births, deaths, migration, marital status, pregnancy, illness symptoms, and use of health services during the last 4 weeks prior to interview. Self-reported illness were recorded when it resulted in restriction of normal activities for at least one day or a stay in bed.

Within the FilaBavi surveillance site, surveyors are responsible for collecting field data in household interviews. They all have at least 12 years of education or equivalent, and have received special training in carrying out field interviews. One supervisor with some form of medical training is responsible for seven surveyors in order to check the validity and consistency of the interviewing.

The data for this thesis were collected both before and after the introduction of the new Child Health Insurance (CHI).

3.4.2 Study I: Sub-study of RI and diarrhea (Paper I and Paper II)

Socio-demographic data for this study, such as on mother's education, mother's occupation and household economic status, were extracted from the

FilaBavi database. A structured questionnaire was added to collect information on acute respiratory symptoms and diarrhea in children under 5 years of age, and the use of health services during two weeks prior to the survey among actual cases. Mothers/caregivers were asked about illness events, symptoms during illness episodes, use of health services among ill children, reasons for choice of health service, and use of drugs for their child. Data collection time was from October to December 2004.

3.4.3 Study II: Qualitative Study (Paper III)

The interview guidelines were developed and discussed among the authors and research assistants. The focus group discussions (FGDs) were held either in a communal assembly room in the local village or in one of the participants' houses if it was sufficiently large. The author and two research assistants served as facilitator and note-takers in the FGDs and in-depth interviews (IDIs). Each FGD and IDI lasted about one and a half hours, and followed semi-structured interview guidelines that focused on the attitudes and behaviors of mothers with regard to drug use and self-medication. Data collection time was from October to December 2006.

3.4.4 Study III: (Paper IV)

For Paper IV we used FilaBavi information over the 5-year period from 2003 to 2007, which comprised of 20 regular surveys and 3 re-censuses in 2003, 2005 and 2007. Table 2 shows the time periods of data collection for the surveys and re-censuses.

Table 2. Times of data collection.

Year	Jan-March	April-June	Jul-Sep	Oct-Dec
2003	F	F	F	F
		R		
2004	F	F	F	F
2005	F	F	F	F
		R		
2006	F	F	F	F
2007	F	F	F	F
		R		

F: regular/follow-up survey; R: re-census.

3.5 DATA ANALYSIS

3.5.1 Measures

Socio-economic variables

Household economic status was classified into five groups according to a previously validated wealth index: rich, better-off, average, moderately poor, and poor. [69]. The index was calculated on the basis of housing conditions, household assets, expenditure and income.

Parental education was classified into three levels based on highest grade completed: primary, secondary, or high school. Because there were very few illiterate parents, these cases were placed into the primary school group.

Parental occupation was classified into three groups: farmers, employees of government or big manufacturers, and others.

Variables measuring health services use

The use of health services was classified into self-treatment, and seeking health care at private health facility, at traditional healer, at community health center, at district facility, and at provincial or national hospital (6 categories in total).

Self-treatment was defined as having taken “modern” drugs or traditional herbs without medical consultation, either by using drugs that were kept at home or by buying them from a drugstore.

Use of district facilities was defined as seeking care at either a district hospital or a polyclinic.

Illness variables

Cases of respiratory illness (in Paper I) were defined as a child having cough and fever symptoms.

Cases of respiratory illness (in Paper II) were defined as a child having at least a cough symptom.

Cases of diarrhea were defined as a child with loose stool at least 3 times per day.

Because there were few diarrheal cases with reported blood in the stool, these cases were excluded from the analysis in Paper II.

Time period variable

The dummy variable for the introduction of CHI at the beginning of 2005 was coded as 0 for before that date, and as 1 for after.

3.5.2 Statistical analyses

Use of health services was measured by visits to health care providers and use of self-treatment (I, II, IV). Logistic regression was used to calculate odds

ratios for health services use in different socio-economic groups (II). A χ^2 test was applied in Paper II to compare differences in use of particular drugs between socio-economic groups. A random-effect logistic regression model was used in Paper IV to assess the association between determinants of use of health services, including time of introduction of CHI, and reported use of various types of health services, taking into account the within-individual correlation over time.

In this setting, in an ordinary logistic and random-effect logistic model, the dependent variable is the choice of a particular type of health service versus all other possible health-service choices. All the potential explanatory variables that emerged from the statistical differences detected in the descriptive analysis were included in the original model, but we report only on variables that showed a significant difference or were of great concern. Cases of non-use of any health service were excluded from the model.

3.5.3 Qualitative study (Paper III)

Manifest content analysis was used for the FGDs and IDIs. The researchers listened to the tapes and read the transcripts to get an overview of key contents. Meaning units reflecting the same content were identified, abstracted, and then allocated a code. The codes were grouped into categories and abstracted into themes [70].

3.6 ETHICAL CLEARANCE

The study and data collection procedures in FilaBavi were approved by the Research Ethics Committees of Hanoi Medical University and Umeå University, Sweden. The study was approved by local authorities in Bavi District.

The verbal consent of all participants was sought prior to the FGDs or IDIs. The studies were explained, and queries were addressed. Study participants

were informed that their participation was voluntary, and that they were free to withdraw from the study at any time. They were specifically asked permission to allow their sessions to be recorded, and were informed that records were used solely for research purposes.

4 RESULTS

4.1 PAPER I

Out of 4,087 children, 1,415 had had an episode of respiratory infection and/or diarrhea. In most cases, some forms of health care were sought. The most common uses of health services were self-treatment and visit to a private practitioner, followed by visit to a community health center and use of a hospital. Measures reported (actions taken) were 54.5% self-treatment, 31.4% use of private practitioner, 8.8% use of community health center, and 5.3% use of hospital (see Figure 1 in Paper I). This pattern was observed in all household economic groups (see Figure 2 in Paper I). Logistic regression modeling showed that there were no significant associations between the socio-economic and illness-condition factors and the use of health services. The most common reasons given for the use of health services were previous experience of dealing with a similar condition and convenience.

4.2 PAPER II

Out of 4,087 children, 1,836 had at least a cough symptom and/or diarrhea during the two weeks before the interview; drugs were used for 1,823 of the ill children, which accounted for 99.3% of all cases. Antibiotics (72.2%) and analgesics/antipyretics (53.5%) were the drugs most commonly reported. A high use of antibiotics was reported for all types of illnesses, and there were cases of non-indication of antibiotics use. Corticosteroids were used in 11.6% of all cases. Among children with diarrhea, ORS was used in 9.7% of cases, while anti-diarrhea drugs were used in 36.1% (see Table 1 in Paper II). Among children who had used antibiotics, the average number of types of antibiotics per child was 1.35 (95% CI: 1.32-1.39).

There was a significant association between the family's economic condition and use of corticosteroids, but associations were weaker regarding other drugs. Children from better-off and rich households used less corticosteroids and cough & cold preparations than the poor group (Table 3).

There was no significant association between pattern of drug use and type of health service consulted (see Table 4 in Paper II).

Table 3: Adjusted odds ratios by illness categories (with 95% confidence intervals in brackets) for some determinants of the use of certain drugs.

	Antibiotics	Analgesics/ Antipyretics	Cough & cold preparations	Corticosteroids
Mother's education				
Primary school or below	1	1	1	1
Secondary school	1.51(1.13;2.00)	0.99(0.76;1.31)	0.93(0.68;1.28)	0.83(0.56;1.23)
High school or above	1.26(0.89;1.79)	0.90(0.64;1.25)	0.50(0.50;1.10)	0.46(0.26;0.80)
Mother's occupation				
Employee	1	1	1	1
Farmer	1.31(0.85;2.00)	1.21(0.80;1.80)	1.13(0.70;1.83)	3.45(1.24;9.55)
Others	1.13(0.68;9.90)	0.98(0.61;1.56)	0.69(0.38;1.24)	4.04(1.37;11.87)
Household economic groups				
Poor	1	1	1	1
Near poor	0.71(0.52;1.00)	1.38(1.04;1.83)	1.20(0.88;1.62)	1.02(0.70;1.5)
Average	0.68(0.51;0.94)	1.20(0.91;1.57)	0.74(0.54;1.01)	0.63(0.41;0.95)
Better-off	0.66(0.47;0.93)	0.96(0.70;1.31)	0.53(0.36;0.79)	0.46(0.27;0.79)
Rich	0.87(0.61;1.27)	1.03(0.74;1.43)	0.56(0.37;0.84)	0.45(0.25;0.79)

4.3 PAPER III

The informants reported considerable use of different drugs, including a broad spectrum of antibiotics and corticosteroids, for children who had had an episode of respiratory illness. Various combinations of antibiotics, cough & cold preparations and antipyretics/analgesics, such as paracetamol, were mentioned during the FGDs and IDIs as commonly used drugs for RI. Prednisolon and dexamethazon, corticosteroids for systemic use, seemed to be a common choice of mothers in the case of RI.

Also, the FGDs revealed that various types of antibiotics were often used in cases of diarrhea. The antibiotic Biseptol, a combination of sulfamethoxazol and trimethoprim, seemed to be a commonly used drug for diarrhea. The use of oral rehydration solution (ORS) was mentioned by health care providers, but rarely by mothers.

The administration of drugs, including antibiotics, for two or three days, until the child was relieved of symptoms, was reported by mothers and also mentioned in the IDIs. The use of flexible doses, self-adjusted, was reported during the FGDs.

The mothers had vague awareness of side-effects, antibiotic resistance, and drug efficacy. They were not aware of possible adverse effects of the drugs, or of the problem of antibiotic resistance.

Mothers reported that reasons for self-medicating their child were minor illness, waiting time and convenience, the attitudes of public health medical staff, insufficient drug supply in public health facilities, and availability of prescribed drugs on the market.

4.4 PAPER IV

The study included all children under the age of 5 in FilaBavi during the period 2003-2007, a total of 7,715 children. Among these children, 24,930 episodes of RI and/or diarrhea were reported. There was a decrease in the use of self-treatment and of private practitioners and an increase in the use of the CHCs and district services during the study period. There was a remarkable change between 2004 and 2006, during which the use of self-treatment and private practitioners decreased from 53% in 2004 to 42% by 2006, while the proportion of children using CHCs or district facilities increased from 17% to 33%. These trends were observed in all socio-economic groups (Figure 5).

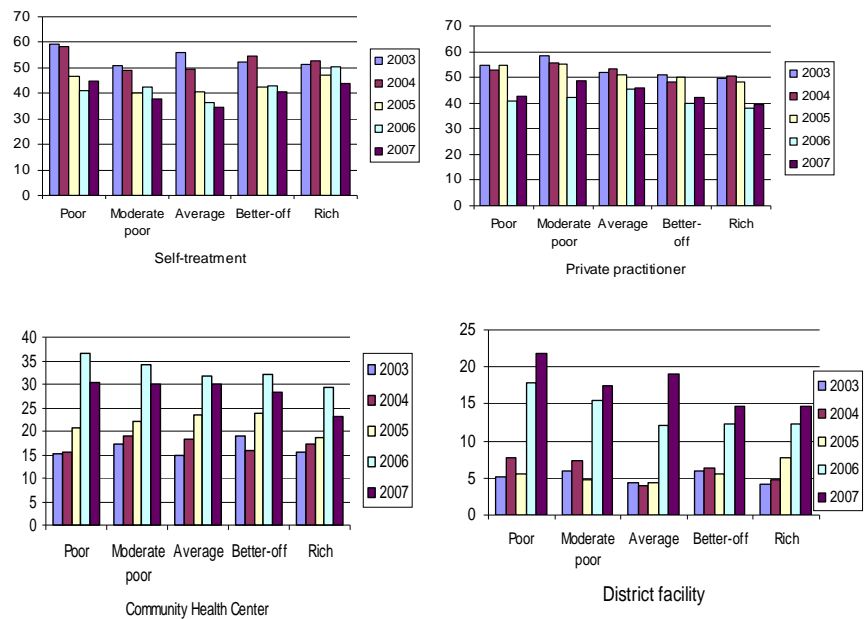


Figure 5: Changes in use of health services by household economic groups and time period.

The random-effect logistic models, adjusted for other socio-economic and geographical factors, showed that there were significant changes in the pattern of health services use between the time before and after the introduction of CHI in 2005 (see Table 2 in Paper IV).

Sex of the child, mother's education and mother's occupation were associated with the use of health services. The study also shows that household economic status was not significantly associated with the use of health services. Children in better-off households were likely to use health services just as much as those in poorer households (see Table 2 in Paper IV).

5 DISCUSSION

5.1 PATTERN OF HEALTH SERVICES USE

Self-treatment and the use of private health services were the most common measures taken by parents when their child fell ill, followed by use of CHCs and district facilities. The high proportion of self-treatment is in line with other studies in Vietnam and in other settings [9, 71-75]. Certain minor health problems may not require any special care, and are appropriate for self-treatment. However, as shown in papers II and III, there was considerable misuse of drugs, which may indicate that self-treatment is likely to give rise to irrational drug use, and could be a risky form of health care.

Although there was a decrease in the use of private practitioners over the study period, this service remained the dominant source of health care for children. The private sector provides substantial services for the population, as it has been observed in other studies [37, 76-78]. Accordingly, close collaboration between the public and private sectors may be needed to improve the quality of health services for children.

5.2 DETERMINANTS OF HEALTH SERVICES USE

5.2.1 Child Health Insurance (CHI)

Our study indicates that the CHI policy significantly influenced the pattern of health services use during the study period. Even after other potential socio-economic determinants of health services use were adjusted for, significant changes in the pattern of use were observed after the introduction of CHI in 2005. The use of CHCs and district facilities increased remarkably, while the use of self-treatment and private practitioners decreased. These tendencies differ from those found by Trivedi and colleagues, who indicate that the use of self-treatment was increasing, albeit between 1993 and 1998 [79]. The difference in findings may be due to a different time period and object of study.

Our results are consistent with the findings of other studies in Vietnam, which show that the introduction of the Health Care Fund for the Poor and Voluntary Health Insurance increased the use of public health services by the people insured [80-82]. And, the positive effects of health insurance on the use of health services have been observed in other settings [83-86]. In this respect, the CHI policy is meeting its objective of increasing the use of public health services for children.

Over the study period, there was a shift away from self-treatment and the use of private practitioners to the use of CHCs and district facilities. The negative effects of health insurance on self-treatment and private health care have been observed in other studies [82, 87]. Since self-treatment has been regarded as a risky form of health care, and given that the quality of private health services is lower than in public health facilities, at least in rural areas, this shift may be of benefit to children in Vietnam [88]. However, such substitution may require adequate planning and resource allocation for the demand induced for public services to be met.

5.2.2 Attitudes of mothers/caregivers towards health care services

We found that previous experiences of dealing with illness and convenience were the most common reasons for choosing a particular health service. Factors influencing self-medication were perception of illness, waiting time and convenience, the attitudes of public health medical staff, insufficient drug supply in public facilities, and the availability of prescription drugs on the market. Recent study in Vietnam shows that attitudes of medical staff resulted in reluctance of use of public health facilities among ethnic minority caregivers [89]. These findings are consistent with the findings of studies conducted in other settings [90-94].

Perception of illness can influence recognition of the need to seek care, but other influencing factors may be related to the interaction between the health care system and patients. Perception of the health care services is an important factor when mothers make a decision over whether they should use health

services that are provided continuously [95]. In this respect, the health care system in any particular area may fail to meet its goal of improving responsiveness.

5.2.3 Social position

Household economic status has been found to be a determinant of the use of health services for children in many studies [75, 96-98], but this was not observed in the current study. The divergence in findings may be due to specific characteristics of child health care in the area concerned.

The pattern of use of health services for children did not vary markedly between household economic groups, but differed significantly in relation to sex of the child, mother's education and mother's occupation.

Parents were less likely to seek care at district facilities for girls than they were for boys. This tendency has not been previously observed in Vietnam, but it is evident in other countries [28, 31, 32, 99]. In Vietnam, the situation should be monitored continuously in order to prevent gender-based inequity in health care.

There were significant differences in the use of private practitioners and CHCs according to mother's educational level. Mothers who had a high-school or higher education were less likely to use private practitioners, but more likely to use local CHCs for their children, compared with those who had a primary or lower educational level. Children of mothers who were employees were more likely to use district facilities than those whose mothers were farmers. It has been shown in Vietnam that people with a higher education tend to use health care provider more than those with a lower education [37]. Our results are in line with studies in other settings, which show that parents' occupation and education are determinants of the use of health services for children [33, 98, 100, 101].

5.3 MISUSE AND MISCONCEPTIONS REGARDING DRUG USE

The study shows that there were considerable problems of misuse and misconceptions regarding drug use for children in the study area. Antibiotics were used commonly for respiratory illness and/or diarrhea in children, and there were cases of non-recommended use of antibiotics. It is well-known that viruses are responsible for the majority of cases of diarrhea and RI, which argues for the non-use of antibiotics in these cases [60, 102, 103].

Antibiotics and other drugs were used in varying doses, and often for shorter periods than appropriate. Misuse of antibiotics and other drugs has previously been observed in both Vietnam and other settings [52, 104-111]. The situation may contribute to a high degree of antibiotic resistance in the area [104, 112].

The use of oral rehydration solution was rather low in cases of diarrhea among children, while anti-diarrheal drugs were used to a greater extent. The inappropriate case management of diarrhea has been observed in many other low and middle income countries [113].

We found that there was systemic use of corticosteroids in many cases of RI and/or diarrhea. Unjustified use of corticosteroids has been found in previous studies conducted in Vietnam [61]. Corticosteroids have known side-effects, and can be regarded as harmful to children. In this study, we cannot give the reasons for high use, but there seems to be a perception in society that symptoms can be alleviated rapidly with corticosteroids, and the drugs are cheap and very easily obtainable.

Mothers' insufficient knowledge concerning the effectiveness of drugs was highlighted in papers II and III and in other settings [114-117]. The education and occupation of mothers and household economic circumstances were all

associated with the use of drugs. These findings are in line with studies in other settings, which show that knowledgeable parents have lower rates of use, and particularly irrational use, of antibiotics [118-120]. Accordingly, interventions to improve awareness regarding drug use on the part of mothers, especially those from the poor households, are essential to reduce the irrational use of drugs in the area.

We found that there was no difference in pattern of drug use according to the type of use of health services. This raises the question of quality of health services in the area, where it is likely that parents seek care and use remedies from a variety of sources. Thus, there is the wider societal and general educational issue of guiding people and families in their choices in relation to health problems. It has been found that cultural and economic factors influence the use of drugs [121]. The system of drug dispensing is also important. Studies in Vietnam have found that all kinds of drugs can be purchased without a prescription in drug stores [54, 61].

The lack of knowledge and misconceptions in this regard should be addressed by all stakeholders in local health and social services, including health care professionals.

5.4 STRENGTHS AND LIMITATIONS

The thesis is based on both quantitative and qualitative research, which enables triangulation of findings from the different studies.

The quantitative studies were population-based with randomly selected samples, and carried out on a Demographic Surveillance Site, which provided for good data collection and study management. The surveys had a very high response rate, which minimizes the risk of bias. The FilaBavi sample can be regarded as representative for Bavi District, and produces results that may be

generalizable to the rural population of Vietnam. Accordingly, our findings can be treated as applying to Bavi District, and also theoretically to other rural areas in Vietnam.

For Paper IV, longitudinal data were analyzed which allowed control for unobserved individual specific effects, and thus resulted in better estimations. In addition, the changes in the proportions of health services use over time were estimated using longitudinal data sets, which can hardly be estimated purely cross-sectionally.

The studies are based on self-reported illness, drug use and health services use, and the validity and reliability of the data can be questioned. However, quality was assured by using surveyors who collect data routinely in FilaBavi; they were trained throughout the data collections, and there was a supervision system that helped maintain validity and reliability. In addition, a two-week recall period was applied in the studies reported in papers I and II, which is the recommended period for studies of acute illness in the field.

The socio-economic data used for the studies were extracted from three censuses, which were conducted at two-year intervals. Therefore, the studies may not account for possible temporary or sudden changes in socio-economic status. However, changeability on the variables used in the studies, such as ethnicity, sex, educational level and occupation, can be considered low in a Vietnamese context.

Data on household health expenditure for children were not available, so the effects of the CHI policy in this respect were not assessed.

The qualitative study included informants from a variety of sources, including mothers, doctors and drug sellers, with interests in both the public and private

sectors, and at different levels. The trustworthiness of the findings was enhanced by triangulation from different information sources, and also by combining FGDs and IDIs. The results of the qualitative study may not be regarded as generalizable to the whole area, but they can indicate problems and add to knowledge on drug use and self-medication for children in the country, and also in other low and middle income countries.

6 CONCLUSIONS

The key conclusions of this thesis are:

Self-treatment and the use of private practitioners are the most common measures taken by parents when their children get sick, followed by using community health centers and district health facilities. This was found to apply over time, regardless of household economic status.

There have been significant increases in the use of public health services at basic level, while self-treatment and the use of private practitioners decreased after the introduction of child health insurance. The child health insurance policy is likely to meet its objective of increasing the use of public health facilities at basic level.

Other socio-demographic factors, such as gender, mother's education and mother's occupation are factors associated with health services use.

There are major problems of misuse and misconceptions regarding drug use, including the administration of antibiotics to children. Household economy was found to be associated with the use of drugs for children, but there are no significant differences in drug use according to the type of health service used.

Mothers' knowledge and attitudes to illness and health care services played an important role in determining the types of actions taken when children fall ill.

7 POLICY IMPLICATIONS

Collaboration between the private and the public sector is needed in order to improve health, especially child health.

Health services should be more accessible and responsive to the needs of the population. Adequate planning and resource allocation are required for health care to meet the demand for services. Communication between health care providers, especially public health providers, and patients should be improved.

Health services use in families in different socio-economic positions should be monitored continuously in order to prevent inequity in health care, especially gender-based inequity in Vietnam.

A comprehensive intervention program to promote rational drug use for children, which combines education, communication and regulation, should be implemented in the area. The program should target all stakeholders, including mothers, doctors, drug sellers, and the authorities; mothers who have a lower educational level and economic status should be prioritized. The management of prescription drugs should be strengthened.

8 ACKNOWLEDGEMENTS

The studies in this thesis are part of the collaboration between Karolinska Institutet and Hanoi Medical University gratefully supported by Sida/SAREC, Sweden and Vietnamese authorities.

I am grateful to you who have inspired, encouraged and supported me during my PhD study. Thanking all of you by name is impossible in this space, but for you all, especially those not mentioned by name, I would like to express my sincere thanks.

Special thanks to:

Professor Peter Allebeck, main supervisor for his academic knowledgeable guidance through my research training and constant patience in my research work.

Associate professor Nguyen Thi Thu, co-supervisor for all the support I have got when I did my research work and in my personal life.

Professor Vinod Diwan and Associate professor Nguyen Thi Kim Chuc for working so hard to implement the FilaBavi and for accepting me to be one of the research students in the program.

Director board of Hanoi Medical University, Faculty of Public Health and Department of Environmental Health for their support and allowing me away from my work for studies.

Dr. Nguyen Hoang Long for advising during my research training.

All my friends and colleagues at the Department of Environmental Health, Hanoi Medical University for encouraging and sharing my work when I am away for studies.

My friends and colleagues at Division of Social Medicine and IHCAR for your help and sharing experiences in many aspects. All administrative staff for providing excellent working conditions at Karolinska Institutet.

My friends and colleagues in Vietnam-Netherlands project for your encouragement and supports, especially Dr. Nguyen Thi Bach Yen, Dr. Nguyen Van Hien and Dr. Kim Bao Giang.

My friends and colleagues in Health System Research Program and Department of Research Management, especially Ms. Nguyen Binh Minh, Dr. Nguyen Dang Vung, Dr. Vu Thi Vung, Dr. Nguyen Phuong Hoa, Dr. Le Thi Thanh, Ms. Anastasia Pharis, and Ms. Nguyen Thi Be.

My fellows in Karolinska Institute and in Common diseases project for good companying and sharing experiences.

People in Bavi district, all supervisors, surveyors and officers of FilaBavi for their dedicated input in the studies.

My great friend, Anna- Berit Ransjo-Arvidson for always being advisor and help. My house-mates for sharing experiences and fun.

My dear family: my husband Tran Danh Dang, our daughters Tran Phuong Thao and Tran Phuong Mai, my parents and brothers for all the love, understanding, encouragement, patience and tolerance.

Thank you all for your love!

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