INEQUALITY OF CHILD MORTALITY AMONG ETHNIC GROUPS IN THAILAND: A QUANTITATIVE AND QUALITATIVE STUDY

KWANCHIT SASIWONGSAROJ

A THESIS SUBMITTED IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR
THE DEGREE OF DOCTOR OF PHILOSOPHY
(DEMOGRAPHY)
FACULTY OF GRADUATE STUDIES
MAHIDOL UNIVERSITY
2008

Thesis
Entitled

INEQUALITY OF CHILD MORTALITY AMONG ETHNIC GROUPS IN THAILAND: A QUANTITATIVE AND QUALITATIVE STUDY

.....

Ms. Kwanchit Sasiwongsaroj
Candidate

.....

Assoc. Prof. Chanya Sethaput, Ph.D.
Major-Advisor

.....

Assist. Prof. Patama Vapattanawong, Ph.D.
Co-Advisor

.....

Dr. Kathleen Ford, Ph.D.
Co-Advisor

.....

Prof. Banchong Mahaisavariya, M.D.
Dean
Faculty of Graduate Studies

.....

Assoc. Prof. Chai Podhisita, Ph.D.
Chair
Doctor of Philosophy
Programme in Demography
Institute for Population and Social Research

Thesis
Entitled

INEQUALITY OF CHILD MORTALITY AMONG ETHNIC GROUPS IN THAILAND: A QUANTITATIVE AND QUALITATIVE STUDY

was submitted to the Faculty of Graduate Studies, Mahidol University
for the degree of Doctor of Philosophy (Demography)
on
9 January, 2008

.....
Ms. Kwanchit Sasiwongsaroj
Candidate

.....
Assoc. Prof. Bencha Yoddumnern-Attig, Ph.D
Chair

.....	.....
Mrs. Nanta Auamkul, M.D. Member	Assoc. Prof. Chanya Sethaput, Ph.D. Member
.....	.....
Dr. Kathleen Ford, Ph.D Member	Assist. Prof. Patama Vapattanawong, Ph.D. Member
.....	.....
Prof. Banchong Mahaisavariya, M.D. Dean Faculty of Graduate Studies Mahidol University	Assoc. Prof. Churnrurtai Kanchanachitra, Ph.D. Director Institute for Population and Social Research Mahidol University

ACKNOWLEDGMENT

First and foremost, I would like to offer my appreciation to my advisors: Dr. Chanya Sethaput, Dr. Patama Vapattanawong, and Dr. Kathleen Ford (University of Michigan), for their support, encouraging attitude, and honest constructive and critical advice so generously toward the completion of this dissertation. I am grateful to Dr. Nanta Auamkul from Ministry of Public Health, my external examiner, for her scientific guidance and suggestions despite her busy schedules. Also, I appreciate Dr. Bencha Yoddumnern-Attig, the chair of my dissertation examination committee, for her kindness in providing insightful comments and valuable suggestions.

I would like to convey my appreciation to Dr. Chai Podhisita, the Chairperson of the International Doctoral Program in Demography, for his kind support and continual assistance throughout my study. All contributions providing by lecturers and IPSR staffs have been invaluable in the course of my study and facilitated me to be able to accomplish this project. I would also like to thank the Wellcome Trust Foundation for the grant that supported my study in this program and made it possible to travel and perform the fieldwork.

I am deeply indebted to the Karen and Mon villagers, health workers, village chiefs, traditional healers, village health volunteers and traditional birth attendants for their time and sharing their knowledge, experience and opinions. Also, my thanks go to the translators. Without their assistance this study would not have been successful. I owe my sincere thanks to Boonthong's family and Huay Kob school for their kind support on accommodation, food, and other facilities during the fieldwork.

My sincere thanks go to all my friends for their understanding and valuable support, notably my best friends: Khwanchai Kerdbangnon and Nowrozy Jahan who are always dedicated their precious time for me. Finally, I am grateful to my family for their immense support and their patient in waiting for my achievement.

Kwanchit Sasiwongsaroj

INEQUALITY OF CHILD MORTALITY AMONG ETHNIC GROUPS IN THAILAND: A QUANTITATIVE AND QUALITATIVE STUDY

KWANCHIT SASIWONGSAROJ 4538038 PRDE / D

Ph.D. (DEMOGRAPHY)

THESIS ADVISORS: CHANYA SETHAPUT, Ph.D.,
PATAMA VAPATTANAWONG, Ph.D., KATHLEEN FORD, Ph.D.

ABSTRACT

This study was undertaken to explore the inequalities in child mortality among nine ethnic groups in Thailand, including the Thai. This study used both quantitative and qualitative approaches. The 2000 population and housing census was employed to estimate the mortality rates for children under five (Under-five Mortality Rate: U5MR) by using an indirect demographic method. The factors contributing to the differences of child mortality among ethnic groups were investigated through an ethnographic approach based on Mosley and Chen conceptual model (1984). Karen and Mon were purposively selected to explore the mortality inequality in the village context in the Kanchanaburi province.

The findings indicated that the U5MR was different among the nine ethnic groups throughout 1986-1996. The Chinese had the lowest rates followed by Thai, Khmer, Malay, and Mon, respectively, whereas ethnic hilltribes had higher rates than the former groups. The child mortality difference was mainly explained the by Mosley and Chen analytic model. The differences between U5MR were related to the socioeconomic status of a household. The ethnic groups with a higher socioeconomic status were more likely to have low mortality rates than their low socioeconomic status counterparts. Additionally, the findings from the qualitative method found a crucial factor, *assimilation,* that emerged beyond Mosley and Chen framework (1984). The Mon who had a higher probability of a child surviving than the Karen, habitually moved to settle close to Thai people. Their health perceptions and practices were shaped by Thai traditions that, in turn, led them to use health care services which benefited their children's health and survival. Meanwhile, the Karen had a subsistence living in inaccessible locations leading them to have a lower assimilation than the Mon. Their low income and lack of health information and knowledge impeded the Karen from seeking professional health services.

This study highlights the need for urgent policy initiatives to reduce the gap of child mortality, especially among ethnic hilltribes. An improvement in the socioeconomic status and access to health services may improve the chances of child survival among these groups.

KEY WORDS: INEQUALITY/ CHILD MORTALITY / ETHNIC GROUP / THAILAND

178 pp.

การตายของเด็กที่ไม่เท่าเทียมกันหว่างกลุ่มชาติพันธุ์ในประเทศไทย: การศึกษาเชิงปริมาณและเชิงคุณภาพ (INEQUALITY OF CHILD MORTALITY AMONG ETHNIC GROUPS IN THAILAND: A QUANTITATIVE AND QUALITATIVE STUDY)

ขวัญจิต ศศิวงศาโรจน์ 4538038 PRDE / D

ปร.ด. (ประชากรศาสตร์)

คณะกรรมการควบคุมวิทยานิพนธ์: จรรยา เศรษฐบุตร, Ph.D., ปัทมา ว่าพัฒนวงศ์, Ph.D., KETHLEEN FORD, Ph.D.

บทคัดย่อ

งานวิจัยนี้มีวัตถุประสงค์เพื่อศึกษาการตายของเด็กที่ไม่เท่าเทียมกันระหว่างกลุ่มชาติพันธุ์ 9 กลุ่มในประเทศไทย โดยใช้ระเบียบวิธีวิจัยเชิงปริมาณและเชิงคุณภาพ อัตราตายเด็กต่ำกว่า 5 ปี ประมาณโดยเทคนิคทางประชากรทางอ้อมจากข้อมูล สำมะโนประชากรและเคหะ พ.ศ. 2543 ส่วนการอธิบายสาเหตุความแตกต่างของอัตราตายเด็กที่เกิดขึ้น ใช้วิธีทางชาติพันธุ์วิทยาและยึดแนวคิดของโมสเลย์และเชน (1984) เป็นกรอบในการวิเคราะห์ โดยเลือกศึกษาเปรียบเทียบกลุ่มกะเหรี่ยงและมอญจำนวนสองหมู่บ้านในจังหวัดกาญจนบุรี

ผลการศึกษาพบว่าอัตราตายเด็กต่ำกว่า 5 ปี ของทั้ง 9 กลุ่มมีความแตกต่างกันตลอดช่วง พ.ศ. 2529-2539 โดยกลุ่ม ชาติพันธุ์จีนมีอัตราตายเด็กต่ำที่สุด รองลงมาได้แก่ ไทย เขมร มาเลย์ และมอญตามลำดับ ส่วนกลุ่มที่เป็นชาวเขามีอัตราตายเด็กสูงกว่ากลุ่มดังกล่าวข้างต้น ความแตกต่างของการตายในกลุ่มชาติพันธุ์อธิบายได้ด้วยกรอบการวิเคราะห์ของโมสเลย์และเชน โดยความแตกต่างของการตายขึ้นอยู่กับฐานะทางสังคมและเศรษฐกิจของครัวเรือน กลุ่มชาติพันธุ์ที่มีฐานะทางสังคมและเศรษฐกิจสูงมีอัตราตายเด็กต่ำกว่ากลุ่มที่มีฐานะทางสังคมและเศรษฐกิจต่ำ นอกจากนี้จากการศึกษาเชิงคุณภาพพบว่า *การผสมกลมกลืนทางวัฒนธรรม* ซึ่งเป็นปัจจัยที่อยู่นอกเหนือกรอบแนวคิดของโมสเลย์และเชน มีบทบาทสำคัญในการอธิบายความแตกต่างของการตายระหว่างกลุ่มชาติพันธุ์ มอญซึ่งมีอัตราตายเด็กต่ำกว่ากะเหรี่ยงเป็นกลุ่มที่มีการผสมกลมกลืนกับสังคมไทยมากกว่ากะเหรี่ยง การอยู่ใกล้ชิดกับคนไทยทำให้มอญได้ซึมซับและรับเอาแนวคิดและการปฏิบัติด้านสุขภาพแบบคนไทย ซึ่งทำให้มอญเข้าถึงและใช้บริการทางการแพทย์ที่เป็นประโยชน์ต่อสุขภาพและการรอดชีพของเด็ก ในขณะที่กะเหรี่ยงมีความเป็นอยู่แบบยังชีพในพื้นที่ห่างไกลทำให้กะเหรี่ยงมีการผสมกลมกลืนกับสังคมไทยน้อยกว่ามอญ และยังคงมีแนวคิดและการปฏิบัติตามความเชื่อดั้งเดิมประกอบกับมีรายได้น้อยและไม่ได้รับข้อมูลข่าวสารทางด้านสุขภาพ ทำให้กะเหรี่ยงเข้าถึงและใช้บริการที่จำเป็นต่อสุขภาพของเด็กน้อยกว่ามอญ ซึ่งเป็นสาเหตุให้เด็กชาวกะเหรี่ยงมีโอกาสรอดชีพต่ำกว่าเด็กชาวมอญ

ความไม่เท่าเทียมของการตายของเด็กที่เกิดขึ้นในกลุ่มชาติพันธุ์ของประเทศไทย โดยเฉพาะชาวเขา ควรได้รับความสนใจในระดับนโยบายเพื่อลดการตายที่แตกต่างกันลง ซึ่งการพัฒนาในเรื่องสถานะทางสังคมและเศรษฐกิจ และการเข้าถึงบริการสุขภาพเป็นช่องทางหนึ่งที่อาจช่วยให้เด็กกลุ่มดังกล่าวมีโอกาสรอดชีพมากขึ้น

CONTENTS

Page

CONTENTS (cont.)

Page

CONTENTS (cont.)

Page

LIST OF TABLES

LIST OF TABLES (cont.)

LIST OF FIGURES

LIST OF ACRONYMS

CEB	Children Ever Born
CI	Confident Interval
DHS	Demographic and Health Survey
MDG	Millennium Development Goal
PCA	Principle Component Analysis
SES	Socioeconomic Status
TBA	Traditional Birth Attendant
U5MR	Under-five Mortality Rate
WFS	World Fertility Survey

CHAPTER I
INTRODUCTION AND RATIONALE

1. 1 Rationale and Justification

Health inequality has become prominent on global policy agendas (Whitehead, 1998). Disparities in health status and health care among various populations are manifest in both developed countries and developing countries (Ajwani, et al., 2003; Gakidou and King, 2000). The concern about health inequality has varied greatly since the mid 1970s with the *"Health for All"* initiated by World Health Organization (WHO). One of the objectives is to improve equity in access to health and health care for all with government support or the development of free health care services to cover the entire population (WHO, 2000). Following the economic crisis experienced by many countries including Thailand, the campaign changed to the *"Health Sector Reform"* in the 1990s by reducing the direct role of the state and increasing the use of market-like mechanisms in health care provision. These changes would lead to decreased social justice and fairness (Braveman and Gruskin, 2003). Hence, equality of health has become an issue of concern in order to protect the right to health of vulnerable groups.

Poor or disadvantaged groups are the main of health inequality. Ethnic minorities are the one of vulnerable groups because of their social status. Certain ethnic groups are not accepted as citizens, and their status counts as illegal migrants, refugees, displaced persons, or minority groups that lead them to lack certain rights and to face alienation and racial harassment (Nazroo and Karlsen, 2001). Moreover, economic status, language barriers, and cultural health beliefs and behaviors, encompassing a range of biological and environmental exposures affect health status

(Chaturvedi, 2001). This evidence has evaluated in numerous studies (Braveman and Gruskin, 2003; Sangelek, 2002; Murray, et al., 1999; Neaton, et al., 1984).

Health inequality is typically evaluated in three dimensions of health outcomes; morbidity, disability, and mortality (WHO, 2000). Among all outcomes, mortality is the ultimate outcome of health. Mortality among infants and children is a crucial indicator of health status and socioeconomic development of a population. It is broadly used for assessing socioeconomic and health situations in developing countries (Minujin and Delamonica, 2001). Ethnic minorities have been exposed to considerable maternal and child health problems. Much evidence indicates that ethnic minorities in various countries have high levels of child mortality, including African Americans, American Indians/ Alaska Natives, and Hispanics in the United States (Berglas & Lim, 1998; Federal Interagency Forum on Child and Family Statistics, 2005), Maori in New Zealand (Ajwani, et al., 2003), Zang, Weiwuer, Yi, Buyi, and Miao in China (Yusuf and Byrnes, 1994), and several ethnic groups in sub-Saharan Africa (Brocherhoff and Hewett, 2000).

Studies on child mortality inequality have put much attention on ethnic or racial difference because of it has important implications for the health of mothers and children in multiethnic societies. The Thai population is characterized by its marked ethnic diversity. There are about 15 relatively large groups of ethnic minorities, including hilltribes (Highland Economic and Social Development Promotion Office, 2001). Ethnic people are distributed all over Thailand, especially in provinces located along the borders and highland areas. Most of them encounter health problems particularly maternal and child health. According to the Survey of Hilltribe Population (1985, 1986, 1987 and 1988), child mortality rates of minority groups are much higher than general Thais. For example the infant mortality of Karen in 9 studied provinces varied from 35 to 113 per 1,000 live births and under-five mortality rates were 48-148 per 1,000 live births (Kanchanasinith and Porapakkham, 1988). In addition, some evidence suggests that they cannot access health care services efficiently, such as antenatal care, immunization, and contraceptive services (Highland Health Development Center, 2005). Moreover, Highland Economic and Social Development

Promotion Office (2001) indicated that most minority peoples are on low income, have low levels of education, poor nutrition, and are at risk of trafficking.

Although, ethnic minorities comprise a small proportion of the population (about 1.7 percent) and half of them remain without Thai citizenship (Highland Economic and Social Development Promotion Office, 2001), the Thai government is greatly concerned about reducing health inequalities for these groups, and aims to improve Thai health by promoting health equality in The Ninth Five-Year National Health Development Plan. Thailand has also adopted the eight Millennium Development Goals (MDGs) since 2000 to endorse development, security and human rights for all. The fourth goal of this agenda is to reduce child mortality (United Nations, 2005) and under-five mortality rates (U5MR) should be reduced by two-thirds during 1990-2015 to achieve the target. According to the progress report (Bijorkman, 2004), some targets have already been achieved. Although U5MR is too low to be reduced by two-thirds among the majority of Thais but they remain high among minority groups, and in spite of success in meeting most MDGs, there are persistent disparities among regions and groups within the country. Thus, Thailand has set more ambitious targets -called MDG-Plus agenda- that go beyond aggregate national MDG achievements, focusing attention on vulnerable groups, minorities, and more neglected regions. The underlying MDG-Plus target on child mortality specifies reducing rates in highland areas, and in northern and southernmost provinces.

Even though, the mission on reducing child mortality inequality among minority groups was proposed as national policy several years ago, the studies in terms of health inequality mostly focus on general Thai people (Fhaumnouyphol, 2000; Benjakul, 2004). There are few studies on the health status of minority groups, especially mortality, and most of those were conducted using an anthropological approach; exploration of these groups has been limited. Because the studies focused on a single village or tribe, broader figures and comparative analyses of ethnic groups are rare.

Therefore, this study aims to explore child mortality at a national level among nine ethnic groups, and to compare their disparity rates using the 2000 Population and Housing Census. Factors contributing to inequality in child mortality were investigated based on Mosley and Chen framework (1984) through quantitative and qualitative methods.

1. 2 Research Questions

The main questions for this study are;

- Among relatively large ethnic groups in Thailand, what are child mortality trends and patterns?
- Is there any difference in child mortality among these ethnic groups?
- If there are some differences, which groups are more and less vulnerable in terms of child mortality?
- What factors can explain child survival inequality among them?

1.3 Objectives

(1) To explore mortality differentials among ethnic groups in Thailand.

(2) To investigate factors contributing to inequality in child mortality among ethnic groups in Thailand.

This thesis is organized as follows. Chapter I proposes statement of the problem, including the objectives. Chapter II gives a brief review of certain essential concepts for study on child mortality inequality among ethnic groups and illustrates the brief features of ethnic groups in Thailand as well as child mortality trends at a national level since from past to recent periods. The methods and findings conducted through different approaches are described separately; “mortality differentials among ethnic groups” carried out by quantitative methods is reported in chapter III and “factors contributing to inequality in child mortality” conducted by qualitative methods is reported in chapter IV. The last chapter (chapter V) concludes with the significant findings and makes useful recommendations.

CHAPTER II
LITERATURE REVIEW AND THEORETICAL FRAMEWORK

This chapter proposes crucial concepts in exploring inequality in child mortality among ethnic groups including principal concepts of inequality in mortality, ethnicity and health, and factors contributing to inequality in child mortality. Together, a brief overview of ethnic groups in Thailand and the historical situation of child mortality are described.

2.1 Inequality in Mortality: Main Concept and Principle

The distribution of health outcomes, morbidity, disability, and mortality, among and between populations has for several years been expressed most powerfully in terms of ideas on '*inequality*' (Kawachi, et al., 2002). Health inequality is the generic term used to designate differences, variations, and disparities in the health achievements of individuals and groups. These notions are not just *'differences'*. There may be differences between species, races, sexes, and people different age, such as differences in morbidity between elderly people and younger people or differences in mortality rates between people from different social classes. Health inequality is a descriptive term that need not involve moral judgment (Murray, et al., 1999).

The term of inequality is close to "*inequity*" but there are some differences. Health inequity refers to those inequalities in health that are considered to be unfair or unjust when the inequalities are avoidable or unacceptable. However, there are some difficulties in adopting *preventabilit*y and *necessity* as criteria for the definition of health inequity. According to Kawachi, Subramanian, and Almeida-Filho (2002), the distinction between equality and equity is that the identification of health inequities

involves judgment principled upon (1) one' theory of justice; (2) one' theory of society; and (3) one's reasoning underlying the genesis of health inequalities.

Mortality inequality is one aspect of health inequality. Generally, this term is referred to *"mortality differentials"*. The difference of mortality levels is typically described across sex, race or ethnicity, geographical area, and socioeconomic status. Mortality inequalities across social groups (such as social class and ethnicity) mostly are unjust because they reflect an unfair distribution of the underlying social determinants of health (Kawachi, Subramanian, and Alimida-Filho, 2002). Commonly, mortality inequalities are assessed to determine disadvantaged groups in order to improve their health status. Among the disadvantage groups frequently studied are those based on ethnicity and socioeconomic status, especially ethnic minorities due to such factors as exposure to disease, hazardous environment, or low economic opportunity (Wilmoth and Dennis, 2000).

2.2 Ethnicity and Health

2.2.1 The concept of ethnicity

It is important to understand the roots and mechanisms of mortality inequality among ethnic minorities through their ethnic affiliation for the extent to which ethnic differences reflect variation in health care behavior, health-promoting behavior, access to health care, genetics, and other factors.

Ethnicity is tied to concepts of shared *origins* and shared *culture*. Its meaning is similar to the concept of race, but races have often been distinguished on the basis of physical characteristics, while ethnic distinction commonly focus on such cultural characteristics as history, politics, religion, language and customs (Bulatao and Anderson, 2004). The definition of ethnic minority can vary, depending on specific context, but generally refer to *"a subgroup having special characteristics within a larger group, often bound together with a common cultural heritage that distinguishes them apart from others in the larger group"* (The National Institute of Health, The University of Adelaide, 2004). In addition, in certain contexts, an ethnic minority group refers to a social group whose members are subject to different and unequal

treatment in the society in which they live and regard themselves as objects of collective discrimination (McElroy and Townsend, 1996).

Affiliating with a particular ethnic group can be associated with health in a variety of ways. Differences in ethnicity may have variation in genetic characteristics that could produce differences in susceptibility to disease. As ethnic identity influences personal habits, it may be associated with ways of behaving and reacting to the social environment that have implications for health. The social class that an ethnic group is set may lead them to variation in socioeconomic opportunity and health resource accessibility as well (Loustaunau and Sobo, 1997).

2.2.2 Ethnic differences in health

The root factors of health differences that lead to variation of health outcomes in all age of ethnic groups were classified into three broad categories (Anderson, 1995; Hummer et al., 1998; Kington and Nickens, 2001):

(1) *Genetic factors:* In considering ethnicity and health, different ethnic groups may contain different frequencies of genes that are pertinent to health status or to disease process. In the other senses, the phenotype consequent on a given genotype may vary between ethnic groups because of interactions with environmental factors. However, there is a great complexity in the relationships of genes to ethnic health differences. It is important to realize that genetic influence is mediated through a causal links containing all of complex structures and functions of the human organism such as the anatomy, biochemistry, physiology, immunology, and endocrinology (Bulatao and Anderson, 2004).

(2) *Macrosocial factors:* Widening social inequalities between ethnic groups have led to widening health inequalities. Ethnic disparities in health occur from differential access to the political, social environmental, economic and behavioral determinants of health, resulting in differential incidence of illness and mortality (Whitehead, Scott-Samuel & Dahlgren, 1998). The social factors usually mentioned in various studies (Elo and Preston, 1997; Pamuk, 2000) are culture, institutions and

politics, media, socioeconomic status (including education, income, wealth, employment, and occupational status), social environment (residential factors, household factors) and other social factors (marital status, social participation and support, nativity and religion).

(3) Health behavior:

(3.1) Behavioral risk factors that are produced chronic disease (e.g. diet, exercise, smoking, alcohol consumption).

(3.2) Risk taking and abusive behaviors that are related to infectious disease and injury (e.g. sexual practices, injury risk behavior, violent behavior, drug abuse).

(3.3) Adaptive health behaviors (e.g. coping strategies, protective cultural practices, social support).

(3.4) Health care behavior: the utilization or avoidance of health care, health care seeking behavior, self-care practices, provider behavior, the doctor-patient relationship, and adherence to medical regimens.

Kinton and Nicken (2001) explained other factors contributing to ethnic differences in health. Figure 2.1 illustrates that genetics in different ethnic groups is linked to specific diseases. Acculturation is introduced as a factor that affects health risk behavior over time. Socioeconomic status is implicated in ethnic health differences. People in different ethnic groups may have different levels of education, income and social class that can affect opportunities to access health care, health risk behavior, and exposure to psychological problems, and unsafe environment.

Figure 2.1 describes health differences in all age groups, however for child health, the factors contributing to their health and mortality differ from other age groups. Child health conditions and mortality depends largely upon their parents and the general economic circumstances of the household.

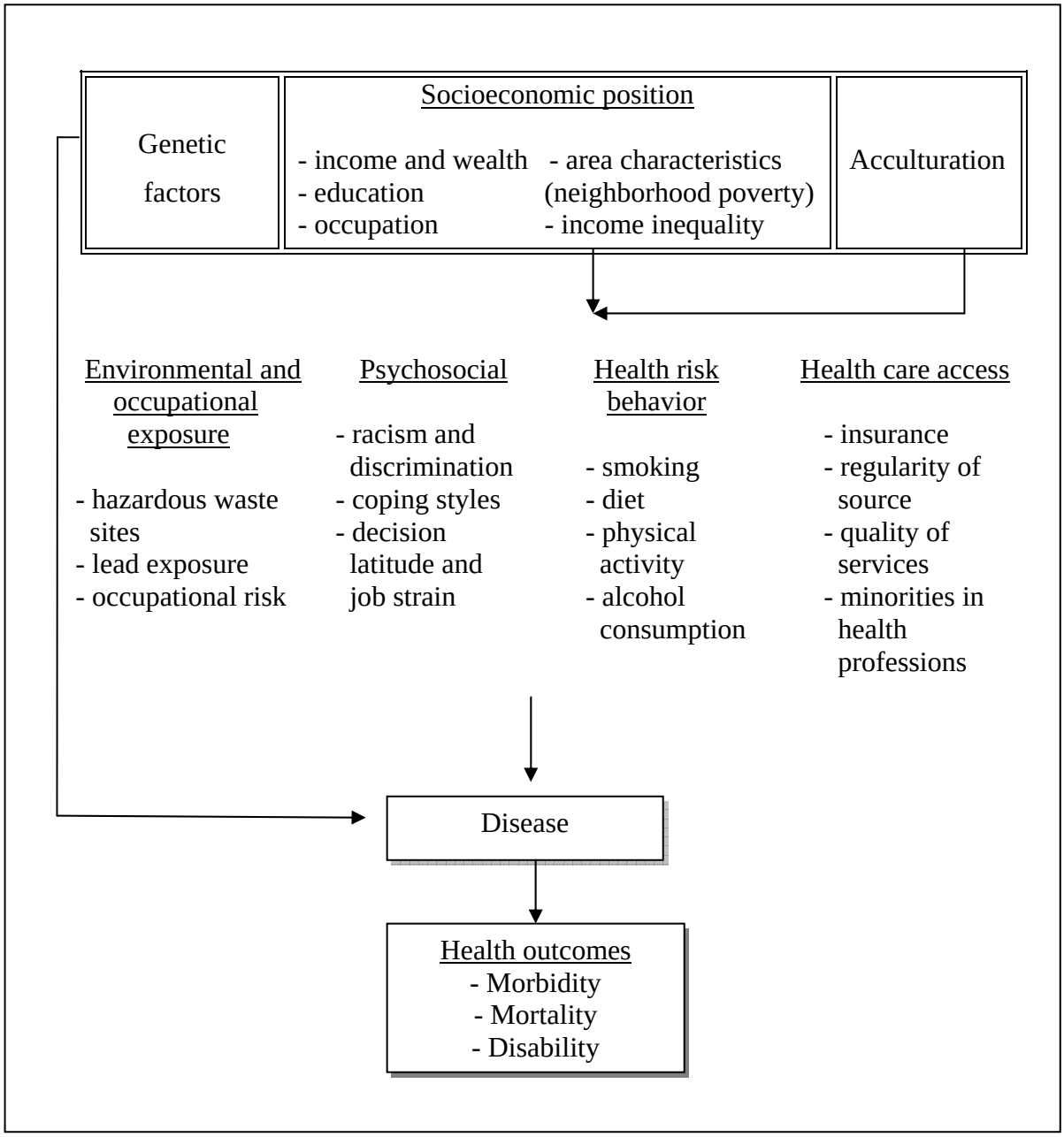


Figure 2.1 Factors in ethnic difference in health.

Source: Kington and Nicken (2001) in Rodolfo A. Bulatao and Norman B. Anderson. 2004. *Understanding Racial and Ethnic Differences in Health in Late Life: A Research Agenda*. Washington, DC: the National Academic Press: 34.

2.3 Factors contributing to inequality in child mortality

Many health factors are associated with child mortality. The most well-known analytic framework for the study of the determinants of child survival in developing countries was proposed by Mosley and Chen (1984). This framework has aided advanced research on social policy and medical interventions to improve child mortality. The conception incorporates both social science and medical science approaches by basing on the premise that all social and economic determinants of child mortality essentially operate through a common set of proximate determinants, to affect child survival.

The model developed by Mosley and Chen identifies a set of proximate determinants, or intermediate variables divided into five categories; (1) maternal factors; (2) environment contamination; (3) nutrient deficiency; (4) injury; and (5) personal illness control.

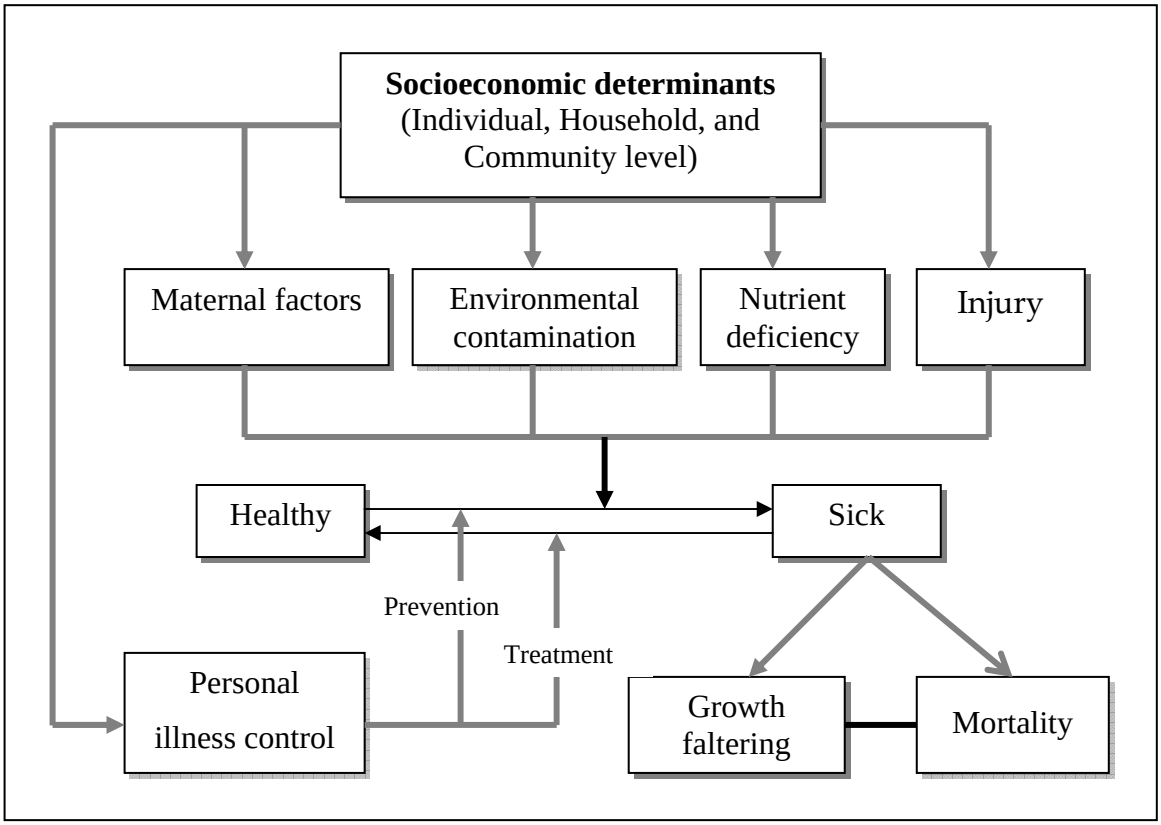


Figure 2.2 The conceptual model of proximate determinants on the health dynamics of children by Mosley and Chen (1984)

Source: Mosley and Chen. 1984. An Analytical Framework for the Study of child Survival in Developing Countries. *Population and Development Review*,10: 29.

According to numerous studies and the conceptual model of Mosley and Chen, the factors affecting infant and child survival can be described of three levels;

2.3.1 Individual levels

Mosley and Chen (1984) divided the individual level into two parts: individual productivity and cultural traditions of the society which shape the economic choices and health behaviors of individuals. The vast majority of factors contributing to child ill health and mortality centres on maternal characteristics and behaviors. For logistical reasons, the mother has biological links with the infant during pregnancy and lactation period. Thus, the mother's health, nutritional status, fertility behaviors and the use of health care comprising pre-natal care, delivery care, and post-natal care, have a direct effect on child mortality. Furthermore, the mother generally takes responsibility for her child, and her attitude, knowledge, time and skill can influence the chances of child survival.

2.3.1.1 Individual productivity

***Fertility behavior*:** Many studies have shown a strong relationship between fertility behavior of women and child survival chances. Typically, there are three characteristics of fertility behavior associated with infant and child mortality; maternal age at time of child birth, length of birth interval, and birth order. Mothers who are too young or too old are generally mentioned as demographic risk factors for child deaths. A short birth spacing and high birth order may affect both maternal and fetal health as well as availability of time for child care.

The negative impact of risk fertility behavior on infants and child mortality is well documented. Rutstein (2000) examined the influences of the risk fertility behavior on child mortality in large figure of developing countries. The Demographic and Health Survey (DHS) in 56 developing countries during the 1990s was used for analysis. The results indicated that first birth order, a short birth spacing (less than 24 months), the births to mothers under age 18 and more than 35 years were associated with higher mortality rates but an increase in the percentage of fourth or higher order

was associated with a decrease in child mortality rates. Small-scale studies in Nepal (Population Family and Children [Nepal], 2002), Vietnam (Population Family and Children [Vietnam], 2002), and India (Whitworth and Stephenson, 2002) yielded similar results. For instance, Whitworth and Stephenson examined the impact of the length of the birth interval on under-two mortality in India, using the 1992 Indian National Family Health Survey. The results show that short birth intervals (less than 18 months) are associated with an increased risk of mortality in child mortality, particularly in the early post-neonatal period. For ethnic minorities, Kunstadter et al. (1993) studied fetal and child mortality of Hmong in Thailand in the mid-1960s to the mid-1980s. Infant mortality rates were highest among higher order births (birth of order 9) and for births to mothers of the highest ages (more than 40 years) and there is relatively small effect on risk of infant mortality of first order pregnancies, or births to very young mothers (10-14 year old).

Maternal education: A number of studies have illustrated a statistical association between education of mother and childhood mortality in developing countries. As a result of studies, the relationship between maternal education and child mortality can be separated into two propositions. First, education relates to maternal health behavior on child care and the use of health services. Bicego and Boerma (1993) conducted a large comparative study of survey data from 17 developing countries. The outcomes reveal that under nutrition (stunting) of children under-two years and non-use of antenatal services were most closely linked to levels of maternal education. Pandey (1997) revealed a strong relationship between child survival chances and mother's level of education in Mongolia in 1994. Children of mothers with no or only primary education experienced about two times the level of under-five mortality compared with the children of women educated up to secondary or higher levels. Education also affects maternal fertility behaviors that benefit to child survival: higher education is linked to lower fertility, late age at marriage and longer birth intervals (Obeng and Gyimah, 2002).

Second, a function of education affects to child mortality through the linkage of economic status. Educated women have an advantage in accessing income sources

and have more economic power that leads to autonomy in child care and health care utilization (Ojanuja and Gilbert, 1992; Frost, Haas, and Forste, 2002). However, Father's education also has an influence on child mortality, usually relate with occupation, household asset, and household income (Kiros and Hogan, 2001).

Use of health service by mother and for children: As already mentioned, the use of health care is associated with the level of education of the mother. Not only education, but socioeconomic conditions also engage with health care utilization for both mother and children. The use of antenatal care, birth attended by modern practitioners, immunization and well-baby clinic attendance are usually treat as indicators of the use of health care utilization. Brockerhoff and Hewett (2000) noted that the use of preventive health services, tetanus toxoid immunization and multiple antenatal cares, by mothers exhibited strong effects on infant survival in 11 countries in sub-Saharan Africa. The study on children aged 0-23 months in 5 countries in East Africa (Brockerhoff and Derose, 1996) illustrates a large proportion of child mortality; 34%, was associated with missing at least one immunization shot against a preventable disease, and low use of antenatal care or giving birth outside of health facilities, were associated with 12 and 11 percent of mortality respectively.

Child care: Most children are reared by parents, but parenting arises within contexts conditioned by culture, economic structures, and national health care policies (Heaton et al, 2005). Most researchers emphasize breastfeeding as one of the vigorous predictors of child health, because breast milk is perfectly suited to nourish infants and can protect them from illness. Manda (1999) revealed that children in Malawi who had never been breastfed or stopped breastfeeding due to their illness or their mother's illness were 4.3 times more likely to experience infant mortality than children who continue to be breastfed. According to Kunstadter et al. (1993), a certain explanation for the 60% decline of infant mortality among the Hmong in Thailand during 1960s-1980s which related to child care practices was prolonged breastfeeding and nourishing mother' s breast milk mixed with eggs and chicken, called '*chicken soup theory'*.

2.3.1.2 Cultural traditions

Woman's status: Theoretically, women's status is defined as the potential of women to access material (income, land, food, or wealth) and social resources (education, knowledge, rights, or power). Status of women can be conceptualized on two levels; within a household, regarded as micro level and within society, regarded as macro level (Rothschild, 1982).

Woman's status may vary according to different social contexts and may affect their child's health and mortality in both positive and negative ways. Women who have autonomy in decision-making are more likely to have higher levels of contraceptive use that might improve reproductive behavior risk; prolong birth intervals and low fertility (Dyson and Moore, 1983). In most traditional societies the woman has less power and control of household resources for herself and her child. In addition, the decision making habitually depends on male or elders. In Indonesia, where the differences in ethnicity and culture are prominent (Widayatun, 1991), a study shows regional variations in the status of women. In the south and central highlands, women have comparatively higher status in both household and society than women in the north and west. Also, the analysis revealed that the status of women was closely related to infant and child mortality. Recent study in India (Maitra, 2004) has confirmed that a woman's control over household resources (ability to keep money aside) has a significant positive effect on both the demand for prenatal care and the probability of hospital delivery.

Value of children: This cultural belief has an influence on sex preference and child care. Some of the excessive female child mortality may initiate from gender bias in child rearing customs correlated with cultural beliefs (Choe et al., 1998). In Hmong society, children are valuable: a son is perceived as the source of parent support in the future while a daughter is seen as a helper in domestic tasks and a source of dowry for their son (Podhisita et al., 1990).

Belief about cause of disease: Cultural contexts in each society generally have an influence on the perception and world view of members including beliefs about causes of illness. Perceived etiology of childhood disease is likely to affect disease management and health outcomes, especially in societies where people hold on folk beliefs and modern medical knowledge is limited (Goldman, Pebley, and Gragnolati, 2002). For instance, Feyisetan et al. (1997) studied the influence of cultural beliefs on childhood diseases in Yoruba society. They found that most mothers perceived *'too much heat'* or *'dry season'* as the cause of measles, *'teething'* as the cause of diarrhea, and malaria caused by *'playing too much in the sun'* and this led them to ignore modern preventive medicines and curatives. Another research (Sasiwongsaroj, 1998) indicated the perception of some Burmese migrant mothers that diarrhea was caused by *'fermented breast milk'*, *'fate'* or *'spirit'*. As a result, they ignored the appropriate treatments for their children, and hence, the symptoms in some cases got worse.

Other marvelous studies, mostly conducted in Africa, reveal unusual findings in the relationship between cultural beliefs and child mortality. In some communities in Nigeria, twins are described as *'spirit child'* or *'evil'* and believed to be a bad omen for the family, thus they are often killed at birth (Senah, 1993). The belief of *'spirit child'* also has an influence in communities different from the main tribal groups in Ghana. A qualitative study by Allotey and Reidpath (2001) demonstrated that almost 15 percent of deaths of infants aged under 3 months were due to infanticide because of their parents belief in '*chichuru*' or *'spirit child'*. Most spirit children were identified by physical abnormalities such as very large or very small heads, teeth at birth, and dislocated or broken limbs.

2.3.2 Household level

Various studies of household factors highlight the importance of the family as a unit which functions to influence the well-being of individual members. Families make decisions and allocate resources essential for child health and survival (Defo, 1997).

Household economic conditions: Economics in a household generally translate to the living conditions of members, particularly child health. Families with high economic status are able to provide better health care, feed, and clothe their children as well as afford enhanced sanitary living conditions such as hygienic latrines, piped water, and electricity. Study in Brazil (Alves and Belluzzo, 2004) reveals that a rise in per capita income contributed to the decline of infant mortality. A similar study in Sudan, Maglad (2000) used household data to examine the interaction between income and child mortality. The income per adult was found to have a significantly negative impact on child mortality. Using a different method, Minujin and Delamonica (2006) devised a wealth index to examine the differentials of under-five mortality rates (U5MR) in 24 developing countries. The results showed that on average children belonging to families in the bottom quintile have more than twice the chances of dying before reaching 5 years of age compared to children living in families in the top quintile.

Housing condition: Both size and quality of living quarters are factors affecting to child survival. Crowded housing and poor ventilation might be the causes of some infectious diseases. Also, access to safe water, electricity and sanitation are greatly connected with hygienic care. Among Asian countries, findings from the China National Child Health Survey (Wang, Hughes, and Fan, 2002) show that children living with poor access to flush toilets have significantly high mortality risk. Similarly, in Bangladesh (Sarker and Chandra Saha, 1998), mortality risk was lower among the children living in the households supplied with drinking water from tube wells. In cross-country research, Wang (2003) used Demographic Health Survey (DHS) of 60 low-income countries to investigate the determinants of child mortality. The finding demonstrates that access to electricity has the largest impact on reducing mortality in comparison to access to safe water and sanitation.

2.3.3 Community levels

Geographical setting: Ecosystems help in understanding how environment changes relate to health and survival. In remote communities, child survival may be strongly affected by quantity and variety of food crops, the availability and quality of

drinking water, pervasiveness of vector-borne disease transmission, and accessibility to medical facilities. Kasiev and colleagues (2005) founded that infant and child mortality in urban areas of Kyrgyz Republic in 1997 are lower than the estimates for rural areas. Likewise, Sherbinin (2004) reveals that there is a significant relationship between infant mortality and biophysical variables (e.g., soil quality, drought prevalence, malaria prevalence, and water availability) and geographical factors (e.g., urban area, and distance to ports, roads and railroads).

Health care system: The impact of service conditions on maternal and child health varies between populations and geographical setting. It generally relies on the coverage of health services, accessibility of the services, and the quality of the care provided. Williams et al. (2005) found that one reason that caused the high infant mortality rates in Kabul, Afghanistan delayed in reaching the health facility. Afghanistan does not have the infrastructure for a functioning emergency medical system. Similarly, Foggin et al. (2001) studied child mortality among the Miao in Yunnan, Southwest China. They clearly found that the communities where better transportation and health care infrastructures existed had substantially lower infant mortality rates than those which lacked of accessibility to adequate health care facilities.

2.4 The Context of Ethnic Groups in Thailand

Thailand is a multiethnic country with approximately 62 distinct ethnic groups classified by language including the majority Thai (Premsrirat et al., 2004). There is an atmosphere of blended culture behind dominant Thai culture as there have been various ethnic groups living together with the Thais since ancient times. Each ethnic group has its own history and distinct culture. The following section briefly describes features of the relatively large ethnic groups.

Chinese

The Chinese are a relatively large sub-group in Thailand. The history of Chinese immigration into Thailand dates back several centuries, at least to the thirteenth century with Ayutthaya period. Due to famine, the enormous increase of the population in China, and the Chinese Revolution, Chinese migrated to Thailand in

search of a better life. There has been minimal group migration across Thailand since the early 1900s. They mainly reside in urban areas, especially in central and southern parts of the country. Due to the long period of settlement in Thailand and intermarriage with native Thais, Chinese have assimilated well into the dominant Thai community. The descendants of overseas Chinese, called Thai Chinese, have become Thai citizens. Hence, there can be no definite figure of ethnic Chinese in Thailand. The Chinese are economically advantaged when compared to the dominant groups. Reports indicate that Thai Chinese control a large part of the business interests in the country (Lim and Gosling, 1993). There are no formal or societal restrictions against the political participation of the Thai Chinese, and they are reported to have gained significant political power in this country.

Malays

The term *Malay* can refer to the ethnic group who predominantly inhabit the Malay Peninsula which includes the southernmost part of Thailand (Pattani and Satun) and east Sumatra as well as Borneo. Ethnic Malay are predominantly Muslim. In Thailand, this group mainly speaks malayu language and concentrates in the southern part of the country. The majority of Malay are self-employed either as farmers, fishermen, or gardeners growing a variety of native crops, which include rubber, coconut, and tropical fruits. Although Malays born in Thailand have Thai nationality, almost all Malays have a distinct life style different from Thais and less acculturated towards the main stream due to their adherence to the Islamic faith, especially in the southernmost provinces, (Mauwad, 2005). Some devout groups have developed a feeling of uniqueness and independence (Aphornsuvan, 2004).

Khmer (Suay)

The majority of the world's Khmer live in Cambodia. There are also significant Khmer populations native in Thailand and Vietnam (known as Khmer Khom). Certain evidence suggests that Khmer people have been living in Thailand since before the Sukhothai era. Several provinces in Northeast Thailand; Nakhon Ratchasrima, Burirum, Surin, Srisaket, and Ubonratchathani were residential areas of the ancient Khom (Saraya, 1994). After the Sukhothai kingdom come to dominate these areas, the

majority of them shifted to Cambodia and the rest stayed and became the original generation of Khmers in Thailand. In the Thonburi period, huge numbers of Khmer moved to settle in Surin province (Meekusol, 1990). All their descendants have virtually been absorbed into Thai society and become Thais. However, the way of life of Khmers in Thailand is relatively similar to Khmers in Cambodia, particularly customs related to birth, marriage, and death, beliefs, traditional treatment, as well as leisure (Phon-ngam, 1995).

Mon

The Mon was one of the earliest ethnic groups to settle in Thailand. Originally they lived in Mon state located between in Kayin (Karen) state in the east and the Andaman Sea in the west. It has a short border with Thailand's Kanchanaburi province at its south-eastern tip. They moved to settle in Thailand in various eras since Ayutthaya period. Mon was given special areas to reside, mostly around Chao Praya River and Mae Klong River, and found favor under Thai kings. The Mon who migrated since Ayutthaya era are called *"Old Mon"* and those who migrated around early Rattanakosin period, *"New Mon."* The majority are scattered around Bangkok periphery near the main river in Patumthani, Samut Prakran, Ratchaburi, Nakhon Pathom, and other provinces in central Thailand (Deephadung, Ausupharat, and Dam Sa-ad, 1999). The contemporary Mon of Thailand, most of whom are descendants of prisoners of war and refugees who entered Thailand during last 500 years, are now assimilated into Thai society, however, their old traditions can still be seen. To date, migration to Thailand among Mon still occurs, mostly along the Thai-Myanmar border because of an ethnic conflict and political ideology. Their status remains as migrants or refugees.

Hilltribe groups

Thailand contains a large number of hilltribe people who are scattered across the mountain areas of the northern region. Officially, hilltribe people are recognized in nine principal tribes: Karen, Hmong, Lahu, Akha, Lua, Yao, Khamu, and Htin. Within this category, Karen are the largest group, followed by Hmong and Lahu, respectively. The ethnic hilltribes are different from other ethnic groups mentioned in terms of their legal status. For those concerned with legal status, hilltribes are divided into three

groups. The first group comprises original hilltribe people living in Thailand. They can seek Thai citizenship, but many of them have not yet been granted Thai nationality. The second group included hilltribe people entering Thailand before 3 October 1985. They are eligible to seek legal status to live in Thailand and will be able to seek Thai nationality later. The third group consists of hilltribe people entering Thailand after 3 October 1985. They are considered illegal residents who could face deportation. But the Government allows them to stay temporarily pending verification. Children of hilltribe persons are granted Thai citizenship, as they were born in Thailand (Aguettant, 1996).

Additionally, with regard to location, ethnic hilltribes can be divided into two groups; groups that inhabit at the lower slopes, including the Karen, Lawa, Khamu and H'tin; and groups which reside at the top called *"highlanders"* including Hmong, Akha, Lahu, Lisu and Mien. Each tribe upholds its own traditions, wears a distinctive style of dress, and speaks its own language (Tribal Research Institute, 1998). In comparison with the majority Thais, hilltribes suffer greater disadvantage in transportation, education, and health. Furthermore, their income is far below that of the ethnic Thais. The details of certain relatively large groups of ethnic hilltribe are described below.

Karen

The Karen, who call themselves Pwakin-nyaw and who are known as *"Kariang"* to ethnic Thais, are one of the largest hilltribes in Southeast Asia. The Karen come from a diverse ethnic mix with many different languages and religions. The Karen in Thailand can be divided into 4 groups: Sgaw, Pao, Pwo, and Kayah (Schrock et al., 1970). Within this category, the Sgaw is the largest groups and have their own written language. The Karen originates from Burma and immigrated in large numbers to Thailand as a result of war. The period of initial migration is somewhat obscure; it may have occurred in Ayuthaya period (Ratanakul and Burutpat, 1995). Many Karen continued to migrate to Thailand even after the war. In Thailand the Karen are found primarily in the north and northwestern areas, along the border with Myanmar. In the past, the Karen worshipped their ancestors and believed in

supernatural powers. In time, most Karen groups either adopted Buddhism or Christianity. Traditionally, the Karen lives at lower elevations than other hilltribes and prefers to stay in their original place, and do not move their villages like other hilltribes do. The Karen is skilled farmers in both wet and dry rice cultivation (Schrock et al., 1970).

Hmong

Hmong (Meo, Meau, or Miao which is called by Chinese) living in Thailand first migrated from China through Myanmar, Vietnam, and Lao during the Second World War. Hmong in Thailand belong to two distinct groups, the Blue Hmong and White Hmong, classified by their dress and language (Deepadung, 1996). They settled on hill tops and carried out their traditional shifting cultivation in relative peace and isolation. In the past, many Hmong were relatively wealthy compared to other highlanders due to their income from opium. But since the early 1980s Thai government enforcement of regulations against opium poppy cultivation, they have changed to cultivate economic cash crops (Kunstadter et al., 1993) under the supporting of The Royal Project Foundation[1] . According to Young (1962), the Hmong are business-minded people as is evident by their involvement in the small trade of cash crops.

Lahu

Like most Hilltribes, the Lahu have their origin in China and Tibet. After the Lahu were defeated by the Chinese, they moved to Myanmar and Thailand as their final destination (Sirisai, 1996). Lahu living in Thailand are divided into five sub-groups, the Red Lahu, Black Lahu, Lahu Sheleh, Lahu Balan, and Lahu Bankeo. They are known to the Thai as *"Musur"*, which means *"hunter"*, as they excel at this skill (Forbes, 2004). The Lahu are located primarily in Northern provinces, but can also be found in considerable numbers in lower Northern provinces. Their settlements are

[1] The Royal Project Foundation was launched by His Majesty King Bhumibol in 1969 in order to reduce slash and burn practices and cultivation of opium poppy and to motivate appropriate cash crop and agricultural technology derived from research to the hilltribe people and to surrounding lowlanders. (Available at: http://www.doikham.com/general/english/index.html Cited: 5 October, 2007)

usually remote from roads and towns, due to their strong commitment to the maintenance of the Lahu way of life. They earn their living by subsistence agriculture, growing rice and corn for their own consumption, and hunting. Lahu are also proud of their hunting heritage. This tribe is still strongly dedicated to traditions of unity and working together for survival. Lahu adhere to animism, though in recent decades many have been converted to Christianity and Buddhism. Numerous Lahu are noticeably less well off than other hilltribes such as the Hmong, Lisu and Mien.

Akha

Akha, also known to the Thai as *"E-gaw"*, are located in Northern provinces. They are closely related with Yunnan province of China. Of Tibetan origin, they are the most recent hill people to migrate Thailand. Akha are a relatively poor tribe living on the top of mountainous areas. The Akha speak a language in the Lolo/Yi branch of the Tibeto-Burman language group, but have no traditional written language. They practice animism, ancestor worship and have a strong attachment to the land. Their livelihood is based on shifting cultivation of various crops including maize, dry rice and temperate vegetables, including opium which they have changed to commercial cash crops since the Royal Project Foundation was introduced.

2.5 Child Mortality in Thailand

The average global under-five mortality rates (U5MR) declined by 11 per cent globally, from 93 deaths in the early 1990s to 83 deaths per 1,000 live births in 2000. Child mortality varies between countries with the stage of development. Most countries in East Asia and Pacific are also showing progress in reducing under-five mortality rates (U5MR) but the reduction pace is rather slow. Of approximately 1.1 million child deaths in 2002 in the region, the major causes relate to perinatal events (45 per cent), diarrhea (17 per cent), and acute respiratory infections (16 per cent). Vaccine- preventable diseases (including tuberculosis) and unintentional injuries account for another 15 per cent. Other causes of death (i.e. vector-borne disease, meningitis and HIV/AIDS) are less significant (UNICEF, 2005).

In Thailand, there have been various estimates of under-five mortality rates that yielded different levels and trends depending on the sources of data (figure 2.3). U5MR (per 1,000 live births) derived from civil registration by year estimated by Hill and colleagues (2006) are almost 30 years, has significantly declined from 43 in 1975 to 11 in 2004, though the trend in the 1990s has stabilized to around 10. On the other hand, the levels of U5MR joint estimated (2006) from Demographic and Health Surveys (DHS) by United Nations Children's Fund (UNICEF), World Health Organization (WHO), World Bank, and United Nations Development Program (UNDP) were substantially different, with rather higher levels, declining from 148 in 1960 to 21 in 2004. The rate obtained from the civil registration seems to be lower than reality. Numerous researchers have indicated that the low rate might be attributed to under-registration of children deaths. According to the 1974-1976 Survey of Population change (SPC), about 41 percent of the total deaths were not registered in the official system. Likewise, a study of Rukumnuaykit (2006) estimated infant mortality rate using six surveys of SPC and death certificates revealed that the incompleteness of infant mortality registration was reported at about 60-70%. This severe defect may affect to U5MR as well. On the other hand, it was found that the different rates from different sources of data were caused by identification of place of death. For instance, civil registration would identify the death at the place of occurrence, while the SPC would identify it at the place of residence (National Statistical Office, 2003).

However, all sources of data verify that U5MR in Thailand has been declining. For international comparison, the rate provided from joint estimates is accepted. In terms of international ranking in 2005, Thailand was placed 108/192 (UNICEF, 2006). Although U5MR for Thailand is lower than the regional average (36/1000), it is still higher than that of some neighboring countries such as Singapore (3/1000) and Malaysia (12/1000). In accordance with the Millennium Development Goal 4 (reducing child mortality by two thirds between 1990 and 2015), Thailand is obliged to achieve the mortality under the age of five at the rate of 12/1000. Ethnic minority groups have attracted most attention for accomplishing the fourth goal.

Unfortunately, there is little estimation on U5MR of ethnic groups in Thailand. Kanchanasinith and Porapakkham (1988) conducted indirect estimates of U5MR of 9 groups of hilltribes in 10 provinces in northern Thailand using the Survey of Hilltribe Population in 1985-1988. Since the U5MR presented by tribe within each province, it does not represent the rates for each tribe as a whole. The rates for each tribe varied in 10 provinces. For example, in 1986, U5MR of Karen was 81/1000 in Chiangmai and 48/1000 in Chiangrai. Figure 2.4 displays 3 ethnic hilltribes in selected provinces.

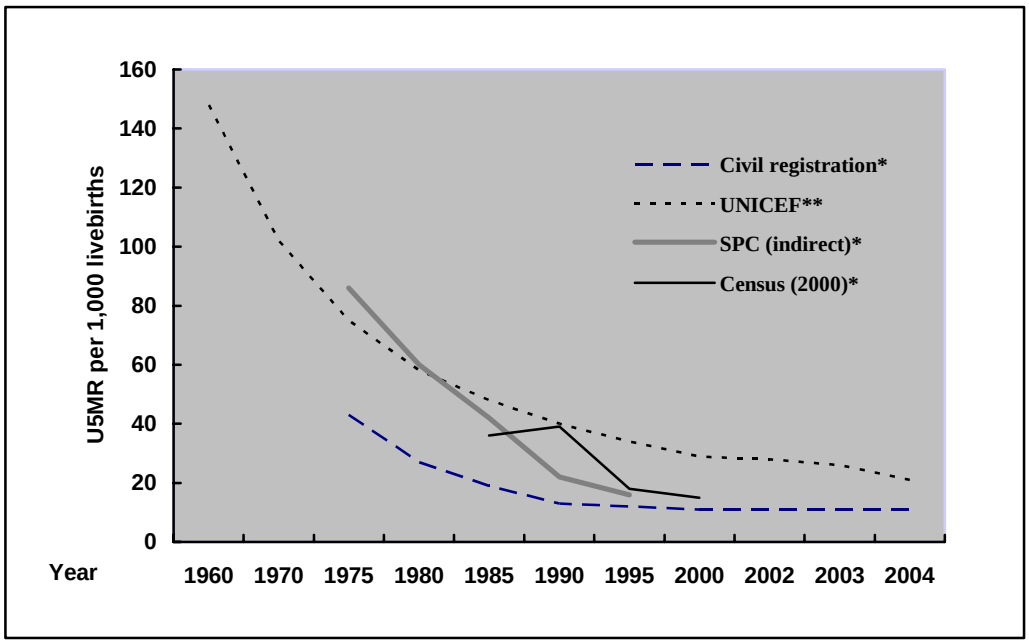


Figure 2.3 Estimation of U5MR from various sources of data

Source: * Kenneth Hill et al. 2006. Epidemiologic transition interrupted: a reassessment of mortality trends in Thailand, 1980–2000. *International Journal of Epidemiology*. Dec 20.

** UNICEF. 2006. Under-five mortality rate [cited 2007-03-04]. Available from: http://www.childinfo.org/areas/childmortality/u5data.php

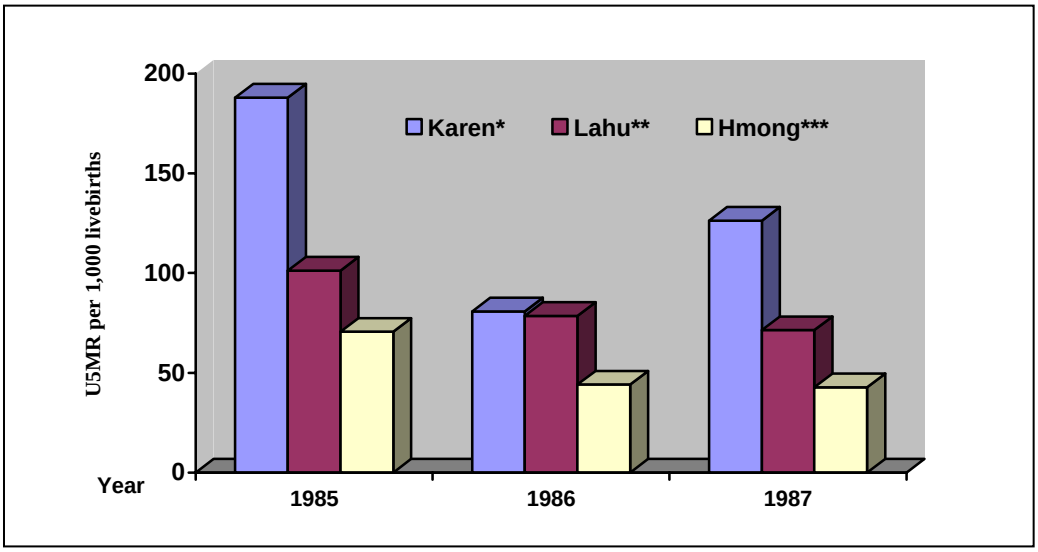


Figure 2.4 Under-five mortality rates among selected ethnic hilltribes

Note: * Tak, ** Chiangmai, *** Lampang

Source: Kanchanasinith, K and Porapakkham, Y. 1988. *The Study of Infant Mortality in Thailand 1988*. Institute for Population and Social Research, Mahidol University; Bangkok, Thailand.

As each ethnic group have distinct customs, behavior, environment, and accessibility to services, it worth identifying their unique U5MR in order to provide a better understanding of their child health situation. These knowledge can be lead to the achievement of the forth millennium goal.

2.6 Conceptual Framework

According to the literature review, ethnic affiliation could produce variation in personal behavior, socioeconomic opportunities, and health resource accessibility that affects to health status and mortality. Thus, a comparison on child mortality between ethnic groups was the stated purpose of this research. Along with the conceptual model proposed by Mosley and Chen (1984), child mortality among ethnic groups was investigate through socioeconomic determinants at community, household and individual levels and some proximate determinants were applied to explain inequalities in child mortality among studied ethnic groups. The conceptual framework of this study is illustrated as follow.

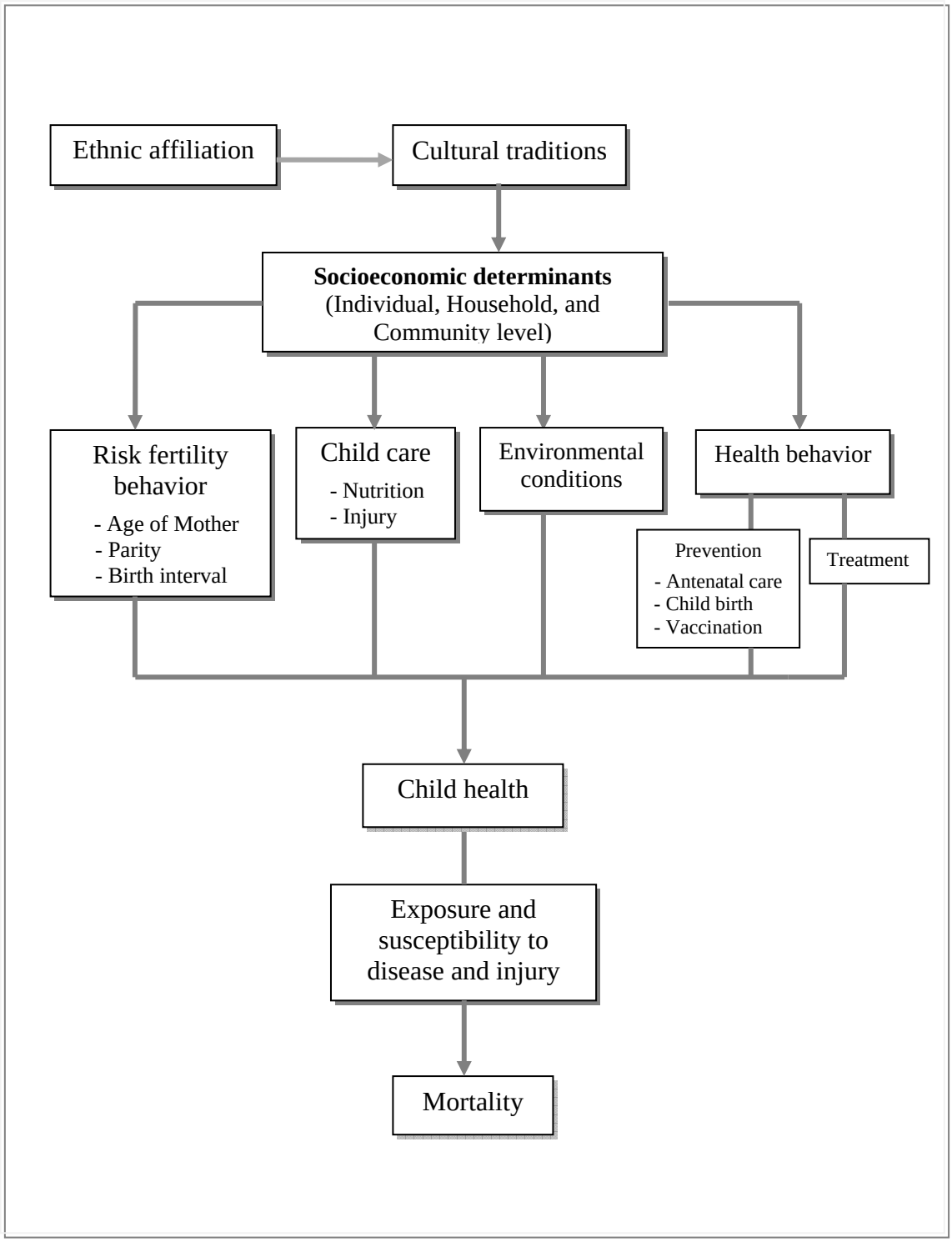


Figure 2.5 The conceptual framework

2.7 The Study Design

As a matter of the fact, mortality disparity among ethnic groups in Thailand has been rarely studied at the national level, so this study was designed to explore child mortality rates and mortality differentials at the national level as much data availability allows. Thus, under-five mortality rates among nine ethnic groups were explored using a national census. Unfortunately, for investigation of the factors contributing to inequality in child mortality, this source of data was not provided for statistical analysis. It offered only data on socioeconomic status of a household that could be used to investigate inequalities in child mortality. Therefore, other factors in the conceptual framework which were unavailable in the national census were explored at small scale, village level, through qualitative method.

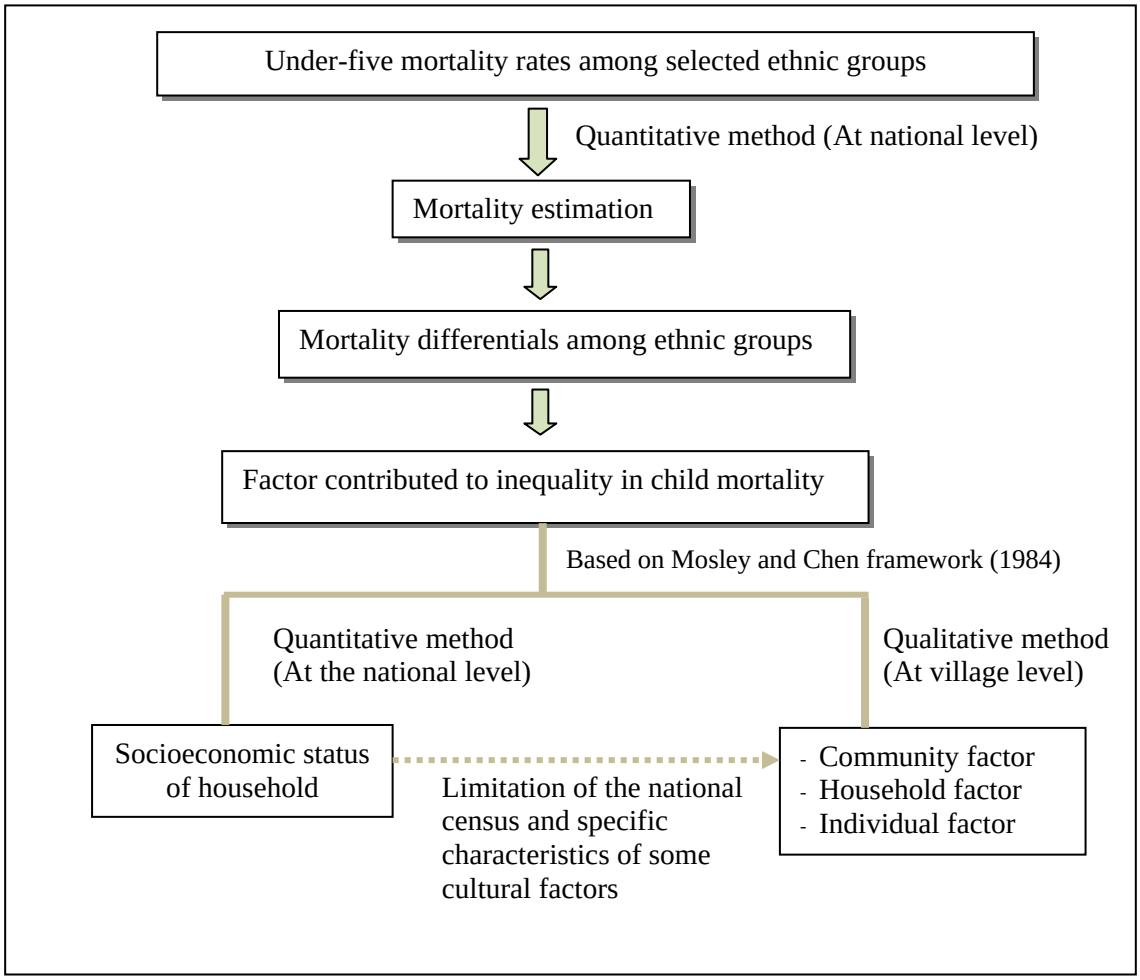


Figure 2.6 Diagram of study design

CHAPTER III
CHILD MORTALITY DIFFERENCES AMOMG ETHNIC GROUPS IN THAILAND: QUANTITATIVE STUDY

3.1 Introduction

A growing body of evidences throughout the world indicates the occurrence of socioeconomic inequalities in health both within and across countries. People at a socioeconomic disadvantage are more likely to have high morbidity and mortality rates than their better-off counterparts (Buor, 2003; Brokerhoff and Hewett, 2000; Wagstaff, 2000). As a consequence most socioeconomic inequalities in health have been considered an injustice or unfair and the burden of health problems in disadvantaged groups can be yield a great potential effect on the average health status of the population as a whole. Therefore, reducing socioeconomic inequalities between advantaged and disadvantaged groups has become a principal goal of several national governments and international organizations, including the World Bank and World Health Organization (Abbasi, 1999; Almeida et al, 2001).

The existence of socioeconomic inequalities in child mortality is documented by many studies (Hosseinpoor, et al., 2005; Mwageni, et al., 2005; Nathan, et al., 2005; Schulpen, Steenbergen, and Driel, 2001). The relationship between socioeconomic status and child mortality is strongly significant, with a high mortality rate frequently concentrated in the worse-off. These inequalities exist by all measures of socioeconomic position; household wealth or income, maternal education, occupational class in the household, as well as geographical setting.

Furthermore, substantial inequalities in child mortality between ethnic groups exist in many countries (Nepomnyaschy, 2006; Braveman, et al., 2001). Various studies reveal that the strength of the relation between socioeconomic status and

mortality varied between ethnic groups (Franklin, Stockwell, and Balistreri, 2006; Burgard and Treiman, 2004). This would have consequences for the extent to which socioeconomic inequalities may cause ethnic differences in mortality. To this extent, reducing disparities in health status and health care between racial/ethnic groups has recently become a vital concern.

Despite decades of rapid development, many groups in Thailand have been left behind, particularly ethnic minorities, migrants, refugees and the very poor (UNICEF, 2007). Thailand means to improve inequalities in child mortality in certain ethnic minorities that have high mortality rates in excess of the target. A prerequisite for achieving this goal is to establish how large these differences are. Unfortunately, in Thailand there are few studies exploring the relationship between SES and child Mortality and offering pragmatic explanations (Cleland, Bicego, and Fegan, 1992). Moreover, research on how these relationships differ across racial and ethnic groups has been scant.

This part of the study aims to explore levels and trends of child mortality in national level among eight relatively large sub-ethnic groups together with the major Thai. The size of socioeconomic inequalities in under-five mortality both within and between these ethnic groups was estimated by making use of information from the national census. According to this study the gap of disparities can be used to rank studied ethnic groups in terms of their “importance” in regard to policy attention to reduce mortality inequalities.

3.2 The Theoretical Background

3.2.1 Conceptions of Socioeconomic Status

Socioeconomic status (abbreviated here as SES) have many dimensions and measured in multiple ways. It can be generally conceptualized as an individual’s position (or the person's family or household) within a system of the distribution of social, cultural, and economic resources. The scope of SES is covered more than economic well-being or educational achievement, which are frequently used as

indicators in various studies; more broadly, it includes a lifetime of access to knowledge, opportunities, and resources. (Crimmins, et al., 2004).

Recent concept was proposed by Oakes and Rossi (2003), they define SES as differential access (realized and potential) to desired resources revealed in three domains called *material capital, human capital*, and *social capital*. As the extent of their view, SES may thus be defined as not only a measure of access to resources but also as a function of (1) material endowments (e.g., earned income, real property, and other changeable goods), (2) skills, abilities and knowledge, and (3) one's social network and the status, power, and abilities of its members. For example, income represents recent accumulation of material capital while wealth accumulation represents total material capital. Education represents human and social capital at the beginning of life.

SES is widely used as a proxy for social class in studies that examine variations in the distribution of disease, and it remains a determinant and pervasive predictor of variations in rates of morbidity and mortality (William and Collin, 1995).

3.2.2 Mechanisms Underlying SES and Ethnic Differential in Health

Substantial evidence exists to support the notion that SES is assumed as the root cause of differences among all populations. As people of different socioeconomic statuses are likely to differ in almost all aspects, such as childhood circumstances, educational attainment, occupation, neighborhood conditions, opportunities, or choices related to SES (Adler, et al., 1994). SES affects through health in a variety of mechanisms, including psychosocial factors, health behaviors, and health care (Anderson, 1995; Hummer, et al., 1998; Kington and Nickens, 2001). The influence of SES on health is initiated in early life, perhaps even in the prenatal setting, and continue to accumulate through life span, but the strength and nature of the relationship varies at different stages of the life course.

With regard to early childhood, the effect of SES on illness and death is much based on parents and household circumstances. Socioeconomic status of families is

extremely critical for attributing advantage or disadvantage on children at the beginning of their life. Mechanisms related to family affairs, housing characteristics, and childcare practices that are associated with SES. In addition, SES appears to come into play with a strong health protection such as, prenatal care, and immunization. Children of higher SES are more likely to grow up in families with better nutrition, fewer health risk behaviors, safer neighborhoods, and more economic resources. They tend to less expose to health threatening and have more resource to protect health threats, whereas children of lower SES experience higher rates of all-cause mortality and poor health (Defo, 1997; Barrett and Browne, 1996). These patterns occur whether SES is measured by education, occupation, income, or housing conditions.

Numerous studies reveal that parent's education is the one indicator of SES affected to child health and mortality. For example, the analysis of micro data in Brazil shows that the major declines in under-five mortality associated with substantial improvements in maternal education (Sastry, 2002). Analogous to the findings from Ghana (Buor, 2003) and New Zeland (Shaw, et al., 2005), mother's education has a significant impact on childhood morbidity and mortality.

Household income or household wealth is also seen to have a highly significant impact on the probability of poor health and death. Zere and McIntyre (2003) found that children in low economic household tended to be stunt an underweight. Likewise, Hong, Banta, and Betancourt (2006) indicate that children in the poorest 20% of households are more than three time as likely to suffer from adverse growth rate stunting as children from the wealthiest 20% of households. In cross-countries, the study in Sub-Saharan Africa shows that children from the poorest households stand greater risk to be undernourished than their counterparts in the most privileged households (Fotso, 2006). Wagstaff (2000) conducted the study in nine developing countries. The results reveal that there was a large gap of infant and under-five mortality between the bottom quintile and the rest of the population in many countries.

3.2.3 Ethnicity and Socioeconomic Status: How SES Varies by Ethnicity?

Socioeconomic differences between ethnic groups are mostly accountable for the ethnic disparities in health outcomes**.** The racial and ethnic differences are

substantially concerned because SES differs drastically by race and ethnicity (Crimmins, et al., 2004). Generally, race relates genetic or biological predispositions to certain diseases, such as sickle cell disease which have high incidence among African American in the United State (Wethers, 2000). However, rarely studies investigated the relationship between SES and inherited disease. There were only the studies on the SES allied to IQ score of children who were born either to biological parents of high SES or to parents of low SES (Capron and Duyme, 1989; Jenson, 1998a). Nevertheless, the role of SES on race and ethnicity is plausible to elucidate by cultural perspective. This point of view emphasizes on racial and ethnic identity that is a crucial part of personal identity which correlated to ways of behaving and reacting to the social environment that have implications for social position, economic resources and health status. Since groups differ in their social standing, their socioeconomic status may vary. Thus, groups are not always treated equally; some may experience more optimistic environments for health while others may not (Bulatao, 2004).

Moreover, a growing body of theoretical and empirical work suggests that racism or discrimination is a vital determinant of the health status of racial and ethnic populations (Williams, Neighbors, and Jackson, 2003). The experience of racial and ethnic prejudice leads to poor psychological and physiological effects, and restrictive the quantity and quality of health care received as well (Smith and Kington, 1997). Furthermore, race and ethnicity remain an important factor in residential patterns in the United States (Keeler, et al., 2002). Area of residence affects certain health-related factors such as environmental pollution, distance to health facilities, and health service availabilities.

Many studies reveal that the ethnic gap in health is concentrated at the low end of the socioeconomic quintile, and strongest among persons with the fewest socioeconomic possessions. More frequently, it is found that enhancement for SES substantially reduces morbidity and mortality among ethnic groups (Zere and McIntyre, 2003; Hong, Banta, and Betancourt, 2006)

Affiliated to ethnic minority of parents appears to influence the chances of survival of their children in early childhood. As note above, people who affiliated to

ethnic minority or marginalized groups lean to get disadvantages related to health in several ways. Base on an analysis of survey data among ethnic groups in a wide range of 11 African countries, Brockerhoff and Hewett (2000) revealed that there were large disparities in early child survival chances and ethnic mortality differences were closely linked to economic inequality in many countries. Additionally, there is much evidence correlated to socioeconomic differentials in child mortality among ethnic or racial group in the United States. Gaza, Stockwell, and Balistreri (2006) found that low income whites and non-white at all income levels have infant mortality rates substantially higher than the overall rate for the population. Matin and colleagues (2003) also noted that non-Hispanic black children are both more likely to have poor health outcomes and to be of lower SES than white children.

3.2.4 Measuring of Socioeconomic Status

According to the document review on existing measures of SES by Oakes and Rossi (2003), SES index has been conducted more than a half century, stemming from the index of Social Prestige (ISP), which was base upon occupation and education developed by Hollingshead in 1949. The most widely known American SES scale is Duncan's (1961), which classified occupations according to education and income. Then, there are many SES measurement in the later period, such as Nam-Powers occupational status scores (OSS) in 1965, a household prestige (HHP) score in 1974, Standard International Occupational Prestige Score (SIOPS), the Cambridge Scale (CS) in 1990, and the most recently is capital SES (CAPSES) proposed by Oakes and Rossi (2003).

Among a large number of SES measurement, the index of relative socioeconomic disadvantage (IRSD) developed by the Australian Bureau of Statistic (Gray and Auld, 2000) is the most remarkable measure for ethnic minorities. This measurement aims to estimate variation in socioeconomic status, particularly with respect to Indigenous Australians (Aborigine) between geographic regions. The measurement yields the understanding of variations in the socioeconomic status among indigenous peoples that is important when developing policies aimed to reduce the level of ethnic minority disadvantage.

(a) Socioeconomic Indicators

In studies of the mortality-socioeconomic status nexus in early childhood, many indicators have typically been used as proxies. Even though each indicator used for SES measure tends to be related to health outcomes, its measure has own set of advantage and limitations. The briefly discuss some of the major items that frequently arise to use as a proxy of SES are described below.

Financial Resources Most studies in mortality differential have measured financial resources with some form of individual or household consumption and income. However, numerous scholars deliberate various problems appeared with the measure of income (Williams and Collins, 1995; Ferguson, et al., 2003; Heaton, et al., 2005). Income information may be particularly sensitive for some groups and unstable than other SES indicators; education or occupation. As the dynamic nature, income fluctuates yearly according to such factors, for instance, the household's employment and agriculture products (Deaton and Zaidi, 2000). Also, some people might report over or under the real figures of income (Minujin and Delamonica, 2001). In the context of developing countries, the use of income as a measure of financial resources asserts considerable problems in both unavailable and unreliable of data (Montgomery, et al., 2000; Bollen, Glanville, and Stecklov, 2001). In addition, a large part of population works in self-subsistence agriculture or informal sector and may not receive cash payment for their work (Houweling, Kunst, and Mackenbach, 2003).

Therefore, the other SES indicators have been proposed to detain an important dimension of financial resources, such as permanent income or wealth. These indicators may signify to long-run income and may be more strongly linked to social position than earned income (Filmer and Pritchett, 2001; Gwatkin, et al., 2000). Household asset or durable goods typically use as proxies for income and wealth.

For understanding ethnic health disparities, permanent income may be decisive than income because ethnic differences in wealth are even greater than income (Machenbach and Kunst, 1997). Moreover, the same amount of incomes may not be

actually equal because each group does not translate into the same purchasing power in different communities (Williams and Collins, 1995).

Housing Condition and Sanitary Conditions Another factor strongly linked to SES is the physical environment that is often estimated using housing characteristics and sanitary conditions (Adler and Newman, 2002; Evans and Kantrowitz, 2002). In relation to World Health Organization, housing conditions is related to health and well being as well as economic status. Poor housing is usually defined in terms of overcrowding, number of room, and constructing with non-permanent or reused materials. While, sanitary conditions are mainly focused on water supply, drinking water, toilet, and electricity.

Education Educational achievement is usually considered as a good proxy to social position and a robust indicator of inequalities. Education may affect health and mortality through various pathways. Level of education is a crucial determinant of economic status. It determines labor market opportunities for earning income and the capability to access economic resources. Furthermore, educational attainment may be related to the efficiency of health production—that is, better-educated individuals may have more health information, health investments, and healthy habits than those of lower education (Smith and Kington, 1997). However, the vague measurement of education may be occurred when race or ethnicity is included to the relationship because there have been large differences in the content and quality of education among races or ethnicities. The levels of education may not reveal the same levels of knowledge and skills (Williams and Collins, 1995).

Occupation Most scholars commonly used occupation as an indicator of socioeconomic status (Cleland, Bicego, and Fegan, 1992; Nepomnyaschy, 2006; Shaw, et al., 2005). Since, it considers a better measure of long-run economic status than income which is represented to SES only at a single point in time. Nevertheless, some problems may arise on the interpretation of occupation. This indicator rather confines to labor market conditions, it is appropriate for the settings which become increasingly urban and industrialized (Bollen, Glanville, and Stecklov, 2001). Additionally, broad groupings of occupation may not capture significant variation

within occupational categories. Furthermore, there are some other problems when compare occupation across racial and ethnic groups with different status rankings of occupations. In relation to racial or ethnic composition in the community, a particular occupation may translate into a different status (Smith and Kington, 1997).

(b) The Analyses for SES Index

The analyses for SES index construction have been proposed in a great number ranging form the simple to the complex methods. A brief review of selected three contemporary and widely known methods of analysis is described below.

Principal Components Analysis **(PCA)** is one of the extraction methods which have been used to derive individual weights for items in the construction of wealth index. It is designed to capture the variance in a dataset in terms of principal components. This one has been accepted as efficiency item reduction methods but there are some argument about its limitation, such as inappropriate to compare the results across countries and do not provide the guidance for the future surveys.

The Dichotomous Hierarchical Ordered Probit Model **(DIHOPIT)** The model was initially developed to enhance the cross-population comparability by basing on the variant of the probit model. This method produces a series of indicator-specific cut-points on a latent scale. The values above cut-points represent that respondents are more likely to respond positively than not. The advantage of this method are (1) the set of indicator variables need not be the same across populations, (2) it can be directly compared across countries, and (3) it is useful for item reduction for the future surveys.

Rapid Rural Appraisal **(RRA)** is a qualitative approach for stratifying households into wealth groups. This method typically involves to fieldwork for asking a small group of respondents to an ordinal ranking of households in a village by total wealth. The total wealth-ranking approach seems culturally appropriate criteria of wealth because respondents can value the objects with local weights. This method is considered as effective method for capturing wealth difference among rural

populations and low cost method. However, the wealth ranking technique still debates on validity. RRA is inappropriate to compare the results across populations.

3.3 Specific Objectives and Research Hypotheses

The Specific Objectives of the Study

(1) To estimate levels and trends of child mortality among nine selected ethnic groups in Thailand and compare disparities of child mortality among selected ethnic minorities with general Thai

(2) To estimate child mortality across socioeconomic groups within and between ethnic groups

(3) To assess the magnitude of child mortality inequalities among ethnic groups across socioeconomic groups

Hypotheses

(1) Mortality levels and trends among general Thai and selected ethnic minorities are different.

(2) Among ethnic groups, people with lower socioeconomic status experience higher mortality rates than those of higher socioeconomic status.

(3) The magnitude of child mortality inequality in Thai is smaller than ethnic minorities

3.4 Operational Definition

The main terms used in this study defined as follows:

Ethnic group: Conventionally, it is defined as a group of people recognized as a class based on certain distinctive characteristics such as religion, language, ancestry, culture or national origin. The 2000 population and housing census do not provide information on race or ethnicity. However, language can be used as a proxy for ethnicity (Gill, et al., 2007). For this study, ethnic affiliation was identified by language usually spoken in a household.

Under-five mortality rate is the probability of dying of a child born in a specified year dying before reaching the age of five. It is expressed as the number of deaths under five years of age per 1,000 livebirths per annum.

3.5 Methodology

The quantitative method was utilized to estimate under-five mortality rate, construct the index of socioeconomic status, and estimate under-five mortality rates in each quartile of socioeconomic status of each ethnic group as well as calculate child mortality rate ratios by using secondary data. All procedures are demonstrated in figure 2.1

3.5.1 Data set

There is a limited of data on ethnic groups in Thailand, especially mortality data. However, there are the Surveys of the Hill Tribe Population conducted by the National Statistic Office in 1985, 1986, and 1987. These surveys envelop the 100 percent enumeration of all hilltribe persons and households and comprise of three categories of data: community data, individual data, and household data. However, these sources of data are outdated. Recently, Highland Health Development Center has conducted surveys on the health status of hilltribe peoples since 1993. Even if this survey focused on maternal and child health, and risk health behavior in adolescent and adulthood, the data on child mortality is unavailable. Fortunately, the data on children death among ethnic groups can be drawn out from the national census by using the indirect demographic techniques. The source of data used in this study is as described bellows.

The Population and Housing Census

The population census was conducted in Thailand since 1909 by the Ministry of Interior followed by four subsequent censuses in 1919, 1929, 1937 and 1947. Since 1960, the census has been conducted every ten years and the responsibility for undertaking population censuses has been accountable by the National Statistical Office (NSO). For the purpose of international comparison recommended by the United Nations, the national census has undertaken in the year ending with 0 (zero).

Since then, Thailand has conducted its census in 1970, 1980, 1990, and 2000. The first housing census was conducted simultaneously with the population census in 1970. The 2000 population and housing census is the tenth population census and fourth housing census of Thailand. The census provides a comprehensive update of the information on the major characteristics of population and housing at the national and sub-national. Population included in the census coverage are all Thai nationals residing in the country as of the census date (1st of April) and persons having their usual residence in Thailand including civilian citizens of foreign countries, but hilltribes having no permanent place of residence and refugees or illegal immigrants located in camps provided by the government were not included.

The data on ethnic groups as a figure for the whole country can be obtained from censuses. Even if the ethnicity is unavailable directly on this source of data, it can be identified from the data on language usually spoken in the household. There are about 21 languages including Thai collected in the census. As this variable was collected at the household level, the ethnicity is attributed to all members of the household. However, there are only 2 recent rounds, 1990 and 2000 from which the spoken languages are accessible. The latest round was selected for this study.

This source of data is needed for under-five mortality rate (U5MR) estimation and socioeconomic index construction. The data on death is not recorded in the population and housing census, but the estimates of under-five mortality were based on retrospective information collected from women interviewed in 2000, on the number of children they had ever born and the number of living children, classified by the age of the women by using the indirect technique.

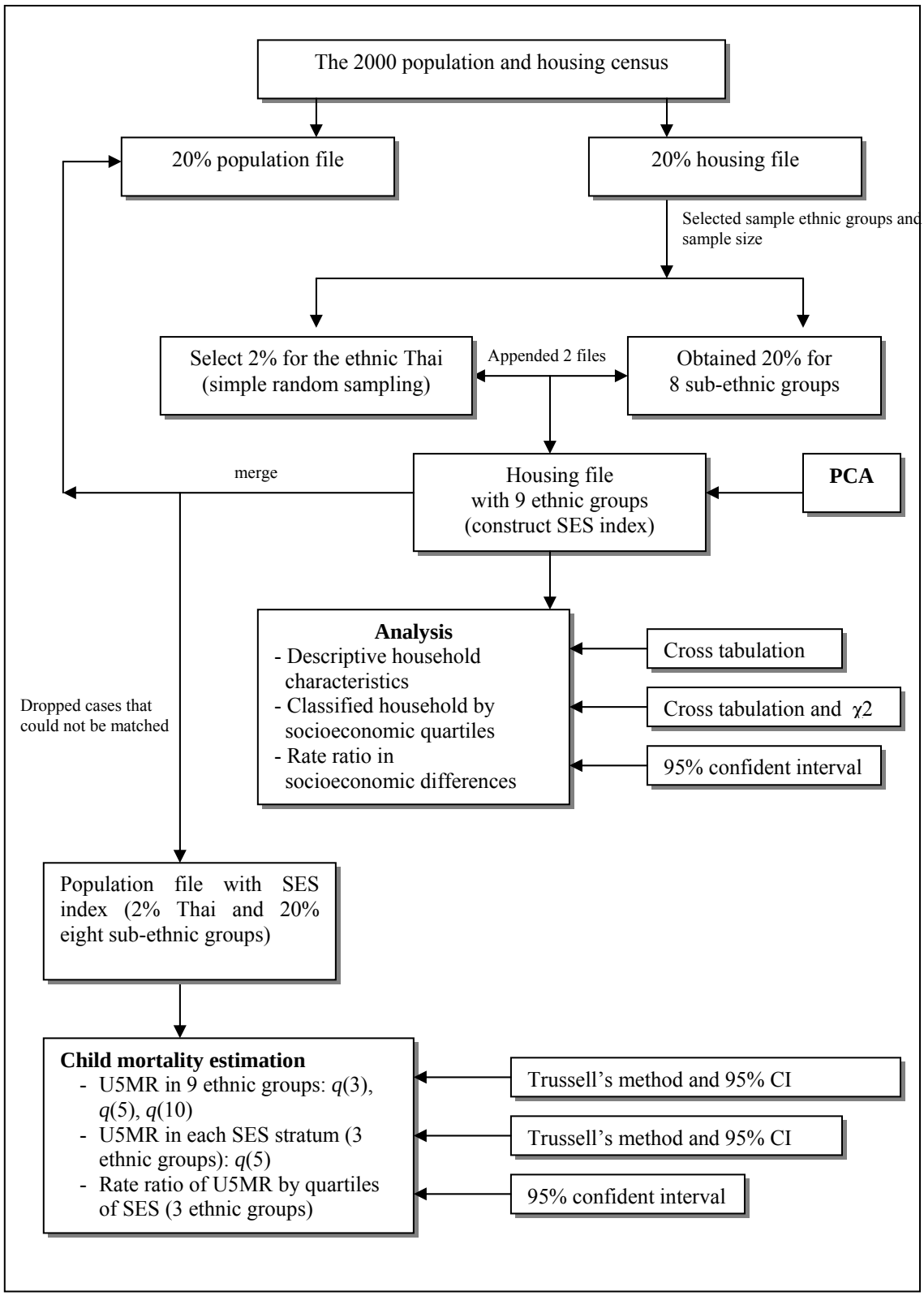


Figure 3.1 Diagram of the study on inequality of under-five mortality among ethnic groups in Thailand

3.5.2 Sample selection

According to available data on language, it is reasonable to assume that there are about 21 ethnic groups included in the 2000 population and housing census. To have sufficient numbers of deaths for estimating under-five mortality rate, and to illustrate a variety of ethnicity in Thailand, eight sub-ethnic groups comprised of Chinese, Malay, Khmer (Suay), Mon, Karen, Hmong, Lahu, and Akha with at least 2,000 households, together with the major Thai were selected as samples.

The methodology operating the 2000 census was that all persons and households were listed and simultaneously enumerated with a short form questionnaire except for the sample households (20% for Bangkok, municipal and non-municipal areas) which were enumerated with a long form questionnaire. Because the proportion of sub-ethnic groups under study was much smaller than Thai, the sample size of these groups had to be large enough to yield reliable results. Therefore, 20% of the 2000 population and housing census (all records from the long form questionnaire) were applied to 8 sub-ethnic groups, whereas, only 2 percent for sufficiently large cases was employed for estimates of the major Thai (see Table 3.1).

Table 3.1 Sample size of Thai and eight sub-ethnic groups from the 2000 Census

Ethnicity	Sample size	
	Number of households	Number of woman aged 15-49 years
Thai	307 373	315 058
Chinese	9 091	15 856
Malay	53 267	67 212
Khmer	70 564	75 978
Mon	5 929	6 196
Karen	15 550	18 400
Hmong	4 246	5 493
Lahu	3 447	4 197
Akha	2 450	3 023

3.5.3 Quality of Data

Thailand, like other developing countries, does not heavily concern on a complete and reliable system of civil registration of births and deaths among ethnic minorities. Thus, this study is based on retrospective survey data on the 'number of children ever born and number of surviving' often contain recall errors. Table 3.2 displays data on the mean number of children ever born, mean number of living children, and mean number of children dead classified by age group of women across 9 ethnic groups.

There is evidence that the mean number of children ever born, mean number of alive, and mean number of dead increased consistently with the age of women in nearly all ethnic groups. This indicates that the reports of fertility and deceased child experience of the women appear somewhat accurate. For example, Malay, the mean number of children ever born rose from 0.061 for women aged 15-19 years to 3.315 for women aged 45-49 years, whereas the mean number of children dead increased from 0.003 for first age group to 0.189 for the last age group. However, for Hmong and Akha, the mean number of children ever born and the mean number of alive for women aged 45-49 years were smaller than the former age group and the mean number of dead for Chinese women aged 20-24 years was slightly greater than the two subsequent age groups. Likewise, the mean number of dead for Mon women aged 40-44 was slightly lower than the previous age group.

Table 3.2 Mean number of children ever born and mean number of living children of 9 ethnic groups, the 2000 population and housing census

Age of women	No of women	Mean no. of CEB	Mean no. of living children	Mean no. of children dead
Thai				
15-49	46 842	0.044	0.044	0.000
20-24	41 214	0.372	0.364	0.007
25-29	45 807	0.894	0.882	0.012
30-34	50 583	1.331	1.310	0.021
35-39	49 408	1.637	1.603	0.034
40-44	44 965	1.866	1.814	0.052
45-49	36 239	2.178	2.085	0.093
Total	315 058	1.172	1.143	0.030
Chinese				
15-19	2 159	0.035	0.034	0.000
20-24	2 355	0.186	0.177	0.009
25-29	2 200	0.425	0.423	0.003
30-34	2 400	0.802	0.796	0.006
35-39	2 365	1.153	1.141	0.011
40-44	2 412	1.393	1.354	0.038
45-49	1 965	1.745	1.705	0.040
Total	15 856	0.813	0.798	0.015
Malay				
15-19	13 218	0.061	0.058	0.003
20-24	11 721	0.523	0.509	0.014
25-29	10 847	1.322	1.286	0.036
30-34	9 868	2.116	2.058	0.058
35-39	9 118	2.706	2.628	0.078
40-44	6 705	3.118	2.974	0.144
45-49	5 735	3.315	3.126	0.189
Total	67 212	1.588	1.530	0.059

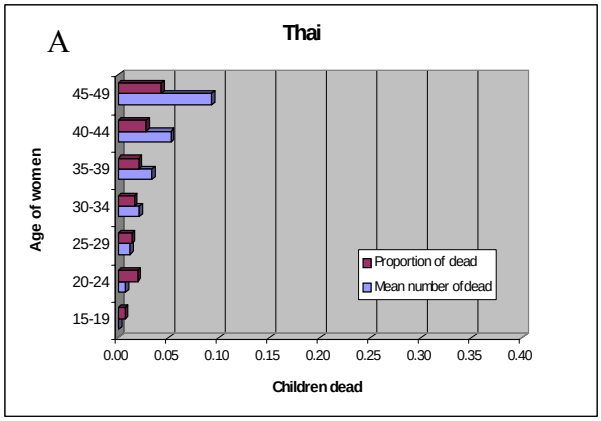
Table 3.2 Mean number of children ever born and mean number of living children of 9 ethnic groups, the 2000 population and housing census (cont.)

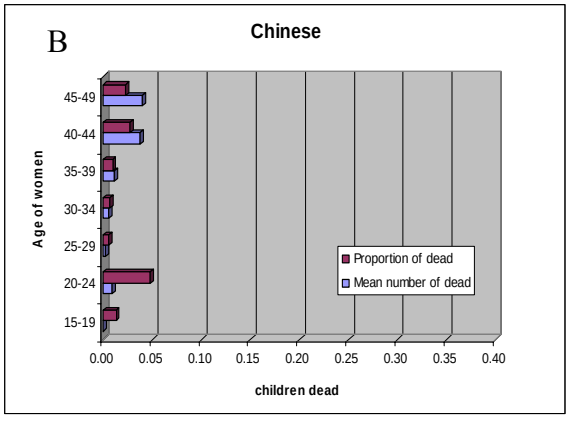
Age of women	No of women	Mean no. of CEB	Mean no. of living children	Mean no. of children dead
Khmer				
15-19	12 696	0.054	0.054	0.000
20-24	9 112	0.515	0.508	0.007
25-29	11 054	1.200	1.180	0.020
30-34	12 067	1.805	1.767	0.038
35-39	12 101	2.184	2.131	0.053
40-44	10 403	2.527	2.410	0.117
45-49	8 545	2.903	2.749	0.154
Total	75 978	1.552	1.501	0.052
Mon				
15-49	910	0.121	0.118	0.003
20-24	1 480	0.430	0.424	0.006
25-29	1 211	0.862	0.853	0.009
30-34	891	1.420	1.385	0.035
35-39	731	1.759	1.685	0.074
40-44	580	2.155	2.084	0.071
45-49	393	2.262	2.130	0.132
Total	6 196	1.046	1.013	0.032
Karen				
15-49	3 314	0.160	0.155	0.005
20-24	3 184	0.920	0.892	0.029
25-29	3 129	1.625	1.560	0.065
30-34	2 975	2.159	2.042	0.117
35-39	2 304	2.526	2.365	0.161
40-44	2 024	2.863	2.633	0.230
45-49	1 470	3.246	2.888	0.357
Total	18 400	1.704	1.594	0.110

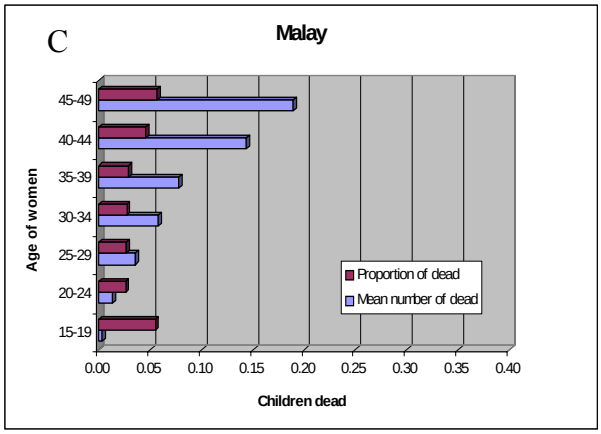
Table 3.2 Mean number of children ever born and mean number of living children of 9 ethnic groups, the 2000 population and housing census (cont.)

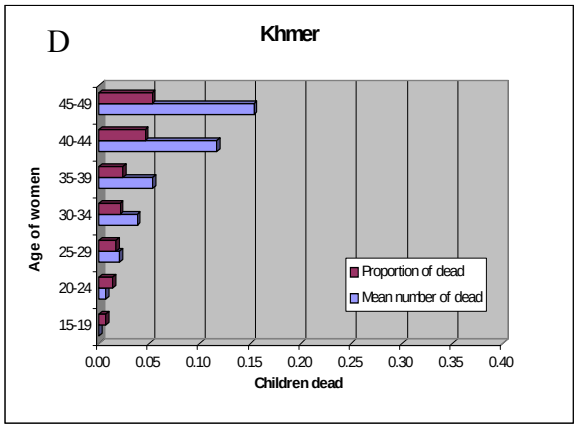
Age of women	No of women	Mean no. of CEB	Mean no. of living children	Mean no. of children dead
Hmong				
15-49	1 409	0.304	0.302	0.003
20-24	1 034	1.352	1.330	0.022
25-29	805	2.671	2.619	0.052
30-34	785	3.625	3.516	0.110
35-39	585	3.974	3.856	0.118
40-44	522	4.464	4.249	0.215
45-49	353	4.450	4.133	0.317
Total	5 493	2.376	2.294	0.082
Lahu				
15-49	878	0.173	0.165	0.008
20-24	743	0.884	0.865	0.019
25-29	645	1.589	1.498	0.091
30-34	674	2.294	2.180	0.114
35-39	537	2.825	2.616	0.209
40-44	423	3.210	2.950	0.260
45-49	297	3.279	2.923	0.357
Total	4 197	1.722	1.607	0.116
Akha				
15-49	615	0.117	0.114	0.003
20-24	508	0.614	0.583	0.031
25-29	471	1.374	1.340	0.034
30-34	448	2.152	2.080	0.071
35-39	408	2.652	2.537	0.115
40-44	331	3.085	2.900	0.184
45-49	242	2.810	2.554	0.256
Total	3 023	1.581	1.502	0.078

Although the mean number of children dead points to comparatively accurate, the proportion of children dead in Figure 3.2 (A-I) was inconsistency with age of women in various ethnic groups. These shortcomings imply that women in some age groups must misstate either the number of children ever born or the number of children dead or both, particularly in young age group. For the ethnic Thai, the figure 2.2 (A) implies higher cumulative child loss among women aged 20-24 years than older women aged 25-34, similarly in Chinese and Akha. On the other hand, the proportion of dead does not increase with age in older age group. For instance, the proportion of dead in Chinese women aged 45-49 was lower than younger age group, analogous to women aged 40-44 years in Mon, and 30-34 years in Lahu. These problems might be attributable to age misstatement of women or the number of children born or dead. It is plausible to conclude that this set of data have more defects in age groups 20-24, 40-44, and 45-49 years (the value for women aged 15-19 are conventionally ignored because it does not give indication of increasing omission of dead children as age rises (United Nations, 1983).









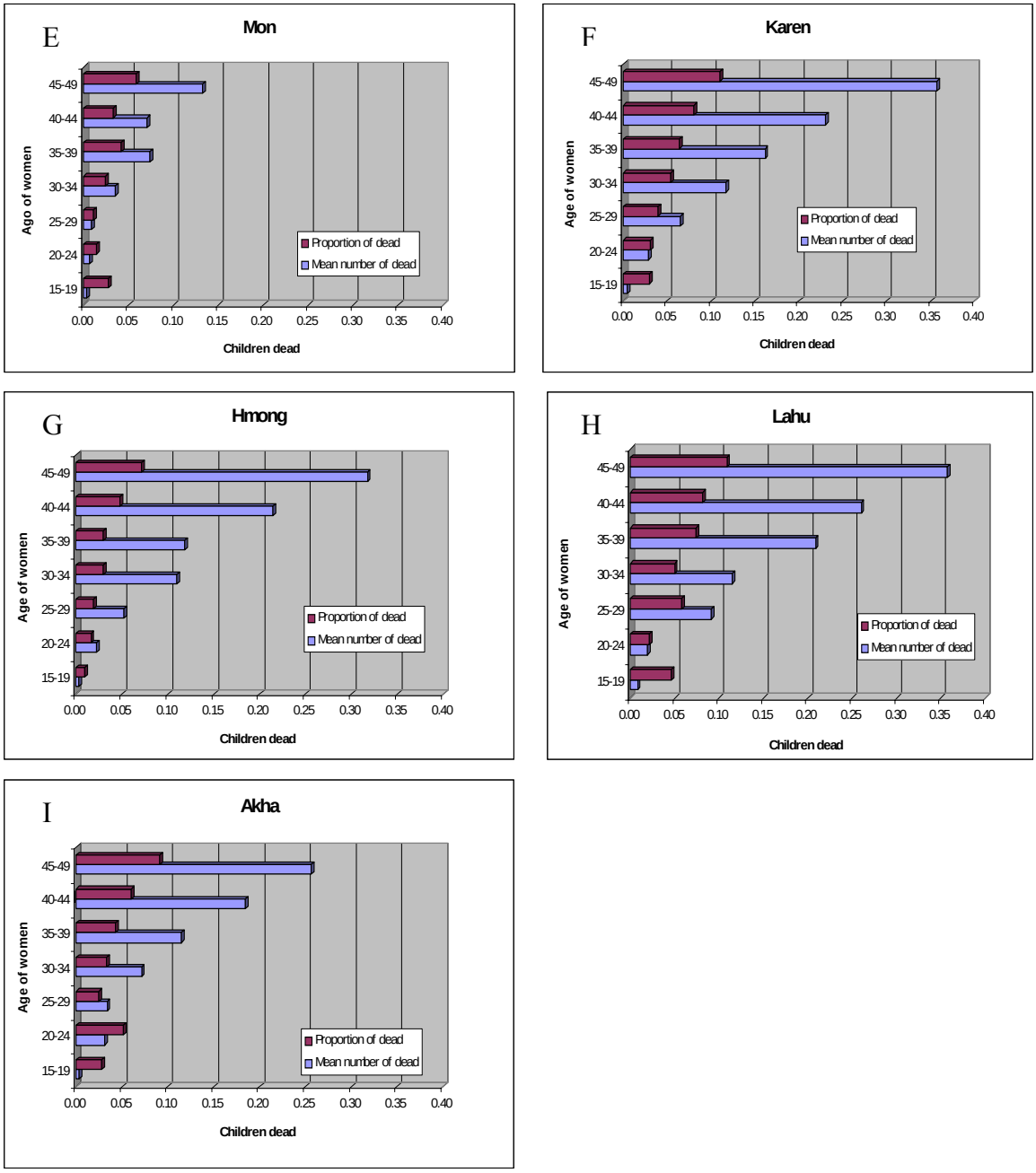


Figure 3.2 (A-I) Mean number and proportion of children dead according to age of women among 9 ethnic groups, the 2000 population and housing census

3.5.4 Measurement

3.5.4.1 Mortality Analysis

The Trussell method version of the original Brass estimation (United Nations, 1983) was used for estimation of child mortality using data classified by age. This indirect method is based on the concept of Brass; the proportions of children ever born who have died are indicators of child mortality and can yield robust estimates of childhood mortality. He developed a procedure for converting proportions dead of children ever born reported by women in age groups into estimates of the probability of dying before attaining certain exact childhood ages. The basic form of the estimation equation proposed by Brass is

$$q(x) = k(i)\, D(i)$$

where $q(x)$ is the probability of dying between birth and exact age x

$D(i)$ is the proportion dead among children ever born to women in age group i

$k(i)$ is multipliers for adjusting non-mortality factors determining the value of D(i)

Computational Procedure

The steps of the estimation comprised of 5 steps are as follows:

Calculation of average parity per woman. Average parities are calculated by dividing the number of children ever born by the total number of women, that is,

$$P(i) = CEB(i) / FP(i)$$

where $P(i)$ is the average parity of women in age group i

$CEB(i)$ is the number of children ever borne by women in age group i

$FP(i)$ is the total number of women in age group i

Calculation of proportion of children dead for each age group of mother. This proportion is estimated by dividing the number of children dead by the children ever born, Thus

$$D(i) = CD(i) / CEB(i)$$

where $D(i)$ is the proportion of children dead of women in age group i
$CEB(i)$ is the number of children ever borne by women in age group i

Calculation of multipliers. Trusell estimated a set of multipliers by using least squares regression to data produced from the model fertility schedule developed by Coale and Trussell. The coefficients for estimate the multipliers are provided in different set according to four regional Coale-Demeny mortality models (United Nations, 1983: 77). The multipliers are needed to adjust of the reported proportion dead for the effects of the age pattern of childbearing. The estimation equation is expressed below,

$$K(i) = a(i) + b(i)(P(1)/P(2)) + c(i)\,(P(2)/P(3))$$

where $K(i)$ is the multipliers
$a(i), b(i), c(i)$ refer to coefficient in different set of women in age group i
$P(1)$ refers to women in age group 15-19
$P(2)$ refers to women in age group 20-24
$P(3)$ refers to women in age group 25-29

Calculation of probabilities of dying and of surviving. Estimates of the probability of dying, $q(x)$, are obtained for different values of exact age x as the product of the reported proportions dead, $D(i)$, and the corresponding multipliers, $K(i)$. The probability of surviving from birth to exact age x, can be obtained from $l(x) = 1.0\text{-}q(x)$

Calculation of reference period. The estimate of the time reference to which the estimates refer is required. The reference period, $t(x)$, is an estimate of the number of year before the survey date to which the child mortality estimates, $q(x)$ by using the ratios $(P(1)/P(2))$ and $(P(2)/P(3))$ in the previous step and the values of the coefficients (United Nations, 1983: 78), the estimation equation is

$$T(x) = a(i) + b(i)(P(1)/P(2)) + c(i)\,(P(2)/P(3))$$

where $T(x)$ is the reference period corresponding to women in age group i

$a(i), b(i), c(i)$ refer to coefficient for estimation of reference period in different set of women in age group i

$P(1), P(2), P(3)$ refers to women in different age group as above

Adjusting the mortality estimates. In order to exploring the consistency of the mortality estimates, the final step is required to convert them into mortality levels in any mortality model that is most consistent with the age pattern of mortality in the population being investigated, the five United Nations mortality models or the four regional Coale-Demeny mortality models.

According to several studies in Thailand on child mortality estimation by both direct and indirect methods using various sources of data (Vapattanawong, et al., 2007; Hill, et al., 2006, Hill, 1995), the West model of the Coale-Demeny family of life tables was the most appropriate model for Thailand. Therefore, this model was selected as the most reasonable approximation to the age pattern of child mortality for this study. Even if the study involved with ethnic minorities which have high levels of child mortality, 'West model' is still seemed to proper for estimations rather than other families. Because of this model is developed from the largest number and broadest variety of cases, it is presumed to represent the most general mortality pattern (United Nations, 1983).

This method yields estimates of $q(1)$, $q(2)$, $q(3)$, $q(5)$, $q(10)$, $q(15)$, and $q(20)$ and generates probabilities of dying from birth to different ages in childhood by basing on the assumption that fertility and childhood mortality have remained constant in the recent past. The risk of child dead is based only on child's age and not on other factors, such as birth order or mother's age. Estimates for each age group of women refer to an approximate reference period as below:

- Estimates based on women aged 15-19 refer to the period 1 year before the survey, $q(1)$
- Estimates based on women aged 20-24 refer to the period 2 years before the survey, $q(2)$
- Estimates based on women aged 25-29 refer to the period 3 years before the survey, $q(3)$
- Estimates based on women aged 30-34 refer to the period 5 years before the survey, $q(5)$

- Estimates based on women aged 35-39 refer to the period 10 years before the survey, $q(10)$
- Estimates based on women aged 40-44 refer to the period 15 years before the survey, $q(15)$
- Estimates based on women aged 45-49 refer to the period 20 years before the survey, $q(20)$

This study selected only probability of dying yielded from women aged 25-39 years ($q(3)$, $q(5)$, $q(10)$, on average, to periods approximately 5, 8 and 11 years before the date of the 2000 census for display levels and trends among 9 ethnic groups. The value for age group 15-19, 20-24, 40-44, and 45-49 were excluded because of quality of data and some reasons in relation to too young and too old women. Children of teenage mothers usually face higher mortality. For this reason, it might be due to physiological factors associated with the physical immaturity, inexperience, and social capital deficiency of young mothers. In addition, in the case of pre-marital fertility in adolescent, they are often come across with difficulty in access to child care resources and assistance from their husbands or from their husband's family because of their unmarried status. Moreover, the reported number of children ever born and dead by teenager mothers tend to lower than actuality, thus the estimates based on these age group are usually fluctuated. For older age groups, the data frequently presents lots of defect because of their memory. Older women tend to omit some of their live-born children, particularly those living in other household and those who have died. The proportion omitted tends to increase with age of mother (United Nations, 1983).

3.5.4.2 Estimation of Standard Error in U5MR

Simple Variance Estimate proposed by Mendoza and Kalsbeek (1983) was employed to estimate standard errors in U5MR. They applied multiplicative factor which is a linear function of the estimated parity ratio generated by Sullivan and Trussell as the adjustments. The indirect estimates is obtained the general form as

$$\boxed{\text{var}_x(\theta) \quad = \quad k_i^{\,2} D_i(1-D_i)/n_i}$$

where k_i is the constant coefficients to women in the *i-th* age group (calculate from step of child mortality estimation)

D_i is the proportion of death among children ever born to women in the *i-th* age group

n_i is the number of children ever born to women in the the *i-th* age group

3.5.4.3 Measurement of socioeconomic index

The index of socioeconomic status needs to take account of a range of factors that combine to determine socioeconomic status. The 2000 population and housing census do not provide income or consumption data but do have detailed information on land and household ownership, accessibility of a variety of consumer goods, and sanitary amenities. As state before, however, income is seemed to improper for investigating the influences of SES on mortality in developing countries and the study especially focusing on ethnicity. According to the literatures and availability of data, 15 variables can be recognized as a particular socioeconomic dimension for ethnic groups in Thailand. The selected variables refer to SES in three respects. First are variables regarding to household assets (e.g. television, radio, refrigerator, etc). The second is housing characteristics and the last contributes to sanitary amenities (e.g. water supply and toilet). All indicators of the socioeconomic status of the household were recoded and dichotomized. The detail of variable and its scale are described in Table 3.3

Table 3.3 Variable used for SES index construction

Variable	Scale measurement	
	1	0
Household asset contained 11 items of durable goods	Have	Not have
Household characteristic Material construction	Wholly or mainly use of permanent materials	Non-permanent or reused materials
Sanitation amenities		
Toilet	Flush latrine or molded bucket latrine	Pits/ waste disposed to river or canal and others/ no latrine
Water supply	Tab water inside or outside a household	Other sources (e.g. well, river, canal, stream, and rain water)
Cooking fuel	Electricity or gas	Others (e.g. charcoal, wood, and kerosene)

Though there are some arguments about an important of a conceptual distinction between indicator that work directly and indirectly on health when an explanatory analysis base on Mosley and Chen's framework. In such instances, for directly effects, some infections may exposure through unhygienic sanitary facilities and for distance determinants that work indirectly, such as household wealth (Bollen, Glanville, and stecklov, 2001). In relation to the arguments, the scholars encouraged to concern about this sensitivity and suggested to acquire indicator without direct determinants. To this extent, this study did not treat variables related to direct effect on health, such as toilet, water supply, and housing characteristics as hygienic or non-hygienic variables, but those of them are dedicated to financial ability. For household assets, durable consumer goods which are hardly accessible to anyone or given priority to rich household were selected to the analysis because they can be signify the socioeconomic of a household better than the items that most of people are likely to own (Houweling, Khunst and Mackenbach, 2003).

The statistical technique Principal Component Analysis (PCA) which is closely related to factor analysis was employed to estimate the indices of socioeconomic status. PCA is a technique used to summarize a number of related variables into a single index by reducing a number of related variables to a new set of components. Base on Filmer and Pritchett (1998), PCA was applied for determine the weights for an index of the socioeconomic variables. The result of principal components is an SES index for each household (*Aj)* based on the formula:

$$A_j = f_1 (a_{ji}-a_1) / (S_1) + \ldots + f_N (a_{jN} - a_N) / S_N)$$

where f_{1-N} is the scoring factor or weights for the *i*-th variable (1 to N)

a_j is the *i*-th household value for the the *i*-th variable (1 to N)

a_{1-N} is the mean of the *i*-th variable (1 to N) over all households

S_{1-N} is the standard deviation of the *i*-th variable (1 to N) over all households

The first principal component was used to develop SES index. It explains 32.9 percent of the variation in the fifteen socioeconomic variables. Base on the constructed

indices, all households were classified into socioeconomic quartiles, that is, quartile 4 comprises a group with the highest scores (highest socioeconomic status) and quartile 1 comprises a group with the lowest score (lowest socioeconomic status).

Then, to acquire SES of each ethnic group, the households were assembled along with its ethnic affiliation. Simple cross-tabulations were utilized to explore the existence and magnitude of socioeconomic disparities among ethnic groups. Chi-squared tests are performed to assess the significance of these disparities. Once each ethnic group was classified into SES quartiles, the numbers of death in certain socioeconomic strata of various ethnic groups were very tiny and unreasonable to calculate. Hence, for accessing U5MR differentials across SES among ethnic groups, nine ethnic groups were pooled into three groups,[1] that are the ethnic Thai group, ethnic hilltribes (Mon was included to this group), and other ethnic groups (comprised of Chinese, Malay, and Khmer) as a means to obtain sufficient numbers of death for the estimations. U5MR of three clusters were based on women aged 30-34 years because the estimates provided from this group were more robust than the others.

The Reliability of the SES Index

The SES index for this study is seemed to verify in two respects as described below.

Internal coherence Table 3.4 shows the comparison of the percentage in each SES variable across households with lowest to the highest SES. The index generates clear differences across SES strata and the percent of ownership increased consistency with the privileged level of socioeconomic status in almost variables. In such stances, household asset, television ownership is 23.2 percent for the lowest SES versus 99.7 percent for the highest SES, and the highest possessed a car 60.0 percent while the lowest achieved only 1.0%. Even if the percentage of tractor and agricultural machine dropped in the highest group, they may possibly represented financial status for people in agricultural sector which is a large part of this country. The score on variables of materials in the dwelling and sanitation amenities are also show the clean

[1] Ethnic groups which have similar characteristics in terms of the percentage of household head with Thai nationality and the percentage of literate household head were combined together.

separation between low and high socioeconomic status, for example, 47 percent of household in the lowest SES made from low quality materials, whereas dwelling of the highest made from high quality materials almost exclusively (99.8 percent). Reassuring by water supply, the lowest used tap water only 8.1 percent, while almost solely (93.7) of the highest done so.

Table 3.4 The percentage of household by socioeconomic variables and SES quartiles

Variable	Quartiles (percent of household)						
	Q1 (Lowest)	Q2	Q3	Q4 (highest)	Average	Q1/Q4	Q1-Q4
Household asset							
Television	23.2	88.5	98.8	99.7	77.6	0.23	76.5
Radio	19.7	61.8	85.6	96.1	65.9	0.20	76.4
Refrigerator	2.8	34.9	92.0	99.5	57.4	0.03	96.7
Washing machine	0.3	1.5	8.2	70.7	20.2	0.00	70.4
Telephone	0.5	2.5	7.7	66.4	19.3	0.01	65.9
Air-condition	0.3	0.7	1.2	26.5	7.2	0.01	26.2
Fan	26.8	88.6	97.8	99.0	78.1	0.27	72.2
Car	1.0	3.5	10.8	60.0	18.9	0.02	59.0
Motorcycle	15.2	54.1	80.9	75.8	56.5	0.20	60.6
Tractor	2.5	8.0	9.5	4.4	6.1	0.57	1.9
Agricultural machine	4.7	14.9	18.7	15.0	13.3	0.31	10.3
Household characteristics							
Material construction	47.0	97.1	99.4	99.8	85.8	0.47	52.8
Sanitary amenities							
Toilet	36.4	87.1	96.0	98.7	79.6	0.37	62.3
Water supply	8.1	36.4	68.9	93.7	51.8	0.09	85.6
Cooking fuel	15.2	42.4	50.5	70.8	44.8	0.21	55.6

Comparison across ethnic groups Unfortunately, there is rarely conventional evident or national measure for comparing socioeconomic status across ethnic groups in Thailand. However, the index shows the reasonable ethnic ranking by SES with Chinese was in the highest position followed by Thai, while ethnic hilltribes were concentrated at the bottom. This ranking supports by various studies and surveys. Phagaphasvivat (2003) indicates that the ethnic Chinese are dominant in commercial class; most of entrepreneurs are Sino-Thai. Furthermore, they have a role in expand entrepreneurial activity and accelerate the economic development process in Thailand. Apart from Chinese, SES of the major Thai was relatively higher than other groups. In 2000, per capita income of the whole kingdom was about 78,535 baht (1,958 US$: 40.11 baht/1 US$) (National Social and Economic Development Board, 2002). Whereas, the Basic Minimum Needs Survey (BMN) among ethnic hilltribes in 1997 reveals that 80 percent of hilltribe household earned income less than 15,000 baht per year (Hilltribe Welfare Division, 2005)

3.5.4.4 Measures of Mortality Inequalities: Rate Ratios and Absolute Differences

There are many different ways to quantify inequality ranking form simple to sophisticated measure. A wide variety measures for the magnitude of socioeconomic inequality in health has been listed by Mackenbach and Kunst (1997). For this study, the measurement of both rate ratio and absolute differences were applied. Rate ratio is a relative difference between two extreme groups with the rate for the top group is expressed as a multiple of the bottom group disregarding to information contained in the middle two quartiles. While the absolute summarizes the difference between its won value of the highest socioeconomic status (Q4) and the lowest socioeconomic status (Q1). In order to capture the socioeconomic gap by household characteristics in each ethnic group, the percentage of household in lowest and highest socioeconomic quartile were used for estimation. Similarly to access to U5MR inequality by SES, both rates in extreme socioeconomic strata were employed to calculate as

Q1/ Q4	(rate ratio)
Q1 – Q4	(rate difference)

3.6 Results

3.6.1 Background Characteristics of Household by Ethnicity

A total of 471,920 households from 2% of Thais and 20% of other ethnic groups in the 2000 population and housing census were included in the analysis. Table 3.5 presents selected characteristics of the nine ethnic groups, covering demographic characteristics, educational status, legal status, and geographical setting. The statistics reveal large differentials in each ethnic group.

The Chinese had the highest percentage of female headed household followed by Thai, Khmer, and Malay, whereas the percentage in Mon and ethnic hilltribes were fairly low. The most numerous of Thai, Chinese, Khmer and Mon were Buddhists, while mostly of Malay had evolved to Islamism. Religious affiliation was varied among ethnic hilltribes. In the past, they were allied to animism, but later Buddhism and Christianity has been predominately among them, with about 70-75 % of Karen and Hmong were Buddhists and approximately a half of Lahu and Akha were Christians. For others religious of these groups, it might be animism which some of them still adhered with the old traditional beliefs (Sirisai, 1996).

Majority of household head of almost ethnic groups worked in agricultural sector, especially Khmer and ethnic hilltribes. Except for Chinese, where 2 in 5 of them held positions on trade and mainly of the rest ran their own business and worked in service activity. A part form agriculture, Thai people worked on trade, factory, and public administration. For nearly a half of Mon worked outside agricultural sector, they worked as employee in fishery, manufacturing, and construction.

Household heads of Malay and Khmer were born in Thailand almost exclusively. Interestingly, mostly household head of hilltribes were also born in Thailand, except Mon, the majority of them were born in foreign countries, particularly Myanmar. Among ethnic hilltribes, Akha attained the lowest percentage of household head with native born.

Nationality replies to accessibility of varying rights of citizenship. The nationality of household head relates to poverty through a combination of social

discrimination, limited legal status, and restricted access to services including education, welfare, and health service. Most of household heads in each ethnic group have obtained Thai nationality. Comparison among ethnic hilltribes, the percentages of household head with Thai nationality of Akha and Lahu were quite lower than Karen and Hmong. The percentages of the latter groups were higher than 90%. When comparing the percentage of household heads whose born in Thailand and their nationality, it was noted that the differences were quite drastic for Lahu and Akha. It can be implies that even though they were born in Thailand, they could not achieved Thai citizenship.

The percentage of literacy of household head varied enormously across ethnic groups. The percentage of Khmer was closed to Thai while, the others were relatively lower than Thai. Even though the groups which are well integrated to main stream culture and have been encouraged to become Thai citizens for a long period of time, there were only 59 % for Malay and 62 % for Chinese. Among ethnic hilltribs, Hmong was more literate than others were.

Similarly to the proportion of educated woman in a household, the proportion of women aged above 14 years who attended school was markedly different from Thai. Mean proportion of educated woman for Malay only 0.7 and 0.6 for Chinese. Whereas, ethnic hilltribes presented a large discrepancy, about 4-5 times lower than Thai.

A growing body of evidence indicates that ethnic inequalities are related to geographical setting, which is recognized as a disproportionate contribution of each country's material resources relative to the spatial distribution of national populations (Gugler, 1996; Brockerhoff and Hewett, 2000). There are vast disparities in living area, with only about 1% of Karen and 2% of Lahu and Akha lived in urban. A large amount of ethnic hilltribes generally lived in remote upland site. Yet, the percentage of living in urban area was relatively high in Mon as compared with ethnic hilltribes. Chinese was a group that has a highest percentage of living in urban area, especially Bangkok metropolitan, while the Thai ethnic group lived in urban area only 31%.

Table 3.5 Background characteristics of household by ethnicity

Household characteristics	Ethnic affiliation								
	Thai	**Chinese**	**Malay**	**Khmer**	**Mon**	**Karen**	**Hmong**	**Lahu**	**Akha**
% of female headed household	25.4	32.8	21.5	23.0	13.8	15.6	12.9	15.3	19.1
% religion of head of household									
- Buddhism	96.9	87.5	1.0	99.5	93.4	75.1	70.9	50.4	35.5
- Islam	2.0	6.6	98.9	0.0	4.1	0.3	0.1	0.3	0.2
- Christianity	0.4	9.0	0.1	0.0	1.5	21.9	8.9	43.1	51.5
- Others	0.7	1.9	0.0	0.5	1.0	2.7	20.1	6.2	12.8
% of head of household with native born	99.4	77.9	96.2	97.6	26.6	92.6	92.7	92.4	87.6
% head of household with Thai nationality	99.7	77.3	99.4	98.9	17.4	93.8	91.6	67.6	44.4
% literacy of head of household	93.5	62.3	59.3	84.7	25.7	23.9	34.7	14.2	11.1
% of head of household works in agricultural sector	45.4	28.2	61.9	79.5	51.1	84.9	83.3	89.2	83.6
% of household in urban area	31.0	69.5	16.9	4.9	27.8	1.3	8.7	1.7	1.7
mean proportion of women aged over 14 years attended school (SD)	0.9 (0.2)	0.6 (0.4)	0.7 (0.4)	0.9 (0.3)	0.2 (0.4)	0.3 (0.4)	0.3 (0.4)	0.2 (0.3)	0.2 (0.3)
Mean of household size (SD)	3.6 (1.6)	4.4 (2.1)	4.8 (2.2)	4.1 (1.6)	3.8 (1.8)	4.2 (1.8)	5.9 (2.7)	4.4 (1.8)	4.6 (2.0)
Mean of CEB (SD)	2.5 (2.0)	3.1 (2.3)	3.1 (2.2)	3.0 (2.2)	2.5 (2.1)	2.8 (2.1)	3.8 (2.0)	2.8 (2.0)	2.8 (1.9)

Mean number of members in a household in Hmong was greater than other ethnic groups, followed by Malay, with averaging 5.9 and 4.8, respectively. Likewise, average number of children ever born (CEB) in Hmong was highest as compared to the others. Thai has the lowest mean number of member in a household and children ever born, that was 3.6 and 2.5, respectively. Other ethnic groups have slightly greater number of CEB than Thai, averaging 2.8-3.8.

3.6.2 Socioeconomic Differentials

Among the nine ethnic groups, Chinese attained high socioeconomic status than Thai, Malay, and Kkmer (Table 3.6) whereas the latter accomplished higher socioeconomic status than Mon and ethnic hilltribes. About 61% of Chinese were in the forth quartile (highest SES), compared with 33% of Thai, 13% of Malay, and 6% of Khmer. Most households in all of ethnic hilltribes were in the lowest SES with the range between 70-80%. Socioeconomic status of Mon was somewhat better than ethnic hilltribes. Among ethnic hilltribes, Hmong seemed to have better SES than others. Karen and Lahu were the lowest groups in SES.

Table 3.6 Percentage distribution of household by ethnicity and socioeconomic status

Ethnicity	% of population according to socioeconomic status			
	Q1 (lowest)	Q2	Q3	Q (highest)
Chinese	15.4	9.6	13.7	61.3
Thai	14.6	22.9	29.8	32.7
Malay	36.4	28.6	21.8	13.2
Khmer	39.1	37.9	17.2	5.8
Mon	65.9	16.4	7.9	6.2
Hmong	73.0	18.1	6.4	2.5
Akha	79.6	13.7	4.6	2.1
Karen	82.4	11.5	4.8	1.3
Lahu	82.6	11.8	4.3	1.3

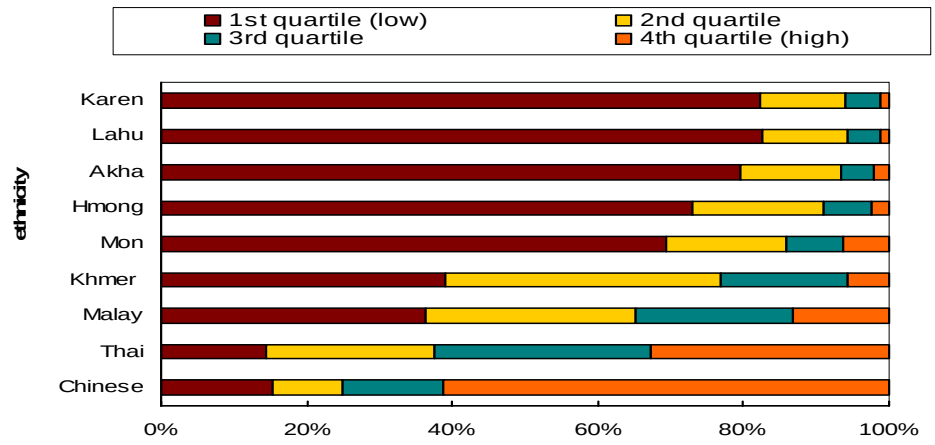


Figure 3.3 : **The percentage of household by ethnicity and SES in the 2000 population and housing census**

According to Table 3.7 comparing the differences of SES by household characteristics, literacy by head of household in all ethnic groups showed a clear gradual increase along all the quartiles of the socioeconomic index. The head of households with high socioeconomic status were more literate than their low socioeconomic counterparts. For Thai and Khmer, the lowest-highest ratios were close to unity (0.9, 0.8 respectively), whereas, the literacy differential between lowest and highest socioeconomic group of Chinese and Malay appeared much wider than the former groups. The lowest-highest ratio in ethnic hilltribes showed substantially large gaps, with 0.2, 0.2, and 0.1 for Karen, Lahu and Akha, respectively but in Hmong, the size of difference was smaller than other ethnic hilltribes (0.5).

A statistically significant association of nationality of household head and SES was observed (except Khmer). There was no variation of nationality across the socioeconomic quartiles in Thai and Malay. Also, the lowest-highest ratios of Karen, Hmong, and Lahu were close to unity. Socioeconomic status differences in Mon were relatively large (0.1). Mon with Thai nationality tended to achieve high SES.

The geographical setting showed variations across the constructed socioeconomic index. Socioeconomic status appeared to improve with living in urban areas in almost all ethnic groups excluding Hmong. The lowest-highest ratios were comparatively large in ethnic hilltribes. On the other hand, Hmong households in urban areas were more often in the lowest socioeconomic status than the highest SES.

Table 3.7 Household characteristics by ethnicity and socioeconomic quartiles

Indicator	n	% household according to socioeconomic status				P-value	Lowest/ highest ratio
		1 (low)	2	3	4 (high)		
Literacy of household head							
Thai	287 208	87	91	94	97	0.000	0.9
Chinese	5 660	38	41	57	72	0.000	0.5
Malay	31 599	50	57	66	79	0.000	0.6
Khmer	59 757	79	86	92	97	0.000	0.8
Mon	1 524	18	27	57	79	0.000	0.2
Karen	3 716	18	45	64	84	0.000	0.2
Hmong	1 472	31	43	47	60	0.000	0.5
Lahu	491	11	23	40	69	0.000	0.2
Akha	273	6	22	43	58	0.000	0.1
Nationality of household head							
Thai	305 347	99	99	99	99	0.115	1.0
Chinese	7 031	60	64	75	84	0.000	0.7
Malay	52 953	99	99	99	99	0.012	1.0
Khmer	69 812	98	99	99	99	0.027	1.0
Mon	1 029	8	18	50	78	0.000	0.1
Karen	14 586	93	96	97	98	0.000	0.9
Hmong	3 891	90	95	96	98	0.000	0.9
Lahu	2 327	66	75	77	78	0.000	0.8
Akha	1 089	38	66	78	73	0.000	0.5
Household head works in agricultural sector	135 346	57	61	50	21	0.000	2.7
Thai	1 689	49	46	30	5	0.000	9.8
Chinese	28 279	59	60	49	25	0.000	2.4
Malay	54 348	83	82	73	46	0.000	1.8
Khmer	2 966	58	32	27	24	0.000	2.4
Mon	12 861	85	79	63	60	0.000	1.4
Karen	3 459	82	86	75	67	0.075	1.2
Hmong	2 946	88	80	59	62	0.016	1.4
Lahu	1 968	84	75	43	49	0.010	1.7
Akha							
Household in urban area							
Thai	95 335	17	19	25	51	0.000	0.3
Chinese	6 314	30	30	48	90	0.000	0.3
Malay	9 009	11	12	19	37	0.000	0.3
Khmer	3 463	3	4	7	18	0.000	0.2
Mon	1 649	22	37	44	44	0.000	0.5
Karen	196	1	2	6	15	0.000	0.1
Hmong	370	11	1	1	2	0.000	5.5
Lahu	57	1	1	8	9	0.000	0.1
Akha	42	1	5	7	15	0.000	0.1

3.6.3 Levels and Trends in Under-Five Mortality

The under-five mortality estimates were based on data for women aged 25-39 for the periods 4-8 years before the date of the 2000 census. Estimates referring to the most recent period are based on women aged 25-29 years. Results from the indirect estimation indicate that there was a declining trend in the rates of child mortality over time (Figure 3.4 A and 3.4 B). U5MR of almost all the ethnic groups has been in substantial decline, particularly Mon, and ethnic hilltribes. For the majority Thai, Chinese, and Khmer, U5MR slightly decreased and the rates were also low. Chinese had the lowest rates followed by Thai, and Khmer, with the rates in 1989 of about 9.7, 19.6, and 23.0 per 1,000 livebirths and declined to about 6.5, 14.3 and 17.9 per 1,000 livebirths, respectively in 1995. The under-fiver mortality trend for Malay was different from other ethnic groups; it slightly increased over time. The rates for Mon sharply decreased from 40.5 per 1,000 livebirths in 1989 to 10.8 per 1,000 livebirths in the succeeding 6 years.

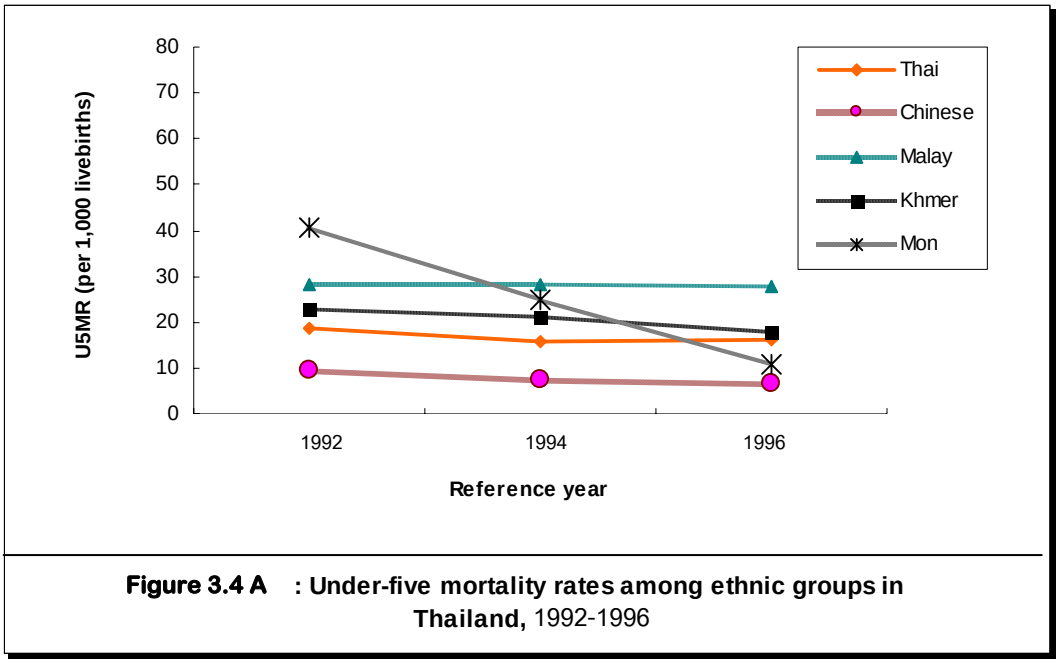


Figure 3.4 A : Under-five mortality rates among ethnic groups in Thailand, 1992-1996

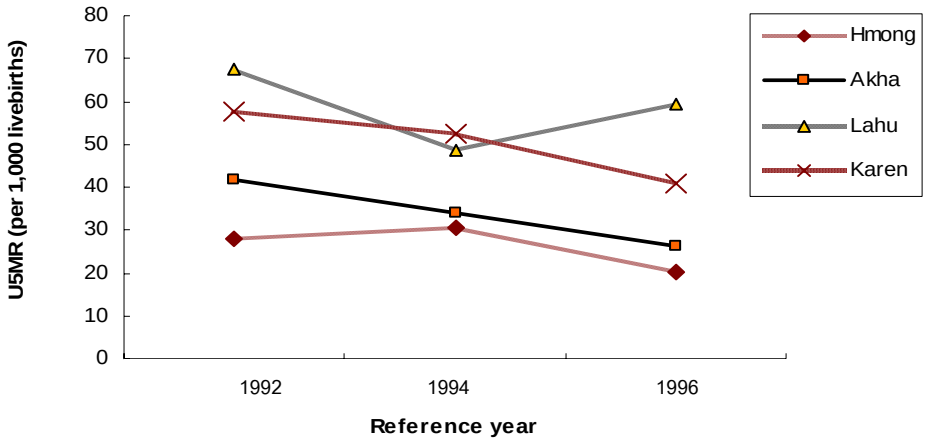


Figure 3.4 B : **Under-five mortality rates of four ethnic hilltribs,** 1992-1996

Table 3.8 Under-five mortality rates by ethnicity and reference year

Ethnicity	U5MR (95% CI)				
	Reference year				
	1986	1989	1992	1994	1996
Thai	33.9 (31.8-36.0)	24.8 (23.2-26.4)	19.6 (18.6-20.6)	16.1 (15.1-17.1)	14.3 (13.1-15.5)
Chinese	18.3 (11.5-25.1)	24.6 (17.8-31.4)	9.7 (5.8-13.6)	7.4 (3.5-11.3)	6.5 (1.3-11.7)
Malay	45.7 (39.5-51.9)	41.0 (35.8-46.2)	27.7 (25.6-30.0)	28.3 (26.1-30.7)	29.6 (27.0-32.2)
Khmer	41.6 (36.8-46.4)	40.4 (36.3-44.5)	23.0 (21.1-24.9)	21.3 (19.4-23.2)	17.9 (15.7-20.1)
Mon	47.1 (23.1-71.1)	29.5 (14.4-44.6)	40.5 (29.0-52.0)	25.0 (16.3-33.7)	10.8 (4.6-17.0)
Karen	83.6 (68.1-99.1)	67.4 (55.8-79.0)	57.8 (51.6-64.0)	52.3 (46.9-57.7)	40.7 (35.5-45.9)
Hmong	56.3 (29.2-83.4)	42.2 (23.5-60.9)	28.1 (21.0-35.2)	30.4 (24.1-36.7)	20.1 (14.3-25.9)
Lahu	83.7 (49.0-118.4)	68.7 (43.0-94.4)	67.4 (54.3-80.5)	48.7 (38.1-59.3)	59.4 (45.6-73.2)
Akha	73.3 (36.1-110.5)	53.2 (26.8-79.6)	41.6 (28.9-54.3)	33.9 (22.3-45.5)	26.2 (14.0-38.3)

Levels of under-five mortality varied widely across ethnic hilltribes – from 28 to 67 per 1,000 live births in 1989, 30 to 52 per 1,000 live births in 1992, and 20-59 per 1,000 live births in 1995. Hmong achieved the lowest rates of U5MR, followed by Akha and Karen. U5MR in Lahu were quite high. However, U5MR in all ethnic hilltribes tended to decline continuously.

However, there are fluctuations in estimates among ethnic hilltribes and table 3.8 also shows the large standard errors in U5MR among these groups including Chinese and Mon.

3.6.4 Socioeconomic Status and Child Mortality

Table 3.9 demonstrates U5MR of the nine ethnic groups according to socioeconomic status strata. The results reveal that there are severe fluctuations in the estimates in nearly all ethnic groups. This shortcoming was due to insufficient number of death attributed to each socioeconomic quartile, predominantly forth quartile in ethnic hilltribes. To this extent, for a more robust estimate, the analysis of child mortality inequality across SES was done by assembling ethnic groups into three clusters as already mentioned (the results show in Figure 3.5). Under-five mortality rates for this section were estimated from the data on the most vigorous age group, 30-34 years ($q(5)$), thus reference year is circa 1992.

Table 3.9 U5MR in 1992 by ethnicity and household socioeconomic quartiles

Ethnicity	Household socioeconomic			
	Q1 (lowest)	Q2	Q3	Q4 (highest)
	U5MR	U5MR	U5MR	U5MR
Thai	17.18	17.15	16.15	14.46
Chinese	7.92	17.30	38.24	0.86
Malay	27.34	37.78	22.18	22.46
Khmer	16.98	24.24	24.24	18.66
Mon	40.98	6.87	*	*
Karen	53.62	52.75	12.73	10.37
Hmong	23.54	48.71	48.51	39.55
Lahu	42.54	20.64	68.59	*
Akha	37.20	21.57	*	*

* The sample sizes are too small for reliable estimate.

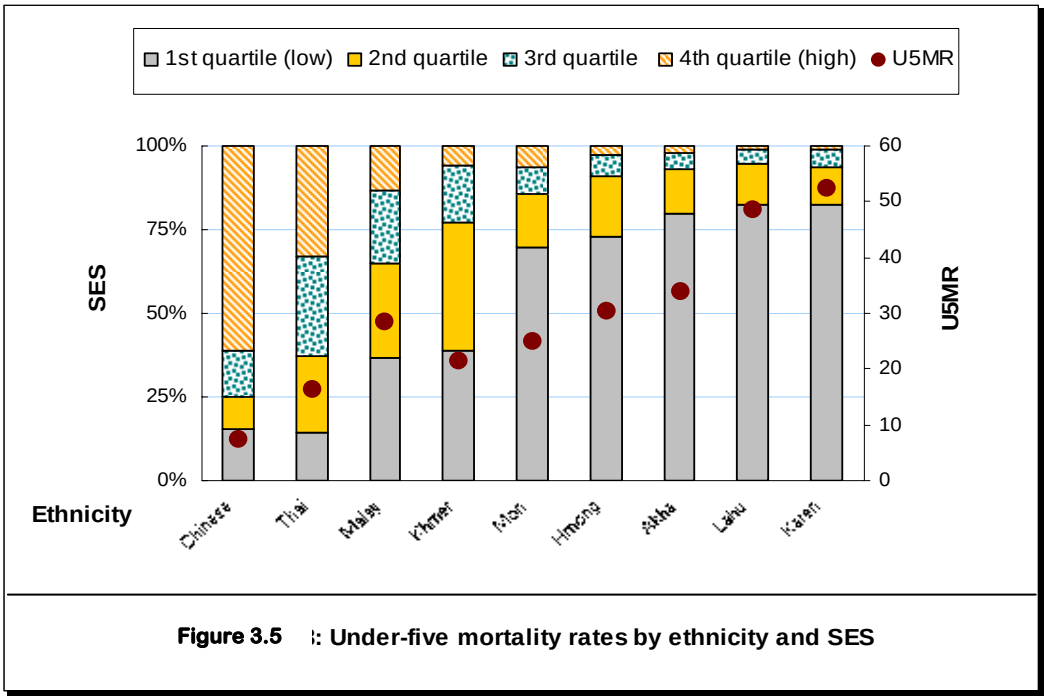


Figure 3.5 : Under-five mortality rates by ethnicity and SES

Table 3.10 U5MR per 1000 livebirths by ethnicity and quartiles of household socioeconomic status

Socioeconomic status	Thai	Hilltribes	Other ethnic groups
	U5MR (95%CI)	U5MR (95%CI)	U5MR (95%CI)
Quartile 1 (lowest)	17.2 (15.0-19.6)	50.8 (46.5-55.4)	30.9 (28.6-33.6)
Quartile 2	17.1 (15.3-19.2)	48.1 (37.1-59.4)	29.8 (27.1-36.7)
Quartile 3	16.1 (14.5-18.0)	28.5 (15.6-41.7)	23.6 (20.4-27.0)
Quartile 4 (highest)	14.4 (12.7-16.4)	29.7 (7.6-52.0)	18.9 (15.0-23.0)
Rate ratio (Q1/Q4)	1.2 (1.2-1.2)	1.7 (1.1-6.1)	1.6 (1.5-1.9)
Absolute difference (Q1-Q5)	2.8 (2.3-3.2)	21.1 (3.4-38.9)	12.0 (10.6-13.6)

However, U5MR and SES of all nine ethnic groups were simply presented together in figure 3.5. It illustrates the extent to which U5MR seemed to correlate with socioeconomic index. Under-five mortality rates increased in line with the percentage of the bottom quartile increase. Children in ethnic groups with high SES were more likely to have a higher probability of survival. Chinese obtained the highest SES and attained the lowest U5MR. Most Lahu and Karen were in the lowest SES with high U5MR and although SES of Malay was higher than Khmer and Mon, their U5MR was higher than those ethnic groups.

Inequalities in mortality across SES are shown in Figure 3.6. The under-five mortality rates in all socioeconomic quartiles were lowest in the ethnic Thai group, followed by other ethnic groups and the last were the ethnic hilltribes. The relationship between socioeconomic status and child mortality was observed to be the reverse, with U5MR concentrated in those at the lowest end of the socioeconomic scale. Disparities are quite different for different ethnic groups but the size of the differences varied between groups. Socioeconomic mortality differences were especially large in ethnic hilltribes, almost twice as children belonging to households in the bottom quartile were more likely to die before reaching 5 years of age than those who living in household in the top quartile.

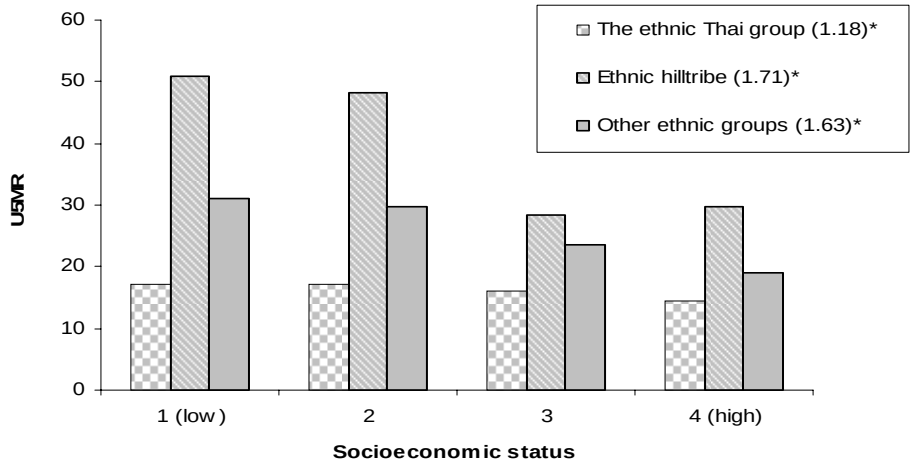


Figure 3.6 : Under-five mortality rates by etnic group and SES

* Lowest/highest ratio

The relative gap was comparatively small in the ethnic Thai group with only 1.18. That means that the Thai children who were in the lowest SES tended to die before their fifth birthday more than those who were in the highest SES around 1 time. Meanwhile, the hilltribe children in the lowest SES were 2 times more likely to die than their counterparts. Other ethnic groups were in neutral, between Thai and hilltribes. Considering absolute difference, the value was noticeably different among three ethnic groups. The gap of disparity was large in ethnic hilltribes (21), while only 3 in Thai.

3.7 Conclusion and Discussion

This is the first study to report on socioeconomic inequality in child mortality within ethnic groups in Thailand. Before discussing the study's findings, the discussion is needed on the creditability of the use of language as a proxy of ethnicity and to consider the potential sources of bias in the mortality analyses as well as the socioeconomic index. Then, mortality rates, mortality inequalities and the contribution of socioeconomic status inequalities on child mortality among ethnic groups are discussed.

Methodological issues

First, because the census does not provide the data on ethnicity, this study used the language usually spoken in a household to identify the ethnicity of subject. Conventionally, many scholars have used *'the country of birth'* as a proxy of ethnicity when the data on ethnicity was not available (Wild and Mckeigue, 1997; Bos, et al., 2005). This data also has been included in Thailand census but it does not seem appropriate for this study, because the use of the country of birth does not take into account the diversity of ethnicity actually exiting in the country. The samples were born almost exclusively in Thailand. Indeed and even though they were born in this country, they still retained their unique and diverse cultures. The classification of ethnic group using the language was reasonably reliable and was confirmed by several reports related with ethnic groups in Thailand in terms of the geographical distribution

and the rank of ethnic groups by number of household and population (Ministry of Labour and Social Welfare, 2005; Aguettant, 1996).

Second, in regard to mortality analysis, U5MR were calculated using retrospective survey data on the number of children ever born and number surviving often distorted either by errors in the number of children who die or are alive. Quantifying bias was done by observing average parity and mean number of children dead by age group of women. It indicates that the reporting of fertility and deceased child experience of the women appeared fairly accurate. However, when the proportion of children dead in each age group of women was observed, there were some defects to the extent that women in some age groups must have misstated either the number of children ever born or the number of children dead or both, particularly in the young and old age groups. Thus the deficit age groups were excluded from the U5MR estimation in order to create a more robust estimate.

Third, the validity of the use indicator of socioeconomic status may not equally proper for all ethnic groups. Because among studied groups may have different norms on low and high socioeconomic status. Also, the differences of period of time between the time of U5MR estimates and the time of socioeconomic status have to be considered. The former was derived from periods before the time of the census, while the latter was obtained form the year of the survey. The discrepancy of time might be affected by social and economic changes, notably in Thai and Chinese who are greatly involved with socioeconomic boom and crash of the 1990s. However, these shortcomings can be reasonably disregarded as certain studies have noted that the economic boom during the pre-1997 period and the economic collapse of 1997 had little effect on socioeconomic status (Warr, 2000). Likewise, the comparison study on economic status between the 1990 and 2000 censuses (Vapattanawong, et al., 2007) indicates that the economic strata were slightly shifted during 10 years.

Under-five Mortality rates

When comparing U5MR estimated from this study with other sources, it appears relatively lower than some sources. That is, the rates of ethnic Thai are about

2 times lower than the rates within the same periods of the whole kingdom reported by UNICEF, but quite close to the estimates from the Surveys of Population Change and higher than the rates from civil registration. For other ethnic groups, unfortunately, the studies on estimation of U5MR on a national scale are unavailable for comparison. There is only the estimation on a provincial scale (Kanchanasinith and Porapakkham, 1988) where the rates of each group are enormously varied across provinces and could not represent child mortality as a representative figure of each ethnic group.

However, this study yields the foremost results of child mortality in various ethnic groups in Thailand. Even if the mortality rates seem to under estimate, they are still useful for indicating the magnitude of mortality differences and notifying the urgent ethnic groups in terms of their significance in policy attention to reduce child mortality.

With regard to mortality differentials among selected ethnic groups, the estimates of this study seem reasonable; the child mortality rates were typically high in the low SES groups, and by contrast, they were frequently low in the high SES groups. Chinese with the highest socioeconomic position enjoyed the lowest rates followed by the majority Thai and the well integrated groups, while hilltribes who were concentrated in the low end of socioeconomic status suffered from high rates of U5MR. The results in rates of the Thai are consistent with that reported in other Thai studies (Hill, et al., 2006). Among other ethnic groups, there are very few studies to support these findings, moreover most of them are outdated and focused on infant mortality rather than under-five mortality. For example, infant mortality rates in Thai Muslims, nearly all of them were ethnic Malay, were slightly higher than Buddhist Thai (Kanchanasinith and Porapakkham, 1988: 26-28). The Hmong are ethnic hilltribes that many researchers study, the infant mortality was also much higher than general Thai (Kunstadter, et al., 1993).

Under-five Mortality inequality

The findings on differentials in U5MR between the highest and the lowest socioeconomic status in the cluster three clusters of ethnic groups indicated that the

Thai had the smallest magnitude of inequality followed by other ethnic groups, while hilltribes encountered the largest discrepancy. The explanation for these inequalities may be due to the critical difference within ethnic groups in relation to legal status, educational attainment, and living area. According to the results, Thai, Chinese, Malay and Khmer were not much different in each SES indicator and that means they might able to access social welfare and other facilities equally, while greater differences in legal status, educational attainment, and literacy were found within ethnic hilltribes. There was a large proportion of Lahu and Akha who have not been granted Thai nationality. These disadvantages may be a reflection of the restrictions on their freedom of movement, opportunities to attend school and other welfare benefits.

Because no other studies on child mortality among ethnic groups in Thailand, except the figure of whole country, are available, it is unable to compare the inequalities in mortality in 8 sub-ethnic groups with other findings. At the national level, the study on child-mortality inequalities in 2000 (Vapattanawong, et al., 2007) shows slight differences between the poorest and the richest populations in all three measures- the rate ratio (1.8), the absolute difference (10.1), and the concentration index (-0.12). Cleland and colleagues (1992) used World Fertility Survey (WFS) and Demographic Health Survey (DHS) to compare U5MR of general Thais with socioeconomic indicators by both absolute and relative differences in 1975 and 1985. The results reveal significant differentials between advantaged and disadvantaged groups in terms of mother's education, father's occupation, and geographical location.

Contribution of socioeconomic status inequalities to U5MR

This study has clearly shown that U5MR were different among 9 ethnic groups. The variations rely on the socioeconomic status of each ethnic group; the groups with large proportion of high SES were more likely to enjoy low death rates than their counterparts. Further, inequalities in child mortality were evident found within ethnic group, the mortality rates often fell in a continuous linear gradient from the lowest to the highest socioeconomic status. It is reasonable to conclude that SES is a crucial factor contributing to child mortality differentials among and within ethnic groups in Thailand.

However, as there was a limitation with regards to the census data, so the socioeconomic index in this study just covered only a few dimensions of socioeconomic status. Additional explanations are appended to support the findings. Education, occupation, and area of residence are widely used as indicators of differentials in child mortality. The cross-countries study of 12 developing countries including Thailand (Cleland, et al., 1992) noted that in the mid-1980s general Thai children of uneducated mothers were 1.4 times more likely to die before the age of five years than the offspring of primary school mothers. This study also employed paternal occupation to an analysis criteria by making a comparison between agrarian, blue collar and white collar, it appeared that the mortality rates of children whose fathers were agrarian and blue collar were higher than their white collar counterparts by about 3 and 2 times, respectively. With regards to areas of residence, rural children were 2 times more likely to die before the age of five years than those who lived in urban areas.

Nevertheless, differences in child mortality rates are not totally attributable to socioeconomic status, and may also be influenced by other factors. Some empirical evidence is provided for extending the explanation as to why some ethnic groups have higher death rates than the general Thais. Importantly, it should be stressed that access to health care services may be a critical cause of inequality. According to the survey by the Highland Health Development Center in 1996 and 2001 (Sangelek, 2002), the percentages of anti natal care (at less 4 times) among pregnant hilltribes were particularly low at 36% in 1996 and then suddenly increased to 70% in 2001. The percentages of deliveries attended by trained birth attendance were also low, with 53% and 76% in 1996 and 2001, respectively, while general Thais received these services in almost all cases. Furthermore, the percentage of low birth weight (less than 2,500 grams) in ethnic hilltribes was about 3% and 4% higher than Thais in 1996 and 2001, respectively. Additionally, vaccination coverage in the late 1990s among children less than 1 year was approximately 60% (for diphtheria-pertussis, tetanus triple vaccine, oral polio vaccine and measles) and about 80% (for tuberculosis vaccine), whereas the percentage for Thais was over 90% for all kinds of vaccines (Wibulpolprasert, 2002).

Though, in relation to the study on ethnic groups with diverse cultures, the variation in world view, behavior, and social circumstance of each ethnic group might affect to the differentials in child mortality. Yet, these aspects have not much explored in Thailand; the rest of them were investigated by qualitative approach reported in the next chapter.

CHAPTER IV
FACTORS CONTRIBUTING TO INEQUALITY IN CHILD MORTALITY: A QUALITATIVE STUDY

4.1 Introduction

According to the limitation of data, the analysis using the national census to identify the factors contributing to inequality in child mortality in chapter 2 could explain the differences of child mortality among ethnic groups merely by socioeconomic status of households. Based on the Mosley and Chen framework (1984), various important factors accountable for child mortality inequalities remained unexplored. As this study focused attention on ethnic groups, ethnicity is an extremely powerful factor of life chances as well as social, psychological, and behavioral group differences. Various aspects affecting child mortality are essential to be explored, in particular issues that cannot be easily identified by quantitative approach, for instance, cultural perception related to child care and maternal health behaviors. Therefore, an in-depth qualitative study was applied to explain the factors behind child mortality differences among ethnic groups.

4.2 Specific Objectives

The purpose of this part is to explore the factors contributing to inequality in child mortality among ethnic groups. The description and analysis is demonstrated through community, household, and individual level in a village context of selected ethnic groups.

4.3 Methodology

4.3.1 Setting

According to the U5MR estimation in chapter 3, the finding indicated that among sub-ethnic groups, hilltribes (Hmong, Karen, Lahu, and Akha) had higher rates than other ethnic groups (Khmer, Malay, and Mon). To compare child mortality differences between two categories, Karen from hilltribe groups was purposively selected as it had larger number and higher mortality rates than other tribes. Among Khmer, Malay and Mon, the quantitative findings revealed that the first two groups were relatively close to Thai people in terms of socioeconomic status. It seemed quite far to compare these two groups with the Karen, thus, Mon was selected.

Although several provinces of Thailand have a border with neighboring countries and comprise various ethnic groups, Kanchanaburi province located in the western part of Thailand was purposively selected as a study site because it has high number of both Karen, and Mon. Moreover, the Institute for Population and Social Research, Mahidol University had operated a demographic surveillance system (DSS) with the intention of monitoring the changes in fertility, migration, and mortality of all subjects, including ethnic minorities in this province. The data were obtained annually over five years from 2000 up to 2004. Thus, this project provides useful data for mortality study. Two villages in upland areas, one Karen village in Thongphapume district, and one Mon village in Sangkaburi district were selected as study areas based on the criteria that they contain a lot of Karen and Mon people and the number of child deaths were higher than other villages.[1]

4.3.2 Study participants

According to objectives and conceptual framework, this study aims to explore the factors affecting inequality in child mortality at three levels; community, household, and individual. At the community level, the context of the villages was explored through various local authorities including Karen and Mon leaders (see Table 4.1).

[1] The researcher analyzed the data on the number of ethnic minority population and the number of dead child from Khanchanaburi DSS in 2000-2004.

Table 4.1 Study participants

Level	Data	Method	Participant (number of case)	
			Karen	Mon
Community	- Geographical setting - Community organization - Transportation - Physical infrastructure - Health care system	- Direct observation - Group interview - In-depth interview	- - Community committee (3) - Border patrol chief (1) - Head of village assistance (1) - Sub-district administrator (1) - Head of district health administrative office (1) - Church leader (1) - Monk (1)	- - - Head of village (1) - Sub-district administrator (1) - The chief of conservator of forests (1) - Mon leader (1) - Health center officer (1)
Household	- Characteristics of household - Economic status of household - Woman status - Value of children	- Direct observation - In-depth interview	- - Husband and wife (62 household: 4 households including grandparent)	- - Husband and wife (27 household: 2 households including grandparent)
Individual	- Characteristics of mother - Fertility behaviors - The use of health care service - Antenatal care - Delivery care - Childcare - Vaccination - Well baby clinic attendance - Belief of cause of illness	- Direct observation - In-depth interview - Group interview	- - mother (62) - Traditional birth attendance (4) - Head of health center (1) - Health volunteer (2) - Sacred healer (2) - Community healer (1) - Nurse (3) - Teacher and care takers in child care centre (3)	- - Mother (27) - Traditional birth attendant (1) - Teacher in child care centre (1) - Herbalist /sacred healer (1) - Health volunteer (3)

At the household level, all households having children aged less than 5 years during the time of survey and/or reporting an experience of deceased child under-five within 5 years preceding the survey in Karen/ Mon study villages with parents identified as Karen/ Mon were selected subjects. The researcher surveyed all households in the studied villages and classified them according to the criterion. In the Karen village, there were 89 households which met the selection criteria, 62 households being approached (70%). The reason for the failed contacts was that the eligible households had moved temporarily to their rice fields for harvesting[2].

With regard to Mon, 33 households were quantified, but the obtained sample was 27 households (81%). Some of them were not willing to participate and some moved elsewhere during the survey. Husband and wife including grandparents in a household were interviewed household data in 4 aspects; economic status, woman status, value of children, and household characteristics, which are described in table 4.2.

At the individual level, all mothers interviewed at household level were automatically engaged in a study on mother's behavior influencing fertility, the use of health care, and child care. The Karen sample comprised the 62 mothers of 96 children under-five years and 27 mothers of 32 children for Mon (Table 4.3 and 4.4). In addition, influential informants who were involved with maternal behavior and child conditions, as such health care providers, traditional birth attendants, and teachers in child care centers, were recruited for the interview.

4.3.3 Data collection

To explore the context of the case including physical setting, economic setting, cultural perspective, and patterns of behavior in order to understanding a complex issue of inequality in child mortality among two ethnic minorities within their real-life

[2] During the time of fieldwork, it was the time of harvesting. The rice fields are quite far from the compound. Typically, when rice becomes mature, household labors move to stay at the rice fields for nearly a month so as to protect their products from wild hogs. Then, they harvest and do all processes at the rice field until the grains are ready for grinding which is easy for them to carry harvested rice back to the barn.

context, an ethnographic approach based on Mosley and Chen framework were employed through observations, in-depth interviews, and group interview.

Individual in-depth semistructured interviews were mostly applied to all three levels of data collection. Informal interviews and diary field notes were also supplemented. Group interviews were conducted 4 times to collect the data from a group of Karen community committees, nurses who were provided health services (antenatal care, family planning, and treatments), teachers and care takers in child care centers, and health volunteers. Direct and participant observations were applied during the time of the fieldwork. The researcher had good opportunities to participate in lot of events which yielded fruitful empirical data in a natural environment, particularly behavior and the circumstances in which the behavior was seen, such as post delivery and newborn care, traditional home treatment, management of measles outbreak, health services operation by a mobile clinic, funeral ceremony of under five years child, religious custom. Moreover, to increase credibility, other techniques were applied for data collection including nutritional measuring, verbal autopsy, six-month recall of illness episodes, and secondary review of maternal and child health booklet.

Regarding household and individual levels, the interviews were conducted in participant's own homes which were beneficial for household characteristics and daily life observation, or at a venue of their choice, often their work place (sweeper industrial units in Mon village). The interviews lasted about 2-3 hours, but for the cases that had an experience of deceased child, the data required more details, so the researcher revisited them to complete the interviews. The interviews systematically used a bilingual approach (Thai or Karen/ Mon) encouraging respondents to communicate in whichever language they were most comfortable in. Two Karens and 2 Mons who are local residents and spoken both languages fluently were translators in each village. In the case of participants who could not speak Thai fluently, the translator facilitated translation of questions and answers back and forth between the researcher and participants. All the interviews in Thai were tape recorded and transcribed, while the interviews assisted by translators were recorded in field notes. The fieldwork took place over 2 months in October and December 2006.

Table 4.2 Characteristics of sample households

Household characteristics	Percentage	
	Karen (n=62)	Mon (n=27)
Identity document of household head		
Identity card for hilltribe	46.7	25.9
Thai identity card	8.1	7.0
Temporary document	45.2	67.1
Education of household head		
No schooling	43.2	74.1
Primary school in Myanmar	33.8	17.0
Primary school or higher in Thailand	22.8	8.9
Health insurance card (covered children under 5 years)	16.1	7.0
Household head with native born	18.8	25.9
Household head can speak Thai fluently	36.9	64.8
Household head ever work in urban area	35.6	85.2
House is made by permanent materials	17.7	3.7
Poor household hygiene	66.1	44.4
Toilet	30.6	43.7
Average household income: baht (SD)	1,100 (795)*	3,377 (1,609)
Average household member (SD)	6 (1.7)	4 (1.2)

* exclude 2 outliers which had monthly income 20,000 baht.

Table 4.3 Maternal characteristics

Maternal characteristics	Percentage	
	Karen (n=62)	Mon (n=27)
Having an experience of child death (under-five years)	27.4	18.5
Having an experience of child death (under-five years) *last 5 years*	12.9	3.7
Education		
No schooling	53.2	59.3
Primary school (in Myanmar)	25.8	29.6
Primary school or higher (in Thailand)	20.9	11.1
Legal identity document		
No documents	6.5	32.9
Document for illegal migrant*	48.4	40.7
Identity card for hilltribe	40.3	18.9
Thai identity card	4.8	7.5
Native born	20.9	37.0
Good ability in Thai language	29.0	44.4
Ever live in other Thai villages	25.0	80.0
Ever work in urban area	37.9	62.9
Wage earner	25.0	81.4
Average age (SD)	30 (7)	28 (7)
Average year of living in Thailand (SD)	14 (5)	13 (7)

* Tor Ror 38/1 (Temporary identity card – to register as temporary residents for migrants) and orange card (Identity card for Burmese who illegally entered to Thailand)

Table 4.4 Proportion of living children and deceased child under 5 years by age and ethnic groups , 2002-2006

Age	Proportion of living children under 5 years at the time of survey		Proportion of deceased child under 5 years last 5 years before the survey	
	Karen (n=96)	Mon (n=32)	Karen (n=11)	Mon (n=1)
0-28 days	0.02	0.00	0.18	1.00
More than 28 days–12 months	0.09	0.28	0.64	0.00
More than 12 – 24 months	0.32	0.32	0.09	0.00
More than 24 – 36 months	0.21	0.22	0.00	0.00
More than 36 – 48 months	0.18	0.03	0.09	0.00
More than 48 – 59 months	0.18	0.15	0.00	0.00

4.3.4 Qualitative data analysis

The data analysis strategy was content analysis; both conceptual and relational analysis, and ethnographic and medical perspectives were employed to understand and interpret the behavior and perception of participants. This process was initiated with a general review and repeat reading of group interviews, observation notes and in-depth interview transcripts. All transcripts were coded and categorized following themes related to community context, household economic status and cultural perspective on woman status, value of children, and cause of illness and maternal behaviors related to fertility, use of health care, and child care. Further themes for coding emerged during this process, for example, *"religious beliefs"* and *"assimilation"*. The software program, NVivo 2.0, was utilized for this process. Codes were use to find specific occurrence in a form of frequency by using conceptual analysis. Then codes in each category were prepared as matrices for interpreting relationship or linkage in the aspect of cause and effect by using rational method.

4.3.5 Verification

At the time of interviews, participants were encouraged to talk freely. Transcription was completed following each interview before moving on to the next one. The researcher listened to recordings and checked the accuracy of the transcripts. The data cross checking was operated by observations, documentation, and data collection in the same topic from several numbers of the influential key informants. For instance, *"type of illness in Karen perception"*, the data obtained from mothers were cross checked by information from TBAs, sacred healers, and older Karens. For unclear and incomplete information, the researcher repeated interviews to gather additional data to verify the facts. As this study was a cross-cultural study, most data was obtained by translations. Some data might have been distorted, omitted, or lost in translation. The researcher was well aware of these shortcomings so several translators were employed for cross checking. Furthermore, throughout the period of fieldwork the researcher often shared observations, interpretations and initial conclusions with translators, interviewees and some other key informants. Their feedback motivated the researcher to explore more precise interpretations.

4.3.6 Ethical consideration

The consent letters for collecting data in the study areas issued by the university to which researcher is affiliated, were sent to local authorities (e.g., district chief, village head man, chief of border patrol police). Participants and village officials were informed about the objectives and methods of the study and uses of information they would supply. Despite permission granted by the village leadership, individual participants were requested to verbally consent to participate in the study. In accordance with sensitive questions on a deceased child history and cause leading to death, the researcher discussed with translators about how to ask these questions properly in respect of their culture. For newly experienced child death, the researcher delayed to conduct the interview nearly a month until the parents were ready to participate and the researcher also was sure to display a sensitive attitude during the interview. Because the villages comprised large numbers of illegal migrants and certain issues related to their legal status, the names of the villages have been omitted.

Qualitative Explanation for Factors Affecting Inequality in Child Mortality

The findings in this chapter are presented in following ways. First is a preview of child mortality between Karen and Mon, then the community level, focusing on physical and environmental factors affected to child mortality are explored. Next, economic status of household, women's status, and value of children are demonstrated at the household level. Finally, the individual level, maternal behaviors are described, especially fertility, pregnancy, delivery and child care behaviors.

4.4 The preview of child mortality inequality between Karen and Mon

At the national level, the findings in chapter two showed a significant difference in under 5 mortality rates between Karen and Mon. Karen had higher child mortality rate than Mon over time (Reference year 1986 to 1996). For example, in 1994, child mortality rate for Karen was 2 times higher than Mon. These differences also found at the provincial level using Kanchanaburi Demographic surveillance system (KDSS). A longitudinal data indicated that during 5 years of survey (2000-2004) there were 19 Karen children and 5 Mon children who died below 5 years of age (total number of children less than 5 years in each year were about 400 for Karen and 130 for Mon). Further, the fieldwork survey from studied villages found that during the 5 years before the fieldwork (2002-2006) 11 children under 5 years old of 62 Karen mothers had died, whereas only 1 child of 27 Mon mothers had died. So, it becomes clear that at all three levels, under 5 mortality rates are higher among Karen compared to Mon.

4.5 Community Factors explaining child mortality

Community factors affect child mortality differently among ethnic groups because they have their own unique ethnic style. They have their own pattern of migration and have settled in different geographical area. For example, the Karen usually settles in hilly areas, whereas the Mon is most likely to inhabit a river basin. The different geographical setting has an effect on physical environment, availability of food, and inhabitant's life style, including their health status, and health care seeking behaviors. The following sections firstly present the community context of Karen and Mon villages. Though both villages settled along the Thai-Myanmar

border, there were some distinct circumstances that led to the differences in child mortality.

The community context of Karen and Mon villages

4.5.1 Geographical setting

The Karen village is one of several Karen villages located along Thai Myanmar border of Kanchanaburi province, approximately 60 km from the border. It is easy to walk across the border from Myanmar to this village within one day. Therefore, new Karen migrants are constantly settling in this village. At the same time, Karens in this village often go back to visit their relatives in Myanmar. This village is located in a hilly area above Vachiralongkorn dam (Khao Leam Dam), and is about 22 km from Thongphapume district. The village is almost completely surrounded by river; the rest connects with thick forest which is difficult to access. It seems that this village is cut off from the outside world. The village can only be accessed by water transportation.

As the old people recount, this village was settled by Karen more than one hundred years ago and it was named in Karen language. After the Thai government constructed the dam in 1984, the previous location of the village was partly flooded, so the pioneer group moved to other villages where the government offered some land to them for resettlement. Nevertheless, a few households remained in this village and shifted to upland areas (recent location of the village). After that, new groups of Karens started to move in from Myanmar to settle in the village with the existing group. Nowadays, most inhabitants are migrants from Myanmar and their descendants who moved after the village was relocated.

The Mon village is also located near Thai-Myanmar border, and is about 30 km far from Sanglaburi district and about 17 km far from the border. There is one immigrant check post situated on the way from the village to the border. Migrants, who want to enter Thailand need to obtain legal permission. Legally, they are allowed to stay for 15 days in Thailand or commute daily. This village is close to Mon refugee camp located in Myanmar supported by a non-governmental organization (NGO).

Many Mon migrants pass through this village as it serves as a labor market for Mons who are seeking job and is a transit area for Mons who are planning to move to inland villages. Even though there is a check post, they evade it by using an alternative track rather than using the main road. They can reach this village easily in only half a day.

Initially, this village was formed by Mon people. After the dam construction, the village was arranged for Thais and Thai Karens[3] whose home had been affected by flooding. Consequently, undocumented Mons had to move out from the village. At present, Mon residents in this village are those who had moved from other Thai villages and from the refugee camp. The majority of them are only temporary residents. Only 5 households have remained in this village for over the past 15 years, while the others have migrated to other Thai villages or moved back to Myanmar. In the past, this village had a Mon name. After Thai people moved to this village, they refer to it in Thai but with the same meaning as in the Mon language.

A number of people in the Karen village is higher than the Mon village, with about 1,100 inhabitants in 192 households. The proportion of Karen people (90%) in this village is higher than other groups. The proportion of native Thais is less than 1 %, and the rest are Mon. The majority of villagers are Christian, with only 10 percent being Buddhist. Most of them rarely move from place to place. The majority moved directly from Myanmar to settle in this village and only one-fourth of Mons moved from other Thai villages. On average, they have been in Thailand for 15 years. The minimum duration of staying is 5 years. Most Karens have hilltribes ID cards and Tor Ror 38/1 documents[4], and recent migrants are mostly documented by the survey form[5].

With regard to the Mon village, it is different from the Karen village as the proportion of Mon is much less than Thai people. Of 200 households; 107 are Thai, 13 are Thai Karen, and the remaining 80 households are migrant households (68 are Mon and 12 are Karen). All are Buddhist. In this village, Mon is considered as the minority group; hence, the local authority has arranged a section of the village for Mons, known

[3] Karens who are already granted Thai citizenship.
[4] Temporary ID card is issued for migrants who register as temporary residents.
[5] It is just a simple form recording the number and little information of non-Thai who stay in the village at the time of the survey conducted by local authority.

as ***"Mon compound"***. Some Mons remain scattered throughout the village either in croplands of Thai employees or in forest conservation areas as labor of the Forest Protection office. Compared with Karens, Mons are frequently mobile; 80 % of them had moved at least 3 or 4 times before settling in this village. Because of their mobility, 1 in 3 does not have any legal documents.

4.5.2 Community Organization

The local organization in the Karen village is similar to other villages in Thailand. It is authorized and organized under the Thai official administration by a village headman and assistants, local sub-district administrative officers, and border patrol polices. Most leaders are Thais who do not live in the village, and only two are Karens with Thai nationality. Because this village is located near the border and remote from other villages, a border patrol police office has been set up to protect the territorial integrity of Thailand and provide security as well as patrol the borders.

Similarly, the community organization in the Mon village is also administered by local authority, but there is no border patrol police office. All of the leaders are Thais. As mentioned above, Mons stay in the village as migrants and they frequently move, thus the local authority has established a system to record the list of migrants who move in and out, including information of birth and death. Moreover, local authority promoted some Mons to be a leader and assistants to take the responsibility to ensure peace, cleanliness, and security of life and assets in Mon compound according to the Thai civil law and community regulations. The local authority also encourages Mon leader and his assistants to join the monthly village meeting so as to serve the Mon leaders as a communication link between Mon villagers and the local authority. Among Mon, they also arrange meetings every three months.

4.5.3 Transportation

Access to the Karen village is uncomfortable. It is difficult to get there by car as there is only an old track which has been used to transport timbers from Myanmar to Thailand over the last several decades. Generally, Karen villagers travel by boat. There are only about 10 boats in the village. Some are used for personal travel and

some are used for business purposes; transporting villagers from the village to pier. It takes two hours to reach the pier and it costs 80 baht for each trip. Normally, villagers travel in the morning because the water is calm at this time. They often avoid traveling in the late afternoon, at night and even in daytime if there is strong wind or heavy rain as they are afraid of accidents, except in the case of emergency such as children with severe sickness or obstructed delivery. Within the village, there are small trails and only 200 meters of concrete road, so villagers usually travel by foot.

By contrast, transportation inside and outside the Mon village is more comfortable than the Karen village. The distance between the village and the district of the two villages, is much the same. Yet, the Mon village has better transportation facility than the Karen village. There is 22 km asphalt road from the district connected with a village road. The village road is about 11 km from the main road and is mostly made of gravel with only 2 km near the village made of concrete. Bus services are unavailable in the village. If villagers want to go to the district, they have to use motorcycle services to get the bus at the main road with a service charge of 50 baht. Typically, the bus is available every 30 minutes and costs 30 baht. Some Mons have their own motorcycle that allow them to travel comfortably. Also, Mons can join a pool car with Thai villagers when they need to do things at the district.

4.5.4 Physical infrastructure

Because of its remoteness, public utilities and infrastructure in the Karen village are less developed. In the village there is a Buddhist temple, Christian church, child care center[6], primary school operated by hill tribe welfare center[7] and non-formal education. The village has no electricity, however, the government has provided a solar energy plant at the center of the village. Villagers can recharge their battery from the solar energy plant and use it to generate electricity in their households. Water is obtained from a mountain stream. Each household collects water through pipes for domestic purposes and drinking. There are no television or phone services in this

[6] This center takes care of children aged 2-5 years under an administration of sub-district administrative organization.
[7] This type of school is not accredited by the government.

village, so it is very difficult for the villagers to get any information from the outside world. Despite this, 2 or 3 rich households do have televisions for watching videos and have created antennas to receive mobile phone signals.

There are 5 small grocery stores scattered around the village which mostly sell food stuff, snacks for children including some basic medicines. As Karens earn their living by gathering and hunting, just only few kinds of fresh vegetables like long beans and cabbages are sold infrequently. Similarly, no fresh fruits and meat are sold in the village because of high price and no refrigerator to preserve them. The variety and quantity of food in this village are limited depending on occasions that the villagers can hunt and gather food from the forest.

Though, the physical infrastructures of the Mon village are somewhat similar to that of the Karen village, its infrastructural development is better than Karen village as the majority of residents are Thai and it is in an accessible location. All public utilities: electricity, water supply, public telephone, and television signal are provided. Therefore, the villagers can easily get information and communicate with people outside the village more easily than the Karen. Furthermore, in the Mon village, many public service stations are available including a child care center, a governmental primary school, a temple, a forest conservation office, and malaria screening unit. There is one food shop and 6 groceries, 3 Thai and 3 Mon. The kinds of goods sold in the groceries are similar to the groceries in the Karen village, but the quantity and variety are higher.

Additionally, mobile food venders[8] come to Mon village twice a day (in morning and in evening) to peddle fresh food like vegetable, fish, pork, and chicken, including sea food. Each month, groups of traders also come to sell cloth, food stuffs and household items in the village. Moreover, venders from stores in Sanglaburi district come to sell electric goods, door to door, on an installment payment basis, such as televisions, radios, electric fans, electric pots, as well as satellite dishes. Mon people also prefer to buy goods by installment.

4.5.5 Health care system

[8] A car or motorcycle is modified to carry foods for peddling purpose.

Information on health problem collected from the local authorities, district health officers, health center officers, including village healers indicates that Karen children mainly suffer from infectious disease especially malaria, common cold, pneumonia, diarrhea, parasite, and skin disease. The health problems of Mon's children are similar to that of Karen children, but the incidence is less. They mainly suffer from common colds, pneumonia, skin disease, and diarrhea. In the past, they suffered from malaria, but now the incident rate is gradually decreasing.

There are no health stations located in the Karen village. The health center which is responsible for this village is far from the village and is more difficult to access than the district hospital, so in the case of severe sickness or emergency, Karens usually go to the district hospital. Generally, it takes 2 hours by boat, and 15 minutes by bus from the pier to the hospital. Even though, this area has a high prevalence of malaria, the malaria screening unit is located not in the village, but on the route between the village and the pier. Health officers from this unit provide blood tests for the detection of malaria in the village every 1 or 2 months. Villagers who get sick and are suspected of having malaria outside the period of an outreach services, have to go to malaria unit by themselves. The check-up takes one day, thus after having blood test, the patients have to come back and wait for diagnosis at home. Around 1 or 2 days later, the health officer informs the result of the blood test and sends medicines to the patient through other villagers who visit the malaria unit.

However, the inhabitants in the Karen village are not totally left behind. The government still looks after this remote area. Over 4 years, the largest volunteer medical service named *"The Foundation for Voluntary Medical Services of the Princes Mother"* has been established for this village and provides treatments for the villagers twice a year. In addition, health staff of the district office also realized the problem of health service utilization and accessibility among this group. For 2 years, the district health office has been collaborating with the health center to operate a mobile medical unit providing general treatment, family planning, antenatal care, and vaccination services for the villagers bimonthly. In addition, 8 health volunteers, both Karens and Thai Karens, are responsible to distribute health information and conduct

nutritional surveillance[9]. Also, they act as translators when the mobile clinic is operating in the village.

Traditionally, Karens take care of their illness using traditional herbal self care. Even though modern medicine from the mobile medical unit has been introduced to this village, some of them still practice the traditional methods, though it is steadily declining. Generally, when either children or adults get sick, they usually go to visit a village healer, who is trained by Karen Medics. He investigates the illness using modern medical instruments (e.g., thermometer and blood pressure monitor) and treats the patients with both modern and traditional medicines (e.g., herbs, injection, and intravenous fluid). Apart from general illness, the village healer also takes care of pregnant and post partum women and also provides family planning services.

Most births in the Karen village still take place at home attended by a traditional birth attendant (TBA). There are 7 TBAs aged 44 to 70 years, with only one male. Some TBAs learnt how to conduct delivery from their grandmother or relatives and some become TBAs by default when their neighbors were unattended during delivery, and needed help. Having helped their neighbor, other neighbors came to know about them and also sought help. Thus, they become known to the community and continue this service. Of all the TBAs, only 2 received training from professional providers, but both have now retired because of old age. Therefore, the remaining TBAs still active in birth attendance are untrained.

Apart from health services mentioned above, Karen people also seek the treatment from two sacred healers. Both of them are blind. One became blind due to complication of measles in his early childhood and the other lost his eye due to injury by Burmese solders in his early adulthood. They use herbs and magic spells to treat several diseases, such as fever, muscle pain, stomachache, *komoh kapha* (its symptom seems as malaria), *tacha phutha* (children illness), *ta ku thor* (white plaque in a mouth), including obstructed labor. They learnt this technique from monks. Following

[9] This program was just functioned for one month before the fieldwork operated.

the availability of modern medicine in the village, Karens are gradually avoiding this kind of treatment.

In the Mon village, there is no health care station similar to Karen village. Nevertheless, Mon have more choices in health care than the Karen. The nearest one is a health center, which is 13 km from the village. Mons usually visit this center for child illness treatment, vaccination and antenatal checkups. Also, 18 km from the village, there is an NGO run private hospital supported by a Christian mission agency. This hospital was established to treat villagers living in the surrounding areas, including migrants along the border. Some health providers at this hospital are Mons and Karens who have been trained to provide health services. Hence, Mon villagers feel comfortable to visit this hospital as some health providers are of the same ethnicity and can communicate in the same language. In addition, the private hospital is flexible in terms of payment. If Mon patients cannot pay the full cost of the treatment, the hospital authorities allow them to pay as much as they can afford. Furthermore, Mons can seek health services from a district hospital, which is 30 km from the village. It is not popular compared to the other health stations already mentioned. Mon villagers often visit the district hospital in cases of severe sickness as it is specialized in severe diseases management. The travel cost to each health station depends on distance; it cost about 50-70 baht, 100 baht, and 200 baht for the health center, the private hospital, and the district hospital, respectively.

Fortunately, a malaria screening unit is located in the Mon village. Two health volunteers are trained to do a blood smears, use microscope, and prescribe treatment. This unit uses a new technique to detect malaria infection (Para check), so patients can get quick diagnosis and treatment without delay. This unit also provides basic medicines for villagers who suffer from simple illnesses such as stomachache, common cold, helminthes and diarrhea. Very few Mons visit this unit to consult with health volunteer and get some medicines as most of them prefer to be checked by professional health service providers rather than the health volunteers.

This village has 9 health volunteers; 2 are Mons and the rest are Thais. Their responsibilities are to provide health information, to measure weight and height of

children every three months and report to the health center. Attending birth by TBA is not popular in this village. There are only 3 untrained TBAs: one is very old and stops providing services several years ago; the other 2 TBAs are still active, one is Mon and the other is Karen. Besides these, this village also has one traditional healer who is Thai Karen. He uses herbs and magic spells to treat both children and adults, especially for common colds, stomachache, muscle pain, jaundice, discomfort, including illnesses that the patient believes it caused by supernatural powers. He learnt this kind of treatment from his father in law. Now most of villagers prefer to be treated using modern medicine. Only a few patients visit him each year, especially when they needs holy water to treat their baby's stomach pain. Most of his patients are Karen. Mons rarely visit him.

Regarding to health insurance system among ethnic minority, in the past the minority groups were uninsured by the system. Since 2001, Thai government has been introduced universal healthcare coverage ("30-baht") plan, which mainly covers all Thai people. Minorities are also eligible for this plan if they hold ID card for hilltribe (Blue and pink colored card). Under this scheme, however, a health insurance card is for their personal use, and excludes their children. Despite its aim to provide health services to all gold card holders, obtaining health access is complicated. Applicants need to present an ID card for hilltribe and/or housing registration in order to obtain health access which many Karens do not have, or have lost, or get confused with the requirements and, in turn, are ineligible for this scheme. Still, uninsured minorities are able to access a personal health insurance card for displaced person, (cost 700 baht) and a household insurance card for displaced person (cost 1000 baht) covering maximum of 4 members of a household. These insurance cards are valid for one year only. Because of financial hardship, only 8 Karen households hold valid household insurance card and only one Karens hold a personal health insurance card. The Karens who bought these cards realize that they may obtain most benefit from these cards whenever they or their children get sick, the cost of treatment will be covered by the cards. Few Mons hold health insurance cards compared to Karen. Most Mons do not know about the cards and source of purchase. Only 2 households and 1 person have obtained health insurance card for displaced person. However, Karens who hold

insurance card rarely use health services, except for severe illness. Although the treatment cost is covered by health insurance card, they still have to pay for travel costs and other expenditures that may be higher than the cost of treatment.

4.6 Household factors underlying child mortality

As mentioned, household factors play an important role in child health as the family perceives as a unit that allocates resources for nutrition, and provides health care and sickness care for children. Furthermore, the values and norms of its members also influence child health and survival.

4.6.1 Economic status of a household

Karens practice subsistence living. Their life style is related to the natural resources and environmental context. Almost households cultivate rice for their own consumption, and even those households which do not own land are allowed to cultivate in the paddy field of the neighbors without paying in kind or cash. Apart from rice, other food stuffs are obtained from the forest. For instance, Karen females usually collect local vegetables, such as *krud, saba, nham,* roselle, and sour cucumber for their meals. Few of them cultivate vegetables around their houses and paddy fields. For meat, hunting is the duty of males or heads of household. Unfortunately, as the number of wild animals is gradually decreasing, the distances for hunting are extensive and far away from their compound and deeper into the forest than in the past. After the animals - such as *barking deer, deer, wild pig, civet cat, squirrel, turtle, snapping turtle, or hill frog* are caught, traditional ways of cooking are followed. Whenever the resources from hunting are beyond the needs of one family, a process of sharing exchange between relatives and neighbors is conducted in this village. Normally, they have to manage and finish those fresh foods in a day; they cannot keep these hunted foods for longer due to lack of electricity and refrigerator. However, sources of protein are not limited to the forest alone. Some protein sources can be found around the home as well. Research found that nearly half of them raise few pigs and chickens which roam freely in the village. Particularly chickens are breed for consumption, whereas pigs are sold as income.

Although, Karens maintain their living in a substantive way, modernization and transitional changes are affecting their cultural life as well. Living expenditures for everyday life are continuously increasing. Each month approximately 200-500 baht is paid for their cooking ingredients such as shrimp paste, salt, sugar, oil, and seasoned powder. Especially for new migrants who have no land for cultivation, rice is an important food for purchase. Even though households cultivate rice for their own consumption, they have to buy or borrow rice from their relatives or neighbors. Their products are insufficient for the entire year because the land has become less fertile and using of chemical fertilizers is an unusual agricultural practice for the Karen.

Additionally, miscellaneous expenses are necessary to pay for their livelihood, encompassing personal utility (e.g., soap, shampoo, and toothpaste), water fee (2 baht per month), battery charging (5 Baht per time), tuition fee[10], and pocket money for the children when they are going to school (1-2 Baht per day). As a result, head of households have to earn income to support their families. Most of them work as a labor in agricultural field for their neighbors or for capitalists who live outside the village, such as farming, cropping, and cow breeding, with a wage rate of about 100 baht per day. Others earn income by hunting, fishing, and gathering. However, these kinds of supplementary occupations depend on seasonal factors and hunting some wild animals is prohibited by law.

In this research, Karen household income is 1,100 baht per month, on average. For agricultural households, monthly incomes are 400-700 baht (including the money from supplementary occupation), while income of those households with wage-based occupations is considerably higher, approximately 1,000-2,000 baht a month. Noticeably, households which have had a child who has died at aged less than 5 years, have lower incomes than the average, at about 900 baht per month. Also, their income is half less than households with no experience of child death. Nearly half of Karen households have debt of about 600 baht; they mainly borrow from their relatives to buy rice, and food stuffs. Some household borrow the money from commercial money

[10] Children aged less than 5 years who attend a day care center in the village, the parents have to pay 120 Baht per head / per year. While the children who study outside the village, the expenditures are increased to 300-500 Baht per month.

lenders for economic cultivation (e.g., cassava), health insurance cards, or medical expenditure when the children get sick.

With regard to household wealth by asset, the majority of Karen possesses very few household assets, only simple domestic appliances, which are necessary for their daily life. Their houses are mostly simply constructed with temporary materials (bamboo and cogon grass). Only one quarter of Karens who are granted Thai nationality own land and have higher economic status than the others. Their houses are built using solid materials. Further, they own some luxury goods, such as television, video, and battery to generate electricity in their house as well as boat for personal transport.

In sum, those Karen households whose head of households were born in Thailand, get Thai nationality, have intermarried with local Thai, have been in Thailand for long time, or hold hilltribe ID card, have a higher economic status and have more rights than others. This group of Karen has more opportunities to obtain land, attain higher education, get a job in local administration or civil department[11], and obtain social welfare[12].

Economic status of Mon households is comparatively different than that of Karen. Their living cannot depend on natural resources like Karen. Mons do not have their own land, all land belongings to Thai and Thai Karen. Recently, over 1000 rais of unused land was sold to southern Thais for rubber plantation. Consequently, natural resources are not rich in this village. Mons can gather only few kinds of local vegetable for their food. In addition, the forest conservation office vigorously enforces protection of wild animals and natural resources. However, this village offers a good chance for Mons to participate in economic activities, due to particularly large commercial plantations together with small scale factories producing Thai traditional

[11] In this village, Karens with Thai nationality work as local administer, and care giver in the day care center. Their salaries are 5 times higher than their Karen without Thai nationality counterparts.
[12] In this village, for example, a small solar energy plant which supports by the government is distributed for the villagers who have Thai citizenship only.

broom operated in this village. Thus, lots of labor is needed for production activities everyday and throughout a whole year and so it is easy for Mon to earn income.

The occupation of Mon is mostly wage-based. Mon males mainly work as labor in rubber plantations, cassava fields, and cattle breeding. Surprisingly, almost all Mon females also participate in the labor force; only 18 percent of those have to quit their jobs to take care of their babies. Mon females work in factories to make brooms and work as labor in fields. According to empirical data, it seems that Mon have greater social interaction with the outside world than the Karen. More social interactions among Mon are linked to increased living expenditures which have become much higher than the Karen. This has led to Mon wives being forced to work for more money to support their families.

The average monthly income of Mon household is 3,377 baht which is 3 times higher than the Karen, but the living expenditures are comparatively high as well. Rice is basic necessity to buy among Mons as they have no land to cultivate rice for their personal consumption. Also, they have to pay 20-50 baht daily for fresh food, 20-30 baht monthly for water supply, 200-500 baht monthly for electricity, and some pocket money for their children. Moreover, they spend some portion of their income to make merit, at least 3-4 times a year. This research confirmed to say that Mon beliefs and practices are devoted to Buddhist religion. They actively engage in religious activities as basis of their cultural way of life. For example, going to the temple and offering food to the monks is done on every Buddhist holy day. Besides that, they have to pay monthly installment with a charge of 10% interest for their electrical goods.

When the financial status of Mon is investigated, the research found that 85% of them typically owe around 3,000 Baht per month. The majority of debt goes through their food and luxury goods that they stored from village grocery, mobile food shop, and electric shop in Sanglaburi district. Some of them also borrow money from their employers to spend for treatments when their children get sick. Saving money are found in few Mon households.

Mons have some valuable household assets, for example televisions, videos, satellite dishes, fans, electric rice cooker post, wardrobes, and motorcycles. These

valuable assets are found in Mons who have lived in this village for more than 10 years, whereas recent Mon migrants have collected very few assets. Typically, Mon houses are built with temporarily materials, mainly using bamboo, and roof with cogon grass.

Although, Mon has high expenditure and debt compared to Karen, they are also concerned about their children's health. Most of them visit antenatal care when they get pregnant, give birth attended by professional health providers, and take their children to get vaccination and physical development checkups, even they have to pay for these kinds of medical services, including travel costs.

4.6.2 Women's status

In traditional Karen society, the kinship lineage is matrilineal, but Karens in this village are Christian. They do not follow the traditional practices. After getting married, a new couple moves from their parents' house to establish their own household. Most Karen families are nuclear families composed of father, mother and their children. The gender role of Karen is similar to other societies in general. The roles and tasks of fathers and mothers in a family are clearly defined. The man is the head of the household and works hard as a breadwinner to support the family. His duties are to work in the fields, build houses, prepare roofs, and hunt for food. The woman caters for the basic needs of the family. Her main duties are housework included cooking, washing, collecting firewood, cleaning, and taking care of the children as well as doing agricultural work; planting, weeding, harvesting, carrying the harvest home and storing it. Few women have to help their husbands to earn a living. Though housework is the duty of the Karen wife, it is not uncommon for her husband to attend to the housework. Karen husbands often help their wives in cooking and taking care of children if they have free time, or when their pregnant wives are nearly due. Moreover, husbands usually take all responsibilities during the post partum period when their wives take "*ler ku*" (staying on the fire)[13]. During this time, the

[13] "*Ler ku*" is a traditional practice among Karen women after giving birth by putting warm stone wrap with "*ku va ra*" (one kind of herbal leaf) on an abdomen for at least 7 days to 1 month in order to secrete logia.

husband stops work and takes care of the children and wife by cooking, feeding and bathing the children, keeping the fire to warm the stone for *ler ku*, and also washing the blood stained clothes of his wife. The husband has these duties for 1 week to 1 month depending on the *ler ku* period. In Karen studied village, there is no demarcation of duties between male and female; a man can do household activities or woman's work. Gender's roles are flexible, according to need.

"After I gave birth, when I took ler ku, my husband cooked for me, fed and took care of the children and he also washed clothes, even it was stained with my blood. He did like this in all my pregnancies."

(Karen mother aged 29 having 3 children)

Karen females have autonomy to control and allocate household resources. All income earned by the husband is maintained by the wife. If husbands want to use some money, they have to ask it from their wives. However, males participate in community activities more than females. They mainly act as household representative at the monthly village meeting and in community development activities. However, Karen females also have some activities outside the house, though not the same as males. For example, they participate in the village organization,[14] religious committees, as health volunteers, and village representatives to welcome formal guests.

"Any topic within a household, I have more power to make a decision, but my husband has more power to make a decision outside the household. He mainly joints the village meeting."

(Karen mother aged 27 having TR 38/1, no schooling)

"I am maintaining all financial issue in my household. My husband gives me all his money and I take care of it. I spend money to buy some food ingredient like salt, oil, shrimp paste, and so on. If my husband needs to buy some tobacco leafs, he has to ask the money from me."

(Karen mother aged 35 years, born in Myanmar having hilltribes ID card, no schooling)

[14] The whole village is organized into 6 administrative parts. One leader is promoted to watch over each part which consists of 30 households. Among 6 leaders, two are females.

Generally, decision making between Karen husband and wife is based on mutual respect. Any decision making on family issues, such as changing the location of a house, or to build a new house, are usually discussed together. Also, they made decisions jointly when they send their children to school or allow them to work in town or marry. Regarding to health care for their children, if the child suffers from a mild illness, the wife can make a decision by herself either to buy medicine from a grocery store or use herbs. But in the case of severe sickness, if the child has to go to hospital for treatment, the wife has to discuss with her husband about expenditure and travel. Apart from children's illness, for antenatal check up or delivery at a hospital, the Karen wife has to consult with her husband as well, even if she realizes that such activities are crucial. By all accounts, any decision which is related to high cost, either treatment or travel, the wife cannot decide by herself, and needs to discuss with her husband.

"My wife could not make a decision alone. When we took our child to the hospital, we knew….we had to spend a lot. We earn only 200-300 baht a month. It was not enough. We had to discuss together about how to get the money or from whom we could borrow the money."

(Karen father aged 33 years, a three years child was suffered with high fever and stomachache last 3 months)

The in-depth interviews also reveal that most Karen women have autonomy in decision making on contraceptive use. After family planning was introduced to the village, Karen females gradually increased the use of contraceptives. Whenever Karen women want to stop or to extend the duration of birth spacing, they can make a decision to choose a temporary contraceptive method, pill or injection, by themselves without informing their husband before using. Even if the husbands find out after their wives have already used contraceptives, they accept it and do not disagree with their wife's decision. In the case of permanent methods, such as sterilization, all wives have to consult with their husband before making such a decision. They well realize that it is an important issue and most still prefer lots of children, particularly the husbands.

"I came to know from my neighbors about contraceptives. I do not want to become pregnant any more. I want to use it. I started to take the pill and did not let him know. Later, I told him and he didn't say anything."

(Karen mother aged 32 years having 6 children and using oral pills)

"I had 4 children and I think that those were enough for me. So I wanted to do sterilization and discussed with my husband about this issue. My husband agreed and allowed me to do it, if the doctor says that I was eligible for sterilization. I had sterilization 4 years ago."

(Karen mother aged 29 years, she was born in Thailand and have a blue card)

It should be noted also that Karen women are confident to terminate an unwanted pregnancy. Several women still refused to use contraceptives even though they did not want to have more children. When they got pregnant, most of them continued their pregnancy until delivery because they were afraid of sin. On the other hand, some of them made the decision by themselves to abort without informing their husbands, because they knew that their husband would strongly disagree with them and might blame them.

"When I tried to abort my 6th pregnancy, I did not let my husband to know. I kept a secret. I drank the Thai traditional solution that is usually used for menstrual problem, to make it regular or to expel logia after childbirth. Actually, a shopkeeper would not sell it if he had known that I used it for abortion. If my husband knows he would be angry with me and tell me to die with my baby."

(Karen mother aged 39, no schooling, having 6 children)

According to the qualitative data, an interesting finding was that 16% of Karen women remarry 2 or 3 times. They remarry because of their husbands' death or separation. The second or third times mainly occurred after they moved to Thailand. During observation and interview, it was found that most husbands accepted their remarried wives without problems. The husbands gave information about marriage history to the interviewer openly. They think that it is not a private issue and they also

take care and treat the children of their wife's ex-husband equally as their own children.

It seems that Karen women have high status in their household. No cultural belief limits their freedom. Most of them have autonomy and can freely make decisions on health for themselves and their children.

Mon is a group that holds patrilinear lineage; sons have to take care of their parents' spirit *(kalok hoe).* The *kalok hoe* kin group consists of all male members of a given lineage. This spirit dwells and is maintained in the home of the eldest male member of the family. When they die, descent follows the male line. Therefore, if any Mon family does not have a son, they are afraid of not taking care of the spirits. Males in Mon society have a higher status than females. This traditional norm is also found in the Mon village. Further, male status is also related to religious belief; males can convey their merit to their parents through ordination. Mon females are always trained and advised by their parents and elders to show respect and to be obedient to their husband. This cultural practice can still be seen in the village to this day, even among the young generation who ever worked in urban area.

"I see my husband as my elder brother and I am his younger sister. We are women, we cannot imitate male. He has higher status than me. Every night before I go to bed, I have to wai (perform respect) his mattress. My mother taught me, if I do not practice like this, it will affect our family well-being, and the others will think badly of me."

(Mon female aged 30 years who had ever worked in the urban fringe for several years)

Most Mon families in this village are nuclear in nature. Their parents or grandparents live in other villages and some still live in Myanmar. The gender roles of Mons are not different than those of Karens and others. But Mon wives also help their husbands to earn money in addition to doing their housework and taking care of children. They earn about 40-50 % of household income. Mon wives are mainly responsible for household financial management. They allocate money for food, child care, treatment and health service utilization. Husbands obviously have more outside household activities than females. Males always are a representative of a household in

the community meetings and participate in decision-making on community issues. Even if male status is higher than female, they make decisions equally. Husbands and wives usually discuss together before making any decisions. However, the important issues or final decision is primarily made by the men.

"My husband has more power than me. He is my husband, so I must listen to him. He would like to have a baby, but I do not. I prefer to work. Anyway, I just have one!"

(Mon wife aged 21, she was born in Thailand with husband aged 22 years)

Regarding health care utilization, the majority of Mon females can seek health services by themselves. They can go to the health station for antenatal care, delivery, family planning services, and treatment for sick children. Though some of them need permission from their husbands, they do not face any problems. Most husbands often support the decision-making of their wives because Mon males are also aware of the benefits of health care services.

4.6.3 Value of children

Perceptions of value of children in Karen and Mon society in this study are expressed in three dimensions. Firstly, children have value in terms of satisfying psychological needs of parents (emotional value). Not only parents but also other members in the family feel happy with a new baby. Karens show positive thinking about having many children through their traditional beliefs that having a child is a process of transition to parenthood for a new couple. Karens believe that if a couple has more children, they will get more experience and responsibility, which may bring them to be mature parents.

"My mu (mother) told me that whenever we have one child, we have just opened one eye. If we have a second child, we open the other side. With two eyes we can see the world broader and brighter. For the third or more child, we will experience enlightenment!"

(Karen mother aged 30 years)

Similarly, Mons also perceive that having children allows them to have someone to love and care for. Additionally, in Buddhist Mon's own way, Mon children carry value related to the religious belief. Performing in Buddhist ordination by sons can confer merit on the parents. They believe that this great merit would support parents to live in a heaven in their life after death. Thus, this belief affects the number of children and son preference among Mon. However, in relation to their economic conditions, most Mons try to limit the number of children. Still, the majority of them prefer to have at least one son to accumulate their merit.

"My husband is eager to have a son for his merit. We are holding this belief. Now I have only one daughter, but I intend to have 2. If my next child is a daughter, I will continue to another pregnancy. Anyway…… having many children is tough. We do not have enough money to raise them".

(Mon mother aged 30 years, no schooling, having 1 daughter)

Two other dimensions are socio-normative value and economic value. Regarding these values, Karens are divided into two groups according to their different perceptions. The Karens in first group perceive that children have value because parents will get future support from them. Their expectation depends on their children's labor and support, because when their children grow up, they will provide comfort and care to parents in their old ages. Also, they report that having many children is not a burden and does not create any difficulties for them. Karens who have many number of children (4-6 children) expressed this perception, their age on average is 30 years old. Most of them have migrated to Thailand for less than 15 years.

"We would like to have 10, 5 sons and 5 daughters. If we have few children, we will not have enough helping hands to help us for housework and earning money. Also, when we become old, we will not get enough support from them."

(Father aged 40 years (grade 1education), mother aged 36 years (no schooling). Both of them have lived in Thailand for 7 years)

"We already have 4 children and we think that this number is good and fit for our family. If some of our children become sick and die, we will have fewer children, so we

prefer 6 children. Lots of children is good for parents as they will take care of us and will earn money to support the family."

(Father aged 44 years (no schooling). Mother aged 39 years (no schooling). Both of them have lived in Thailand for 11 years)

Karens in second group who had a fewer number of children than the former group perceive that even children are worthy for them in terms of emotional and social value. They have to spend lots of money to raise their children from the time they become pregnant -to pay for antenatal visits to ensure their baby's health- until they become active adults, especially, school tuition fees and cost of treatment when they get sick. Nonetheless, this group also expects repayment in terms of money support and care from their children, but this expectation is not as high as that of the previous group. Karens in this group mostly are from the young generation aged less than 30 years old, and have only 2-3 children. Most of them had ever worked in urban areas and attended Thai school within and outside their village.

"I think that 3 children are enough for me. If I have more than 3, I have to spend a lot of money for them. Now all my three children are studying in pre- school. I have to spend 120 baht for each child per year. With this number, if they are grown up and become active, they could support us effectively."

*(*Father aged 30 years (grade 3 education in Thai school), born in Thailand, mother aged 27 years (no schooling), has lived in Thailand for 11 years)

"I think that I and others who have a fewer number of children are happy with the lower number of children because we do not intend to depend on them in the future. If we have many children, we will face difficulties as we have to spend a lot for their education, food and other expenses."

(Karen mother with Thai nationality married with a Thai border patrol policeman aged 26)

"My husband and I want to have only two children, as we want to support them to have a high education as much as possible. If my children could be highly educated, they will not suffer like us."

(Karen mother with Thai nationality and married with a Thai man aged 24)

On the other hand, a higher proportion of Mons report that they perceive negative economic value on their children compared to Karens. Indeed, Mons are also concerned about care and support that they may get from their children when they are too old to work or care for themselves. But the Mon's life style and their economic circumstance is different than Karens, while their economic hardship reduces the importance of this value. The majority of Mons prefer to have only 2 to 3 children because they are concerned about the expenditures of child rearing.

"I want to have four children, but now I have only two. If I can afford it, I want to have four. If not, only two is enough. It is difficult to rear the young children, but when they grow up, they can share our burden."

(Mon father aged 22 years and born in Myanmar with no schooling)

Beyond the value of children as mentioned above, this study found that the gender of children also affects the value of children. Conventionally, traditional Karens believe in matrilineal lineage, therefore, the daughter will continue their clan. But the Christian Karens in studied village do not follow this tradition. There is no gender dominance in their attitudes. Sons and daughters are treated equally. Evidently, Karens prefer both sexes of children as they perceive that males and females have their own superiority. A Son can help parents to do hard work in agricultural farming, whereas a daughter can do housework like cooking, washing, and cleaning. Even those parents who do not expect labor from their children also prefer both sexes. The empirical data shows that some Karens who already have many children, including some Karens who intend to have only 2 or 3 children, are pleased to continue their pregnancies, if they do not have children of both sexes. Some of them try to achieve their desire by continuing to get pregnant only 1 or 2 times, but some continue their pregnancies until they meet their desired sex. This kind of practice attributes to high fertility and short birth spacing among Karens.

"I think that males and females are equally important. Sons can help a father in outside activities, while daughters can help a mother in housework. We do not expect that when I and my wife become old, sons or daughters will take care of us. Any… irrespective of sex."

(Karen father aged 38 years)

"A few years ago, I had three children. All were daughters. I need to have children of both sexes. Luckily, I got a son in my 4th pregnancy. If I did not get a son, I would continue my pregnancies until I meet my desire."

(Karen mother aged 30 years)

Similarly, Mons prefer both sexes of children; even though a son has more value related to religious belief and patrilineal lineage. Mons still give importance to a daughter and prefer to have a daughter. The Mons give similar reasons for their wish for daughters as those of Karens: daughters are suitable for housework and can take care of parents more sympathetically than sons. In addition, Mons perceive that daughters also have the ability to earn money to support a family, even though they cannot do hard work and earn as much money as a son does. However, Mons do not continue their pregnancies to achieve their desire for both sexes.

"A daughter is also important, even if only a son can perform an ordination and can maintain 'kalok hoe' (household spirit). Two genders are different and have their own optimistic side. As my wife, she can earn money to support our family."

(Mon father aged 30 years, born in Myanmar, no schooling, ever worked in Bangkok for 2 years)

In short, Karens express a more positive value toward all aspects of their children than Mons. Whereas, for Mons, although their children have a positive value related to religious and traditional beliefs, the value of children in economic terms is somewhat reduced. This kind of value obviously influences the number of children among the two groups. However, this value does not affect child mortality directly, but its effect contributes to child mortality through risky fertility behaviors, which are described further at the individual level.

4.7 Individual factors predisposing child mortality

At the individual level, this study is focused on maternal behavior, which is also closely linked to child survival chance. It is already known that mother and baby has a biological link from the time the mother becomes pregnant until childbirth. In this study, maternal behaviors mainly focus on fertility behavior, health care practices and health care seeking behavior during pregnancy and delivery.

4.7.1 Risk fertility behaviors

The risk fertility behaviors contributing to child survival chance are described as follows:

4.7.1.1 Age of mother at childbirth

One in three of Karen mothers were less than 18 years of age when got first married. It already documented that marriage and giving birth at a young age is a greater risk to physically, psychologically, and socioeconomically immature mothers, and in turn affects child health and survival. One case from the fieldwork in the Karen village reveals that the physical and psychological immaturity of a too young mother may have caused a child's death. This mother married at the age of 14 and got her first pregnancy at age 15. She did not attend antenatal care at a health station, so she did not know her exact gestational age. She had her labor pain during the night when she was alone at home because her husband went out for hunting. Her baby was born in the early morning nearly the time of sunrise. Although it was her first pregnancy, she delivered her baby smoothly. After delivery, the baby cried and had some movements. She was too young to know about delivery management, so she did not do anything, even cutting the umbilical cord. She just lay down and waited for dawn. She was expecting that when someone, either a relative or neighbor, would come to visit her, she would ask for some help from them. During the time when she was waiting for someone, her baby's crying sound was gradually diminishing. Around one hour after delivery, her mother who lived in another house, came to visit and found that she had already delivered. Then, her mother went to call TBA to cut umbilical cord and to

bathe the baby. While, the TBA was bathing the baby, the baby stopped breathing and then died.

Conventionally, Karens in this village perceive that delivery is a natural process, thus they do not do any preparations. They call a TBA at once when a mother has her onset of labor pain. In some cases, for mothers who have had several delivery experiences, their subsequent deliveries occur shortly after getting labor pain. In these cases, the TBA sometimes could not reach them on time to attend birth and pregnant woman delivered her baby alone. According to the data from in-depth interviews, this phenomenon is not uncommon in this village. For example, one mother delivered her third baby when her husband went to call for a TBA. Thus, she told her three year old daughter to bring a knife from the kitchen and cut the umbilical cord by herself. In another case, a mother also delivered her baby alone in day time. She shouted to call someone to help her, and then her neighbor heard her voice and went to call a TBA.

Early marriage at young age was also found among the Mon. One in three Mon females married at age less than 18 years, but they did not have an experience of a child's death. This may be because after they got married, they used contraceptive methods to control their fertility for 1-3 years before getting pregnant. Additionally, almost of them attended antenatal care for all pregnancies regularly under the supervision of health providers, and delivered in a hospital. On the contrary, Karen women who were also married at an early age did not use contraceptive methods to delay the timing of their first birth. They also did not attend antenatal care, and their childbirths were attended by a TBA. In spite of these differences, both Karen and Mon children were at risk of death due to the early age of mother at child birth. Contraceptive use among the Mon couples extends the time till their first birth, which provided a chance to improve their physical, psychological, and socioeconomic conditions to get more mature and ready for having a first child. Moreover, attending antenatal care helped to prevent complications during pregnancy. Even if Mon mothers suffered from any complications, they could be managed on time. Moreover, delivery at a hospital also provided a safe delivery for them. This had brought about a healthy baby and reduced the probability of dying among Mon children.

"I got married at age 15. My mother said that I was too young, so I should not have a baby. She told me that I should accumulate sufficient money and gold before having a child. She also suggested to me to take the contraceptive pill. I used it for three years before having my first child."

(Mon mother aged 18 years, primary education in Thailand)

In this research, marriage and having a first birth at the age of over 35 years was not found among either the Karen or Mon; but 20 percent of Karens and 10 percent of Mons had a subsequent pregnancy after 35 years. There were no deceased children among this group of Mon mothers; but there was one Karen child that died. This mother delivered her baby when she was 46 years old. This child died at the age of 1 year. The cause of this child's death was not related to the physical condition of the mother, but it was related to child care. This deceased child died by drowning.

4.7.1.2 Number of births

Although, both studied ethnic groups perceived a high value of children, the Karen expressed more a positive value of children than the Mon, and also had higher fertility than the Mon. The average number of children was 3.7 for Karen and 2.3 for Mon. Furthermore, the Karen had a higher desired number of children of about 4, whereas the Mon preferred 3 children. Due to their expectation of old-age support from children, the Karen also had the perception of insurance and replacement- having more children to ensure the children who may die and to replace the children who died. This idea did not only arise among mothers who had an experience of a deceased child, but also among some mothers who did not. Karens often witnessed small children died in the village, hence they were afraid that their children may die.

"Small children easily get sick and easily die, because their bodies are weak and not matured. If I have only two or three and some of them get sick and die, I will have a small number of children. Who will take care of me when I get old? If I have many children and someone dies, it will still leave some."

(Karen mother aged 36 having 4 children, no experience of child death)

This study found that many Karen mothers had the experience of a deceased child more than one time. For instance, some of them experienced 3-4 children who had died, especially when they were living in Myanmar; some mothers had the experience of a child who died at every alternative pregnancy until the sixth to seventh pregnancy; and worst of all, one mother had delivered 5 children but only one child could survive, while others got sick and died at less than 5 years of age. It is noticeable that Karen mothers who had deceased children had a high number of children than those who did not have. The former had 5 children on average, and the later group who did not face this experience had only 3 children.

"My second child died in Myanmar when he was one year and a half. The fourth child died at the age of 3 years here (In Thailand). At that time, I had four pregnancies but only two children were with me. I was afraid if the rest die, I will have no child. My husband was also afraid. If all of them die, what should I do?"

(Karen mother aged 35 having 7 pregnancies and four children who had died)

Mon mothers, even those who had experienced a deceased child, did not address any idea of having extra children to insure or replace the children who may die because they perceived that child death is a rare occurrence. If a mother gives a good care to their children, they will be strong and hardly get sick. Even if a child gets sick, they are confident about the effectiveness of modern medicine that it can cure their child.

"I do not think that I should have many children to ensure the one who may dies. If I give them good care and take them to see a doctor when they get sick, of course, they will not die. If I have more than 4 children, I cannot raise them".

(Mon mother aged 33, who has 4 children, no experience of decreased child)

"My second child died at age 4 months. Now I have three children. It is enough as just this number can help parents to work. I do not think to have another child to replace that one. Their survivorship depends on our merit. If we have a great merit, they will survive."

(Mon mother aged 40, having 3 children, has an experience of one decreased child)

According to the empirical findings related to birth order, it was found that most of the Karen children who died were in birth order of 4-8, whereas only one Mon child died during 5 years preceding the fieldwork. This Mon child was the first birth and cause of death was premature birth.

The number of children reflects not only the fertility but also on mortality; having many children can be considered as one of the risk factors for child mortality because it is related to child birth spacing. Physically, a mother needs time to recover from the last pregnancy and delivery. If they have frequent pregnancies, they will not have sufficient time to recover.

4.7.1.3 Birth spacing

Birth spacing of Karen mothers was shorter than that of Mon mothers due to Karen mothers having a high number of children and uncommon use of contraceptive. More than a half of Karen mothers have a birth interval between 20-28 months, whereas, most Mon mothers have a birth interval around 30-44 months. Several Karen mothers had two children during the same year. They delivered at the beginning of the year and became pregnant again at the end of the same year. Some Karen mothers became pregnant again while their youngest child was just trying or learning to stand. Some Karen mothers had experienced of child death continuously without having any living child in between. After one child died, within few months they became pregnant, thus their birth spacing was very short. Most Karen mothers did not know that if they become pregnant continuously with having short birth spacing, their lack of physical fitness will affect the health of unborn child.

Most Mon mothers did not have any concern about the importance of birth spacing or any concern about physical readiness to have a child. Yet, they extended the duration between pregnancies because they needed time for doing their job. If they would give birth very often, they would have to stop their work for a long period of time to take care of their small babies. This also affected their household income and expenditures. Having another child within a very short period creates a heavy burden for a family because the mother has to stop working and, at the same time, they need

to earn more money to support the new baby. Besides, short birth spacing also affects breastfeeding (This issue is described in detail in the child care section).

4.7.2 The use of health care service

Theoretically, health care utilization is strongly related to health and illness of children. This study also found that the use of contraception, antenatal care and delivery has an influence on child mortality among the Karen and Mon. Details are described below:

4.7.2.1 Use of contraceptive methods

Before the mobile medical unit was introduced in the Karen village, family planning methods were not well known to the Karen. Few of them realized the usefulness of contraception. Also, accessibility of contraceptive methods was awkward; Karens who wanted to control their fertility had to buy the contraceptive pill or take contraceptive injections from drug stores or district hospital at the district that in turn to high cost of contraceptive use as it included travelling cost. Therefore, contraceptive use was not popular among Karen. Birth spacing mainly depends on natural fertility. However, all Karen mothers feed their children with breast milk from birth to one-and-a-half or two years, which results in post partum amenorrhea. This also extends birth spacing among the Karen for several months. Since mobile medical unit and the village healer provided the contraceptive services in the village, Karen women became familiar with contraceptive methods and increasingly the used this service. However, 1in 5 of Karen women still never use contraceptive methods. Karen mothers who reported the use of contraceptive methods were those who ever attended Thai school or ever worked in the urban fringe. This group seems to be a model of contraceptive use. Furthermore, they share their experience and give some suggestion about contraceptive use to their neighbors.

"I was very happy when I become a mother for the first time, but for the 5th and 6th pregnancy, my feeling has changed. I did not want to be pregnant anymore, but I did not know how to stop them……. "

(Karen mother aged 35 years having 7 pregnancies)

The most popular contraceptive methods among Karen women are injections followed by oral pills. However, some of them have a misunderstanding about the use of contraceptive injections. Instead of taking an injection in every three months, they wait until they have a menstruation before taking the next scheduled dose. Some of them waited for 5-6 months that led them become pregnant. The reason for the delayed injection given by the respondents is that Karens traditionally perceive menstruation as bad blood, which should be expelled from their body every month. In relation to the side effects of the hormone contained in contraceptive methods, the users usually suffered from amenorrhea and spot bleeding. Regarding these symptoms, Karens believe that the bad blood is still contained in the body and its effect can make them become weak and easily become sick. Regarding contraceptive pills, all Karen women know that they have to take it continuously, but they do not know why and do not realize that there is a chance of getting pregnant, if they forget to take it. As a result, some of them became pregnant, even though they were not ready to have a child.

"I am using injection but my menstruation stopped. I have to wait until my menstruation occurs. Sometimes, I delay for 6 months before having the next injection. We believe that if our menstruation does not come out monthly, it means that our blood will become dry and it will make women weak and thin."

(Karen mother aged 33 years having 5 children. She does not use any contraceptive methods. During the last several months, she took an injection. Because of amenorrhea, she stopped it.)

In addition, most of Karens are afraid of sterilization. They believe that after having sterilization, they may be unhealthy and cannot do hard work. In detail, Karens perceive the effect of sterilization affecting the body in two directions, upward and downward. Regarding the upward direction, a person who has had sterilization may have headache, dizziness, blurred vision, weakness, fatigue and several illnesses, including obesity. On the other hand, the downward direction may increase their sexual desire. So this kind of belief makes them, even those who have enough children, afraid to have sterilization.

"Actually, I don't want to have more than 3 children, but I am afraid of sterilization. Its side effect might make me unable to work in the rice field. If I could not work, I would not have any money or food to eat. I am not brave enough to do it."

(Karen mother aged 39 years having 6 children, no schooling. using contraceptive injection)

"I am really afraid of it (sterilization). Its effect can go up and down our body. When it goes up, I may have headache and dizziness. When it goes down, my sexual desire might be increase. I may adopt adultery."

(Karen mother aged 36 years having 2 children attended Thai primary school. At the time of the fieldwork, she used contraceptive injection)

Contraceptive use among Mon is comparatively different from that of Karen. In accordance with their migration pattern, Mons habitually move to various places, mainly urban areas. As a result, Mons get a chance to absorb the benefit of contraceptive knowledge and to learn how to use it. Even Mons who moved from Mon refugee camps are also familiar with contraceptive use because family planning service is provided in the camp by NGO medical units. Furthermore, Mons who have just moved from Myanmar also get information about contraceptive use from their Thai employers and their friends in the village. Additionally, the Mon's way of life is quite different from the Karen's. They have to work for wages as they cannot depend on natural resources like the Karen. Mons have to spend a lot on a daily basis for food and monthly fees for water supply and electricity. Hence, Mons are very concerned about the use of contraceptive methods to delay the timing of their first birth or to extend their birth interval until they are economically ready to have the first child or the next child.

"If we get pregnant or take care of little baby all the time, we do not have time to earn money. How is will we live? "

(Mon mother aged 28 years, having 3 children and using the contraceptive pill. Average birth interval is about 38 months)

The most popular contraceptive method among Mon women is oral pills, as it is easy to buy within the village, followed by an injection, which is fairly burdensome as they have to go to a health center, private or district hospital to have it. Most Mons use contraceptive method following the medical instructions. Still, they sometime forgot to take the pill and did not use an additional method to prevent pregnancy. Regarding sterilization, Mons have a similar kind of belief like Karens. They believe that sterilization can make them unhealthy and become prone to get sick easily. However, Mon females had sterilization five times more than Karen.

"Four children are enough for me, but I do not want to have sterilization as I have to work hard. Both Thais and Mons said that after having sterilization, the sterilized person would be unhealthy and could not work hard. I am afraid, so I take contraceptive pills though sometimes I forget to take it."

(Mon mother aged 33, having four children. she actually desired only 3 children)

4.7.2.2 Antenatal care

In general, the daily activity of Karen pregnant women is not different than that of non pregnant women. Most of them carry on their work in their agricultural field until their sixth or seventh months of pregnancy. Some continue their work until delivery. There is no special food for Karen pregnant women. Their meal is similar to other family members. However, Karens have traditional beliefs about food taboos for pregnant women. For example: eating mushrooms during pregnancy may cause a congenital cleft lip; eating snapping turtle may cause a child's congenital anomaly of having merely soft upper limb which looks like the legs of a snapping turtle; eating barking deer may cause abortion; eating egg plant may make their amniotic membrane become thicker than usual, which may lead to difficult delivery.

Besides, there are other traditional practices proscriptions for pregnant women. For instance, if bathing after sunset, the cold water may affect the unborn baby to be unhealthy, sitting on a stair may cause obstructed delivery, attending funeral ceremony

or going outside a house during the night time may make the baby frightened and lead to premature labor.

Compared to Christian Karens, Buddhist Karens mainly follow these beliefs and practices. The Christian Karens are taught not to believe in superstitions. However these beliefs and practice still remain in this village. Women who attend antenatal care in a hospital also follow these beliefs. This study could not determine any effect of traditional beliefs on the health status of the baby because there was not enough information, particularly regarding birth weight. Besides, there were several factors related to limitations of food sources in the Karen village.

Regarding sexual practices during pregnancy, most Karens stop having sex around the seventh month of pregnancy; they follow the suggestions of parents and elderly people, but they do not know the reason. Among the Karen sample, there were five mothers who always smoked, even during pregnancy. These mothers did not know the adverse effect of smoking on their unborn baby. Regarding complications during pregnancy such as morning sickness, leg swelling, discomfort, or low back pain, most of them considered these kinds of symptoms as normal symptoms for pregnant women, so they did not do anything about it. They think that these symptoms will go away without treatment. However, for some minor symptoms such as discomfort or low back pain, Karens usually call a TBA to do a massage to relieve these uncomfortable symptoms. In the case of severe morning sickness or low appetite that affected their health until they became weak, they managed these symptoms either by buying drugs from grocery shop or by asking the village doctor to provide nutritious injections or intra venous fluids at their home. In this village, the TBA has no role to take care of or to provide some suggestions to pregnant women during their pregnancy period. They merely attend to the pregnant woman when she is about to give birth.

During pregnancy, Mon mothers also do not stop working, they work up to their sixth to eighth month of pregnancy. Yet, many of them continue their work until delivery as they need to earn money for their living. Mainly, they work in a broom

factory. Although this kind of job does not seem to be hard work, it is not suitable for nearly term pregnant women as they have to sit on the floor for 8 hours per day.

Regarding food consumption during pregnancy, Mon mothers eat some nutritious foods, such as eggs, milk, and meat following the suggestions of health providers that they get during antenatal care visits. Generally, Mon women have two meals daily. During pregnancy, some of them add one extra meal. They usually stop having sexual relationships with their husbands around their seventh month of pregnancy according to the suggestion of medical providers and elders.

However Mons also follow traditional beliefs about food and practice taboos for pregnant women. Mainly, these are quite similar to Karen's beliefs, but different in details. For example, taking a bath in the evening may cause long labor pain- it may take whole day and whole night; and leaving unclean utensils overnight after having a meal may cause a difficult delivery.

"Since my seventh month, I did not have sex with my husband. The elder told me that if we violate the restriction, my vagina will close and the baby cannot come out. Also, bathing should not be done at night because our sarong will get wet, and then the cold may affect our baby."

(Mon mother aged 31 years, having 2 children and following food and practice taboos during her pregnancies)

Conversely, Mons have much more concern about complications during pregnancy than Karens. They often go to visit a doctor for mild symptoms, even though they perceived those symptoms as common complications for pregnant women.

"I suffered from dizziness and vomiting for 4 months. I think that morning sickness was not a normal symptom as some women suffered but some did not. So I went to see a doctor. If I did not take some medicine, the symptoms would not be relieved."

(Mon mother aged 18 years, having 1 child, attending Thai primary school)

The use of Antenatal services

Attending antenatal care from a health station for at least 4 visits is an indicator to ensure that both mother and baby are well monitored on nutritional status, immunization, complications, and other problems that might occur during pregnancy. These services help ensure a safe delivery and healthy baby. Thus, antenatal care is well recognized as a crucial factor for child survival. According to the data collected from antenatal care history, it was found that 70% of the Karen mothers reported that they did not attend antenatal care, and 15% visited antenatal care less than 4 times. Only 15% of mothers attended antenatal care more than 4 times.

It is also notable that all the Karen mothers of 10 deceased children did not attend antenatal care at all. Within this group, if the mothers of 2 deceased children had attended antenatal care, their children might have survived. The first one was a twin pregnancy, but the mother did not know. The child was delivered before full term and finally died. In the second case, the mother was 15 years old and only 145 centimeter high. Her condition was at high risk of complications during pregnancy and delivery.

Most Karens who did not receive antenatal care perceived that pregnancy is a somewhat a natural process. Women can naturally proceed through this process to delivery without any health interventions. They believe that they did not need to go to the hospital unless they got sick. This group also has a low income and rarely goes outside the village. Whereas, the majority of Karen mothers who received antenatal care were those who were better off having a monthly income of more than 3,000 baht, or attended Thai school, including mothers who have experience working in the urban fringe. However, they had never attended school, neither in Thailand nor in Myanmar, but they learned the benefit of antenatal care from their work place; colleagues and employers. The jobs that Karen women usually perform are baby sitters, elderly care takers, maids in factories, and laborers in orchid farms. Some of them moved to work in an urban area with their husbands and got pregnant over there. Their Thai friends and Thai employers suggested and encouraged them to receive antenatal care. When they visited a health station for antenatal care, they understood

the usefulness of it. Furthermore, Karen husbands who ever worked in urban area recognized the benefit of antenatal care, and also supported their wives to utilize this service. Unfortunately, transportation from the village to the hospital is inconvenient and costly. When attending antenatal care following the medical regulations, Karen mothers have to visit the hospital several times until they reach full term, which is high cost expenditure. These difficulties impede the Karens to access antenatal care service. Some could afford visiting only 1-2 times, even though they understood its benefit. Also, nearly a half of Karens who had an insurance card did not receive antenatal care. Even if the service was free of charge, they could not afford the travelling cost and other expenditures.

"When I was working in the factory, all Thai workers went to the hospital when they got pregnant. They told me about how useful it is. So, I also received antenatal check-ups when I was pregnant."

(Karen mother aged 26 years, having 1 child, ever work as housemaid and laborer in a factory in Bangkok periphery for 5 years)

In the past two years, Karen women have more access to antenatal care, since a mobile clinic has been initiated to provide antenatal care in the village. Antenatal care service provided for the villagers is incomplete basic service. It provides gestational check-up and vitamins to nourish the mother and unborn baby, while the pregnant women are encouraged to have tetanus toxiod, laboratory blood tests, and urine test at the hospital. Together, those who are suggested to have a check-up within less than 2 months (nearly full term pregnancy) are given an appointment to follow their check-up at the hospital.

"I did not know the benefit of using antenatal care before. Then I got the suggestion from the mobile medical unit. I realized the benefit of having antenatal care. So I sought antenatal check-up during my 3rd and 4th pregnancy."

(Karen mother aged 34 years, having 4 children)

Mons used antenatal care services significantly more than Karens. When they got pregnant, 55% of Mon mothers had at least four antenatal visits with an appropriate health-care provider, and received the recommended doses of the tetanus toxiod vaccinations. Fifteen percent had antenatal visits only 1-2 times. They discontinued antenatal visits because of the difficulty of travelling and cost of services. The remaining Mon mothers, about 30%, did not attend antenatal care. Within this number, 1 in 3 had an experience of a deceased child more than last 5 years preceding the fieldwork. As stated before, because Mons interact with Thai people all the time when either living or working together, therefore, they have a chance to receive health information and to absorb cultural health behavior of the mainstream. This resulted in high adoption of modern health services among Mons. According to empirical data from the fieldwork, it can be implied that education and economic conditions do not play an important role for using antenatal services among Mons. The study found that whether they attended school or not and whether they have more or less income, most Mon mothers receive antenatal services. Even among some low income cases, they also attain this service.

"Before moving here, I lived at Jadee (the name of a Thai village). Over there, the majority of villagers were Thais. Whenever they saw pregnant Mons, they usually asked us, "Did you have antenatal care yet?" I ever worked with a Thai employer. When I got pregnant, she also encouraged me to get the check-up."

(Mon mother aged 30 years, having 1 child, ever worked at Ratchaburi and Nakhon Pathom for 3 years, received antenatal care more than 4 visits)

"I received antenatal care because people told me that it is good. All Thai women commonly use this service. When visiting the antenatal clinic, the obstetrician examined our uterus and x-rayed our babies in order to evaluate their health. We had to go to the health station regularly to receive the services. Sometimes, I had no money. I borrowed from neighbors. I was afraid of obstructed labor. However, if we have any problems, the doctor can help us."

(Mon mother aged 20 years, having 2 children, attended antenatal care regularly for both pregnancies)

Although health stations are not located in both of the studied villages, Mons are more likely access to antenatal care than Karens. The Mon village is surrounded by various and easily accessible heath service stations. Mon pregnant women can seek antenatal service from health centers, private hospital, and district hospital. However, there are some barriers that impede a few Mons to accessing antenatal services, particularly, the Mons who currently move to stay in the village. They do not know how to get access and some have the misunderstanding that illegal migrants are not allowed to seek health services from government hospitals. Furthermore, even income is not a crucial problem impeding antenatal care among Mons, however, it still affects those who have very low income.

4.7.2.3 Delivery care

Delivery is a vital period for child survival chance, despite the fact that it is a short period and seems to be a natural process. Still, there are many concerns to address, including cleanliness to prevent infectious during delivery, and good attending. Childbirth attended by professional providers or trained TBAs is considered as an indicator to ensure survivorship of mother and baby. Regarding the childbirth history of children under 5 years of age and deceased children who died during the last 5 years preceding the fieldwork, apart from the low percentage of receiving antenatal care, 83% of Karen mothers delivered their babies at home and were attended by untrained TBAs. Only 3 childbirths were attended by trained TBAs.

According to in-depth interviews on patterns of childbirth attended by TBAs gathered from 40 Karen mothers who were attended during childbirth by 4 TBAs, the process of attending childbirth begins at once when the onset of labor pain starts, then the husbands or relatives of pregnant woman go to call for a TBA. Giving birth at home among Karen women has no preparation and no appointment is made with the TBA before having labor pain. Most Karen pregnant women do not know their exact gestational age because after their previous child birth, most of them experience lactational amenorrhea. Thus, they come to know that they got pregnant because they could notice the enlargement of their abdomens. Among all TBAs, the Karens do not pay a special trust to any particular TBAs, even trained TBAs. They recognize that all TBAs have equal capability to attend childbirth. The husband or relative prepares

warm water for cleansing the newborn, cotton thread for clamping the umbilical cord, and a sliver of bamboo for cutting the umbilical cord. Recently, some Karens tend to buy razor blades from grocery store for cutting the cord as it more convenient to obtain than a bamboo knife. In emergency cases, those who obtained neither a bamboo knife nor razor blade used a kitchen knife or hunting knife to cut the cord. All instruments that TBAs used to cut the cord were not boiled or clean.

According to in-depth interview from TBAs on their experience about abnormal delivery, they reported that very few abnormal cases were found. Regarding their experiences, they ever attended twin pregnancy, breech presentation, and prolonged labor. Regarding the outcomes of abnormal labors attended by TBAs, some babies survived and some babies died. Particularly for twin babies, one of them usually died. In cases of prolonged labor, if the process of delivery took a whole day and night and the delivery was not success, the TBA suggested that the pregnant women give birth at a hospital. In relation to their delay, in some cases it was too late to save the life of the baby.

As most Karen pregnant mothers did not receive antenatal care at health stations, they did not receive the recommended doses of the tetanus toxiod vaccination. Moreover, they were attended during birth by TBAs who used non-sterile instruments to cut the cord. This may cause the high risk of neonatal tetanus. Among the 11 children that died, two of them (one aged 1 hour, and another aged 8 days) had fever, spasm, and a stiff neck. The mothers of these two newborns did not receive antenatal care and their childbirth was attended by TBAs using a contaminated sliver of bamboo and a knife to cut an umbilical cord. However, the evidence is not sufficient to draw the conclusion that the newborns had died from tetanus.

“I selected Norta (TBA’s name). She helped me in all my pregnancies. Because she lives near my house, it is more convenient. I did not visit a hospital because of no money.”

(Karen mother aged 36 years having 4 children. All pregnancies took place at home attended by untrained TBAs)

The Karen pregnant mothers who choose to give birth at hospitals mainly realized the necessity of the delivery at hospitals and attended antenatal care there before. However, some mothers gave birth at the hospital for other purposes; they intended to have sterilization or to get birth certificates for their babies rather than concern for safety during delivery. Those who needed birth certificates hoped that they could use this document to do birth registration at the district office. As their babies are registered, they hope that their babies would be granted Thai nationality in the future.

"I delivered at a hospital because some people told me that it was easy to do birth registration for my baby. If I delivered at home, I would not have any documents. At the hospital, the doctor gave me a birth certificate. I could bring this document to register my baby's birth at the district office. If I did not deliver at the hospital, I would face problems during the birth registration process. The head of our village or his assistant would have to go to the district office with me in order to confirm that me and my baby are living in their village."

(Karen mother aged 26 years having 1 child. She finished grade 3 at Thai school in the village. In her first pregnancy, she attended antenatal care regularly.)

Some mothers intended to deliver at hospitals, but because of the long distance between their houses and the hospital, they could not reach it on time. The travelling also impeded accessibility to get delivery services at the hospital among Karen mothers who have an insurance card as they could not afford the traveling cost. Based on the evidence from the fieldwork, the delivery at hospitals can reduce the risk of newborn deaths. For example, regarding 2 Karen mothers who did not attend antenatal care; one had hypertension and the others, her baby was in a breech presentation, but they could safely deliver their babies with timely help from the obstetricians. Apparently, if they were delivered at home, both mothers and babies might have a high risk of death.

More than half (53%) of childbirths among Mons were attended by TBAs and the rest (47%) were attended by professional health providers at hospitals. The Mons

who delivered at the hospital mainly were those who had complete antenatal visits[15]. This group of people emphasized the safety of their babies from the time they got pregnant till delivery. Whereas, those whose childbirths were attended by TBAs were among the group of women who had incomplete antenatal visits, or did not have any antenatal care at all. Delivery at home among these mothers mostly occurred in their previous villages before they moved to this studied village. Only few cases delivered at home and were attended by TBAs in the village.

"I don't want to deliver attended by a TBA because I have never use their services. All my babies were delivered at the hospital, which was good and comfortable. We can get effective medicines. So, after giving birth, we can eat anything we like."

(Mon mother aged 21 years having 1 child, received complete antenatal care and gave birth at the district hospital)

"Nowadays, nobody delivers at home, except in the case of emergency. We do not live in a jungle, we live in the city."

(Mon mother aged 19 years, no schooling, having 1 child, received complete antenatal care and gave birth at the district hospital)

Among the 3 TBAs in the Mon village, one Mon TBA is very old and retired a long time ago. Another Mon TBA lives at the Conservation Center for Water Source which is quite far away from the Mon compound, so she mostly attended delivery for a few Mons around that area. The one Karen TBA is frequently asked to attend childbirth since she lives in the Mon compound. The delivery methods used by the TBAs in Mon village are similar to those in Karen villages. The TBAs in the Mon village also use a razor blade bought from a grocery store for cutting the umbilical cord. In general, the razor blades are not cleaned or boiled before use. The cause of death of one Mon deceased infant was not related to an unclean or unsafe delivery process since the mother had complete antenatal care and delivered at a hospital. The mother responded that the doctor told her that her baby died due to premature labor.

[15] Attending antenatal visits more than 4 times and strictly follows the check up according to on medical recommendation.

4.7.3 Child care

It is well established that post neonatal death is strongly related to child care. Child care in this study is primarily focused on three key concerning practices; food care, vaccination, and well baby clinic attendance, which are important factors for child health and illness prevention.

4.7.3.1 Food care

The patterns of food care for Karen children provided by Karen mothers appeared in various forms, including traditional practices and integrated Thai practices or nutritional standards. Traditionally, all Karen mothers realize the importance of breast milk and breastfeed their children for 2 to 3 years. This kind of practice serves to strengthen survivorship among Karen children as breast milk is clean, and provides antibacterial and antiviral agents, which protect the infant against disease. It also aids the development of the immune system. For this reason, after giving birth, all Karen mothers usually eat some foods to nourish the breast milk. Food prescription for increasing the production and flow of breast milk is *'banana blossom soup'* cooked with peppers, garlic, and sometimes some chicken meat or dried fishes can be put in. Typically, they have this kind of food for at least 3 months.

Karens have traditional beliefs about the connection between breast milk and child's illness. They believe that if mother eats some prohibited foods; its toxin can pass through her breast milk to affect the child's health. For example, if the mother consumes green squash or cucumber, it can possibly cause the child to get sick as these vegetables are perceived as cool food so they may reduce the body temperature of the baby. Another prohibited vegetable is fresh chilies that are believed to cause stomachache, so the baby often cries all night. Moreover, if the baby gets sick during breastfeeding, the mother usually stops eating all kinds of food. They are allowed to eat only rice with shrimp paste until the baby recovers. They believe that if they violate the food taboo, toxins contained in their breast milk may exacerbate the baby's sickness or induce more complications.

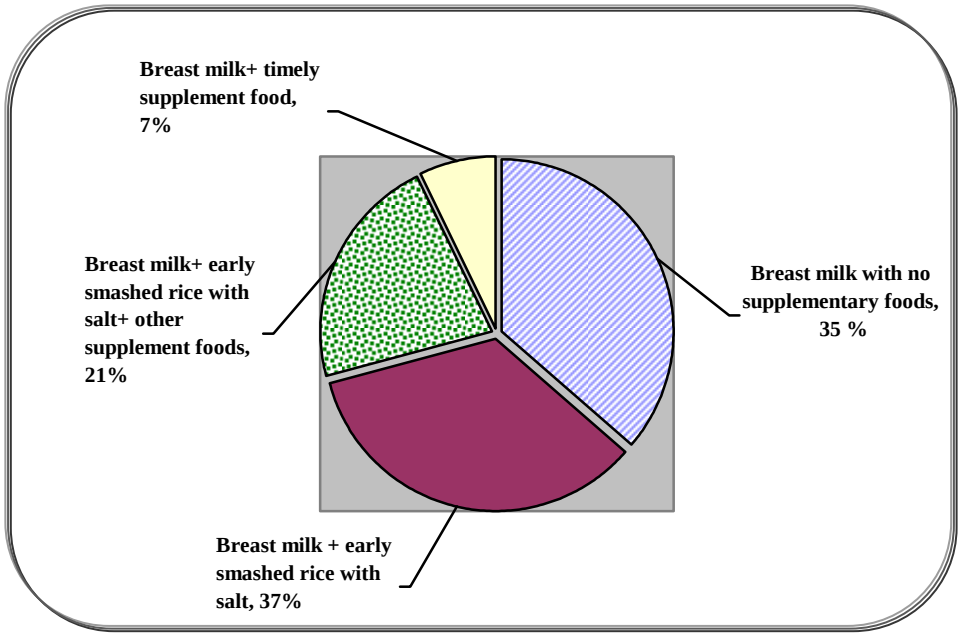


Figure 4.1 Pattern of food care for Karen infants reported by 62 Karen mothers

Conventionally, all Karen mothers feed their babies with breast milk, but patterns of food care are varied in supplementary food according to the children' age. The food care adopted by Karen mothers are possibly categorized into 4 patterns (See figure 4.1). In the first pattern, Karen mothers give their children only breast milk without other supplementary foods from childbirth up to one and a half years (18%), and some continue to breastfeed up to two years (17%). In the second pattern, adopted by 36% of Karen mothers, which has passed through generations to generations, Karen mothers do not give only breast milk to their children, as they give smashed rice seasoned with salt to their baby from age 1 month, or 2-3 months. At the beginning, they feed smashed rice once a day. When their children reach 5-6 months, mothers increase the meals up to twice a day and continue this feeding until the children are aged one and a half years, and then let the children eat adult foods. The mothers who do not feed supplementary foods to their babies, or just give only smashed rice with salt, have the view on child food that merely breast milk and smashed rice are appropriate food for the baby, while other kind of foods, such as vegetables, meat, or fruits, are difficult for the baby to digest. Also, the baby's body may not be ready for these kinds of food and this may cause stomachache or other illnesses. Karen mothers believe that whenever the babies are able to pick up such kinds of food to eat by

themselves, it indicates that baby's body is ready for that food. It was observed that most babies raised by those patterns earlier mentioned are slim and underweight. They often have tantrums and ask for breast milk most of the time.

Another pattern of child care, which is practiced by 21% of Karen women, is fairly similar to the second pattern, yet the supplementary food is not only smashed rice with salt, but also other nutritional foods. The mothers feed the babies early with smashed rice until the babies are 6-7 months of age, and later feed them wet rice mixed with vegetables, fish, or eggs (if they can afford it) twice a day. Only 7% of Karen women practice the last pattern, which follows the nutritional medicine. Regarding this pattern, the mothers breastfeed their babies from birth up to 6 months old, and then give a supplementary diet consisting of smashed steamed rice mixed with eggs, meat, fish, or vegetables, starting from once a day and then twice a day when the babies reach 7-8 months old. Karen mothers who practice the last pattern reported that they obtained the knowledge on supplementary feeding from health providers and through health booklets published in the Burmese Language when they received antenatal visits. Some mothers learned appropriate feeding behavior from their own experience when they worked as a baby sitter for Thai families in urban areas.

Lack of contraceptive use also affected breastfeeding. About 1 out of 4 of Karen mothers, who breastfed their babies for only 6-7 months, became pregnant with another baby, which in turn caused them to stop breastfeeding their current baby. Some of them solved the problem by feeding their babies sweetened condensed milk. Some shifted from breast milk to smashed rice and sterilized cow's milk which was distributed to children who attended the child care center. Pre-primary children took the milk home to feed their younger siblings rather than drinking it themselves. Some mothers continued breastfeeding for about 1–2 months even though they were pregnant.

"I have breastfed all my babies. However, I didn't have much milk to feed them. I had fed my baby that later died just for only 2 months, and then I fed him with sweetened condensed milk. It was too expensive for me, thus I fed him both my breast milk and condensed milk. As he was so young, I did not give other foods for him."

(Karen mother aged 28, having 4 children and an experience of a child that died at 9 months of age from measles and diarrhea in 2004)

The diet for weaning children is steamed rice and other adult foods. Karens do not cook special meals for young children. Generally, children have 3 meals a day and the common dishes are soup, boiled vegetables, chili paste, and fish. Children often do not have meat for a long time. Meat and eggs are rarely cooked for food as these items are expensive. Furthermore, obtaining some kind of meats depended on seasonal hunting. As such, wild hogs can be hunted during the ripening rice season. Mountain frogs can be found during the rainy season. Sometimes, if they have some money, they could afford to buy some meats, such as when the neighbors hunt or kill their raised pigs for sale. Even though 66% of households raise chickens for domestic consumption, the number is too few to supply their meals. Some plant vegetables are available around their homes and agricultural fields, such as roselle, pumpkin, sour cucumber, and banana. However, the quantities are not enough for regular supply. On occasion, parents could not find any additional food stuff, so their children usually relied on steamed rice and salt or shrimp paste or even steamed rice only.

"I breastfed my baby until she began walking. When she could grasp the food to eat with her own hand, I let her eat any food that we (parents) eat…like roselle soup, chili paste, and vegetables. Infrequently, we have some meat to eat like wild hog, civet cat, or frogs, if my husband could hunt them. Sometimes, for nearly a month, we did not eat meat."

(Karen mother aged 33 years having 4 children; the youngest is 2 years of age)

Most patterns of food care among Karens do not follow nutritional standards. Most Karen children do not get proper supplementary foods according to their age. In addition, they receive insufficient amounts of protein and vitamins. Basically, Karen mothers practice the traditional patterns of child care learned from their parents. Over

all, the food sources in this Karen village are limited and their economic status does not allow them to seek other food sources outside the village. Based on the nutritional measurements during the fieldwork, it was found that almost half of the Karen children under 5 years old have malnutrition problems. That is, 33% are mildly underweight, and 12% are moderately underweight according to their height, age and sex.[16] The majority of children with malnutrition are found in low income families in which children do not have sufficient varieties of nutritious food.

However, the child care center in the village plays an important role in nutritional improvement of pre-primary children. Usually, after weaning Karen children tend to receive improper and inadequate food intake that lead to nutritional problems among this age group. This may affect both the physical and mental development of the children. This center helps to reduce and to prevent nutritional problems among Karen children as it takes care of 3-5 year-old children, which are considered to be the at risk group for malnutrition. In the past two years, the local administrative organization has been responsible for the center. As a result, more funding has been allocated for administration, especially the nutritional lunch provision fund, including a supplement diet. Therefore, the children who enter the program of readiness preparation would have access to a more nutritious diet. However, some eligible children (20%) do not enroll in the child care center because their parents do not realize the importance of the pre-school program.

Similarly to the Karens, Mon mothers also realize the necessity of breastfeeding their babies. Although, earning wages is essential for Mon mothers, after childbirth, they stop working to take care of their babies and feed them for at least one-and-a-half years or up to 2 years in some cases. They believe that breastfeeding is the most appropriate, convenient and economical method. The Mons also adhere to cultural beliefs about foods proscription to nourish breast milk as the Karens. Also, they have beliefs about food taboos during the lactation period. However, the Mon mothers do not practice the cessation of ingesting some food when their babies are ill.

---

[16] Nutritional measurement is based on health booklet proposed by the Ministry of Public Health.

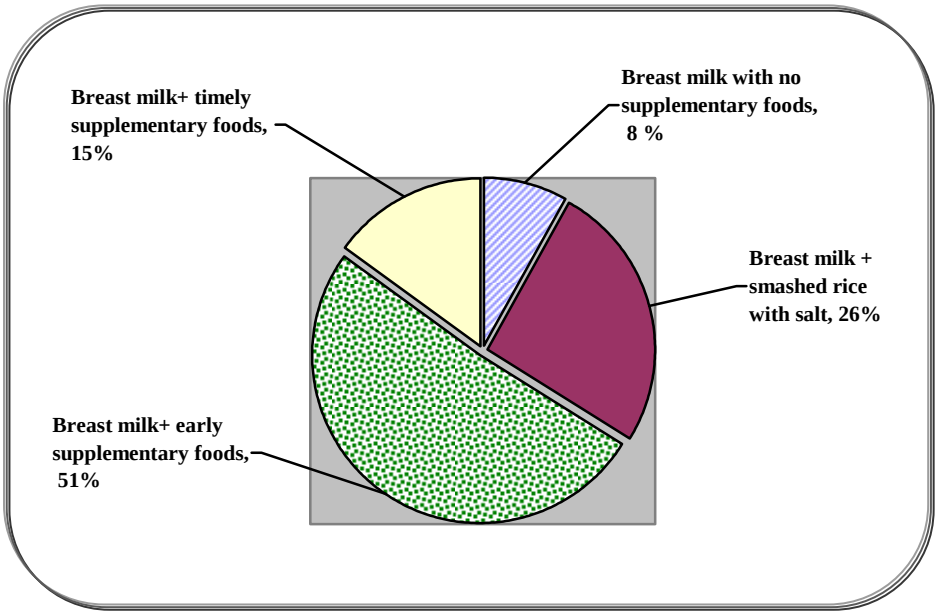


Figure 4.2 Pattern of food care for Mon infants reported by 29 Mon mothers

Various patterns of diets are adopted by the Mon mothers. Typically, most Mon mothers do not rely merely on breastfeeding. More than 50% of Mon mothers simultaneously give their babies supplementary food along with breast milk. This knowledge was gained when they attend antenatal service and the well baby clinic. Also, they acquired this knowledge from Thai people with whom they were acquainted. This group of Mon mothers realizes that just giving only breast milk is not enough for physical needs when the baby grows up. However, it was found that an early introduction of solid or semi-solid supplementary food is common among Mon mothers. They start to feed babies with steamed rice mashed with egg yolk, or ripened bananas (37%), and smashed rice with salt (14%) when they are aged 1-3 months. When the babies reach 6-7 months old, they are given wet rice mixed with soup, fish, vegetables, eggs, or meat. Some mothers, however, do not give meat to their babies because they believe it may cause parasites. Only 15% of mothers give a timely supplementary food after the baby is breastfed up to 6 months old and then it is given supplementary food in addition to breast milk. Another group (26%) does not give sufficient and appropriate supplementary foods to their babies; like the Karen, they add only smashed rice with salt when the baby is aged 3 months and continue this

feeding up to one-and-a-half years old. The rest of Mon mothers (8%) solely breastfeed until their babies up to 1-2 years. These mothers recently emigrated to live in Thailand for a few years (1-3 years). They have never worked in an urban area and cannot read or write neither Thai nor Burmese languages.

"The doctor from the hospital suggested to me that when a baby is growing, only breast milk is not enough for him, so I should add some supplementary foods."

(Mon mother aged 33 years, attending antenatal care for all her four pregnancies)

After weaning, the Mon mothers give food to their children 3 times a day including mild soup, vegetables, eggs, and meat, as well as seasonal fruits. They cook separate dishes for the children, which are mainly non-spicy foods. The Mon children have more various nutritious intakes than Karen children because there are more available food sources in the Mon village than the Karen village. Moreover, the Mon mothers can afford fresh foods daily sold by either grocery stores or mobile food venders. According to observation, Mon children did not eat rice with salt or shrimp paste, which could be seen in Karen children. Even in low income Mon families, they can buy foods with installment as the shopkeepers know that they have the ability to pay when they get their monthly wages. Besides, few of the Mons plant some vegetables and raise some chickens for consumption, but they do not have much time to take care of them as they have to work all day.

Even though the Mon children are raised more nutritiously than the Karen children, the child care center in the Mon village is also effective in child nutritional surveillance and development. Regarding the Nutrition Assessment Inventory employed by the child care center in collaboration with the health center, it was found that only 10% of Mon children, mainly those 2-3 years old whose mothers recently emigrated, have a nutritional status below the standard. When the under nourished children are indentified, the health center officer suggests to the care taker in the child care center to increase the amount of supplementary milk from the usual 1 carton to 2-3 cartons per day together with some essential vitamins, and the nutritional follow-up among underweight children is performed continuously.

The nutritional status of the Karen children is significantly lower than that of the Mon children. In fact, Karen villagers totally rely on food sources in their village and they cannot afford food from the outside. Moreover, Karen mothers rarely attend antenatal care or contact with outsiders. As a result, they have less chance to learn about child care and how to promote the nutritional status of the children. Additionally, the office responsible for child nutrition in the Karen village does not fully operate. Due to the limitations as stated before together with their traditional beliefs, some Karen children had nutritional problem that may have contributed to sickness and death. With regard to the fieldwork survey on children who had died last 5 years, two of them had a nutritional factor leading to their death. The former was given sweetened condensed milk from the time his age was two months because the mother did not have enough breast milk. Also, the mother never gave any supplementary foods to him. The child suffered from chronic diarrhea and then died when he was 9 months old. It is a fact that feeding babies with sweetened condensed milk with no appropriate supplementary food may lead to nutritional deficiency, malnutrition, weakness, and low immunity. Moreover, unhygienic milk preparation leads malnourished children to have a greater chance to get diarrhea or gastroenteritis and the conditions tend to be more severe than among healthy children.

The latter child died when she was aged 15 months after suffering from measles and diarrhea for 2 weeks. This child was breastfed and her supplementary food was started when she was aged 1 month with smashed rice and salt, and changed to wet rice with soup consisting mainly of vegetables like squash, roselle, sour cucumber, and, once or twice a month, with eggs and meat when she reached 8 months until her death. Her mother informed us that the child, compared with other children in the same age, seemed smaller and thinner than her neighbors (the child's weight was never measured). The child got sick with measles for 1 week. After the rashes flared all over her body, she still had fever. Then, she suffered from diarrhea and ulcers around the inner lips. She could not eat anything and eventually died during the second week of sickness. Generally, when malnourish children suffer with measles, they are likely to get severe complications such as diarrhea, pneumonia, or encephalitis, which contribute to death.

4.7.3.2 Vaccination

Before the medical mobile unit provided vaccination service in the village, most Karen villagers did not know about immunization for their children. Most children under 5 years old were not vaccinated. For the last 4 years, the medical mobile unit has come to promote immunization coverage in the Karen village through village loudspeakers and health volunteers. Most Karens brought their children for vaccination, however, they know only that vaccines can prevent many pediatric diseases but do not know what specific preventable diseases, and how often and at what age vaccination should be done. The mobile health providers really perceive that most children never have vaccination. Immunizing late is better than not immunizing at all; therefore they provide a full course of immunization, including tuberculosis, diphtheria, tetanus, pertussis, measles and oral polio vaccine for all children, even those over the age for the recommended immunization schedule. Each vaccinated child was given a booklet that recorded the kind of vaccine, date of vaccination, and the date for the next appointment. However, most mothers often lose or destroy the booklet, or forget to bring it with them when receiving the service. The health providers solve this problem by starting all vaccines once again to ensure children receive a full course of immunizations. In medical practice, children should obtain recommended vaccines within the first year of age to prevent important contagious diseases (Hill, Kirkwood and Edmond, 2004). Immunizing a child later than scheduled puts infants at risk of unprotected exposure to early-life pathogens and decreases the efficacy of the vaccine.

The data indicate that 40% of the Karen children under five years receive all kind of vaccines but not follow a timely schedule. Most of them receive vaccination when they are over 1 year old. Another 40% of children do not receive all the recommended vaccines and do not follow a timely schedule. Even though the medical mobile unit provides an outreach service in the village, some mothers do not bring their children for immunization because they do not realize the benefit of it. Some prefer to work in the agricultural field rather than take their children to get vaccinated. Five percent of those who never receive vaccines are newborn babies or a-few-month old infants. All of them were born in their homes. Their mothers have been waiting for

immunization service during the next arrival of the medical mobile unit. However, they do not know what kind of vaccine and when their children should have it. Only 15% of children whose mothers have Thai nationality and are educated in Thailand receive all the recommended vaccines and follow a timely schedule. These mothers are aware of the necessity of vaccination. They received antenatal care and gave birth at a hospital. Therefore, their children receive vaccinations since birth. Moreover, they take their children to have vaccination according to medical advice.

Apparently, vaccination of the Mon children is significantly different from that of the Karen children. Most Mon mothers attend antenatal care and give birth at a hospital, so they obtain suggestions and guidelines about immunization for a newborn. Thus, most of them realize the importance of vaccination despite the fact that the medical mobile unit does not provide health services in the village. Approximately 53% of under-five year-old Mon children received timely recommended vaccines from the health center and the private hospital that provides a campaign to promote the immunization coverage by charging only 20 baht per time. When a child who receives vaccination following medical recommendation gets sick, the hospital will charge only a half of total cost of treatment. Few children get immunization at the district hospital as its location quite far from the village. Ten percent of the children receive all vaccines but not follow a timely schedule. Twenty-four percent do not receive all recommended vaccines due to financial difficulty and travel inconvenience. Thirteen percent of Mon children whose mothers are newly and undocumented migrants do not receive vaccination. They realized that they are illegal migrants, thus they are afraid to seek health services for their children. Some of them did not attend or visit antenatal care regularly, and gave birth at their homes. They worry that health providers may blame them about not following professional advices, therefore they are scared to get the services at the health stations.

4.7.3.3 Well baby clinic attendance

A well baby clinic is a medical unit to take care of physical development, nutritional surveillance, and disease prevention among children. At the clinic they will be vaccinated and examined on growth, vision, hearing, speaking, and movement as a

means to promote their health and well-being. Attending the clinic is especially necessary for children since health problems or disorders can be solved before entering a school, particularly for under 1 year-old children who are at risk of death if they are improperly brought up. Apart from the clinic, a child care center is another organization to take part in taking care of pre-school children's nutritional surveillance and physical development by collaborating with the health center. The child care center regularly reports surveillance activities and its outcome to the health center staff. Then, the health staff will give the suggestion to cake takers in the child care center if the children have nutritional problems.

Most Karens usually evaluate their children's healthiness and strength by comparing their sizes with other children in the same age and considering their illnesses. If their children are tubby or do not frequently get sick, they consider that the children are healthy. Even for those children who are thin, but hardly get sick, Mons also perceive that they have good health. Most Karens do not know that they have to take their children to be examined at the well baby clinic for physical and mental development as well as nutritional status evaluation. Due to the lack of an array of diagnostic and preventative services, the Karens did not know what their children's problems were, so health problems among Karen children were not solved. As stated earlier, almost half of the under-5-year-old children had a nutritional status below the standard. In addition, there were 3 children suffering from underdevelopment. This might be because their mothers were infected with malaria during pregnancy which could affect the child's development. Few Karen mothers who previously had antenatal care or worked in urban areas realized the benefits of attending the well baby clinics and took their children to have vaccination and to measure their weight and height at the hospital. Thus, only 14% of Karen children attended the well baby clinics. Contrary to Karens, the study found that 59% of Mon children received the services from the well baby clinics at the hospitals or at the health center. This results from the fact that most of the Mon mothers had antenatal visits at the hospitals, so they were informed about how to take care of their children. Also, they got knowledge from a health booklet distributed during attended antenatal visits. This handbook provides information on the guideline of child care, food care, physical development, and

nutritional surveillance, as well as required immunization. Mon mothers were reminded by this health handbook and took their children to the clinic routinely.

4.7.4 Beliefs about causes of illness

Beliefs or perceptions on causes of illness are considered as a crucial factor influencing disease prevention and care seeking behavior. According to the data on beliefs and perceptions about causes of death among deceased children during the 5 years preceding the fieldwork (11 deceased Karen children and 1 deceased Mon child), it was found that labeling the illness, both within the local classification system and by severity, are strongly related to non-treatment, inappropriate care-seeking, and delayed treatment, which results in childhood mortality.

Karen people in the village do not conceive that ailments are caused by supernatural powers, devils, or germs. Explanations of causes of illness among Karens are accumulated from their experiences transmitted from generation to generation. Accordingly, their perceptions on causes of illness are uncomplicated. They just notice the symptoms that children frequently suffered. These various symptoms are simply categorized into different groups of illness according to their perceptions. Regarding the data on cause of death among 11 Karen children, the respondents reported that only 5 illnesses caused the death of their child; *Tacha Phutha* (*Tacha* in Karen language means disease or ailment, *Phutha* means a child. *Thacha Phutha* is children's ailments); *Kamoh Kapah* (the ailment is cause by some organs in the abdominal cavity moving down from their normal position, so a palpable abdominal mass can be noted. *Kamoh* means palpable mass below the right costal border, and *Kapah* means palpable mass below the left costal border); *Tha Mhok* (measles); and *Tacha Her Ler Muu Pher Pher Pue* (disease that a mother transmits to her child during the pregnancy period or the disease is developed in the uterus).

Table 4.5 The data on causes of death among 12 deceased Karen and Mon children, 2002-2006

No	Age of deceased child	Cause of death* (according to respondent)	Cause of death (according to verbal autopsy**)	Symptoms (Duration of sickness)	Therapy
1	4 months	Kamoh Kapah	Malaria	Fever, not cough, sphenomegaly, vomiting, jaundice (4 days)	Sacred healer
2	8 days	Tacha Phutha	Premature baby (twin)	Delivered at 8th month, weight was around 900-1000 gm, difficult breathing, could not suck breast milk. (8 days)	No treatment
3	1 hour	Tacha Phutha	Birth asphyxia	Difficult breathing (Mother aged 15 years, height 145 cm, and first pregnancy. An umbilical cord was cut 1 hour after birth	No treatment
4	42 months	Tacha Boh	Cerebral malaria	Fever, chills, vomiting, depression and convulsion. (6 days)	Buy drugs from grocery store, malaria screening unit, district hospital
5	2 months	Tacha Phutha	Meningitis	Stiff neck, generalized convulsion, unconscious. (2 days)	No treatment
6	6 months	Kamoh Kapah and Thacha Phutha	Pneumonia	Fever, no jaundice, tender abdomen, difficult and rapid breathing. (1 week)	Buy drug to relieve fever from grocery store, sacred healer, district hospital, and provincial hospital.
7	15 months	Tha Mhok	Measles and diarrhea	Fever with rash for 8 days and diarrhea for 7 days (15 days)	Buy drug from grocery store, and traditional home treatment.
8	3 months	Kamoh Kapah	Malaria	Fever, no jaundice, liver and spleen enlargement (1 week)	Buy drug from grocery store, and sacred healer
9	9 months	Thacha Her Ler Muu Pher Pher Pue	Chronic diarrhea	Chronic diarrhea with bloody mucous since 2 months until died. (suffered by this symptom periodically)	Buy drug from grocery store, mobile clinic, district hospital.
10	12 months	Drowning	Drowning	-	No treatment
11	41 days	Tacha Phutha	Meningitis	No fever, vomiting, depression, convulsion, and unconscious (5 days)	Buy drug from grocery store
12***	8 days	Pre-mature baby	Respiratory distress syndrome	After birth the baby was not crying and breathing. (8 days)	District hospital. After resuscitation, the baby was referred to provincial hospital and kept in incubation for 8 days

* Local term ** Verbal autopsy based on World Health Organization (Anker, M. et al. 1999. *A Standard Verbal Autopsy Method for Investigating Causes of Death in Infants and Children*. (WHO/CDS/CSR/ISR/99.4). Geneva, World Health Organization) *** Mon child

Karen people in the village generally conceive that death among newborns or babies aged a few months old are caused by a *'child's ailment'* or *Tacha Phutha,* which is a broad diagnosis. They also divide *Tacha Phutha* into 3 different types according to the skin colors of the dead babies, which are black, red and white. Most Karens conceive that this sickness occurs from an unknown cause, however, some mothers explain that it results from coldness. Normally, according to their experiences, babies who die from this disease do not show noticeable symptoms. The pathogenesis develops rapidly inside the baby's body, so one cannot visually detect any abnormal signs from the outside. They can identify the cause of death of a given child after he/she has already died, because of the indication by the skin color of the dead baby. The black type of *Tacha Phutha* is considered as an unpreventable sickness. Also, it is the most harmful and severest sickness, as it can hardly be cured. Some Karens believe that it can be cured by magic spells or drinking a mixture of water and ground tiger's canine tooth or bone. Since a tiger's canine tooth can scarcely be obtained at the present time, the disease is believed to be uncureable. Therefore, most of the disease victims usually die. Its symptoms are difficult breathing, drowsy, blue skin, fever or no fever. The disease can cause rapid death. After dying, the victim's skin color becomes dark blue. Among the deceased Karen children, 4 mothers out of 11 indicated that the deaths of their babies were caused by *Tacha Phutha type black*. However, the other 2 types of *Tacha Phutha*, type red and type white, are not life-threatening illnesses. The symptom of the former is red circles on the body's skin or a rash and the latter is white circles on the skin and itchy, which can be cured.

Another cause of death that is frequently found in addition to *Tacha Phutha* is *Kamoh Kapah.* Karens conceive that this sickness can happen to both children and adults. Its symptoms are a palpable mass below either one side or both side of the costal border, chilling or may be not chilling, vomiting, and jaundice (in some cases). According to observation[17] and in-depth interviews, this sickness seemed to be as malaria in medical terms. However, Karen people explained that *Kamoh Kapah* and malaria are totally different. *Kamoh Kapah* has been commonly known since they

[17] During the fieldwork, many adults suffered from the sickness called *Kamoh Kapah*. Some of them who sought the treatment from the malaria screening unit or the district hospital were diagnosed as malaria.

were in Myanmar, but malaria was just heard of when they came to Thailand. Their perceptions toward the etiology of both diseases are not the same. They believe that the cause of *Kamoh Kapah* results from an organ in abdominal cavity moving down due to jumping. The striking force can dislocate the organ downward. Some comprehend that this organ is a lung, while others do not know what it is; they just know that nothing should palpable on an abdomen in a normal condition. Children will be diagnosed with *Kamoh Kapah* when they get sick and a lump is palpable around their costal borders. On the other hand, malaria is known by most Karens as a disease that results from mosquitoes. They know this health knowledge because public health officers regularly come to check and give blood tests for malaria and distribute free mosquito nets, and simultaneously, they give malaria education to the villagers as well. The perception on pathogenesis of *Kamoh Kapah* has a major effect on the treatment. The Karen people have strong belief in curing the disease by sacred healers. Regarding to their treatments, the sacred healers mainly use herb and magic spells by chewing the mixture of betel nut, betel vine, garlic, pepper, and herbal root until the mixture is crushed into small fragments. Then, they mutter incantations and blow the mixture on child's abdomen, and next, they wrap the abdomen with cloth. Karens believe that this treatment can help the organ that moved down to revert to its normal position and the child will recover. All 3 Karen mothers who signified that their children suffered from *Kamoh Kapah* sought this treatment for their children, and did not take their children to have a blood test for malaria.

There was only one mother who was informed by the doctor at a hospital that her son died from cerebral malaria, but according to her understanding, she perceived that her son died from high fever *(Tacha Boh)* because her son had a fever, chills, and vomiting, but a palpable mass around his abdomen was not detected. Thus, she primarily thought that his sickness was not *Kamoh Kapah.* She decided to buy *paracetamol* (the medicine for relief of fever) from the grocery store to cure the sickness after the first two days of the fever. The grocery store's owner, also a village healer, advised her to take her son to have a blood test for malaria at the malaria screening unit, because the health providers usually educate the villager that if anyone has a fever, it should firstly be assumed that he/she is likely to be infected with malaria since the village is the epidemic area of the disease. The following day after the blood

test, she was told that malaria was not found and the health provider gave her son some *paracetamol*. Two days later, his symptoms got worse with high fever and severe vomiting, so she took her son to have a blood test the malaria screening unit again. While waiting for the blood test's result at home, she noticed that her son became drowsy, had convulsion, and was finally unconscious. Therefore, she decided to take him to the district hospital. There, her baby was resuscitated for about 10 minutes and then died.

Tha Mhok (measles) is a common disease among children in the Karen village. There is an outbreak of this disease every year[18]. According to the Karen perception, the disease is believed to be a non-communicable disease, which happens to only children. Karens believe that all children have this disease in their body since they were born. At an unspecified time, the disease will emerge. The children will suffer with this disease at different ages. The Karens could not explain why some children have it as a toddler, some suffered at their pre-school age, or at school age. The symptoms of *Tha Mhok* are high fever, coughing, runny nose, red face, and conjunctivitis. The fever will be high for 3-4 days. After the fever decreases, rash appears over the entire body. Generally, Karens perceive that *Tha Mhok* is not a severe disease if rashes are found. However, if a rash does not appear, it is believed to be dangerous as it can lead to death. They call this type of *Tha Mhok as* '*Tha Mhok Ngo*'. All Karens relatively scared of this type. The data gathered from the Karen village healer and the elderly revealed that there were a lot of children dying from *Tha Mhok* several years ago. In some years, there were 13 cases of death.

The Karens treat their sick children during periods of high fever by taking traditional Thai medicine[19] or western medicine *(paracetamol)* to relieve the fever. Before the popularity of western medicine in the village, Karen people used herbs to treat their fever. Even nowadays, some people still use this treatment. When the fever diminishes, the remedy is focused on how to stimulate the rash which Karens believe submerges inside the sick body, and later appears on the skin. In order to do this, the

[18] During the field work, it was a time of measles outbreak. There were 6 children less than 5 years old who got sick with this illness.
[19] This kind of medicine is well known in Thai term as *Ya Kyeal*.

sick children are encouraged to eat eggs so as to stimulate rashes to appear outside the body. In addition, they take a kind of fresh-water shell called '*Mito*' (red-rimmed melania) and soak in water and let their children drink it all day. In some cases, the water soaked with *Mito* is used to apply on body or to bathe. The offensive smell of this kind of shell is believed to stimulate rashes inside a sick body to appear on the outer skin. Moreover, the water with *Mito* is used to cure conjunctivitis by dropping it on children's eyes. According to observations during the field work, it was found that all children who suffered with *Tha Mhok* were treated with this kind of treatment. There was a 15-months-old child who died of *Tha Mhok*, according to his mother's explanation. His mother said that her child was thin and more frequently caught a cold as compared to neighboring children his age. She fed her child with breast milk and gave him 3 meals a day. Most of the meals were a mild soup of roselle, pumpkin, and wild vegetables depending on what she could afford. Meat and eggs were fed to him occasionally. He was vaccinated by a mobile medical unit only two times (no document of vaccination). During his illness, he had a high fever for 5 days. At this stage, the mother bought *paracetamol* from the grocery store to treat him. After that, he had some rashes on his body. His mother used *Mito* to treat him as other people did. She soaked *Mito* shells in rain water without boiling and gave it to him to drink three times a day. In the second week, he got diarrhea about 10 times a day, and still had a fever, so, his mother bought an antibiotic for him. Then, his diarrhea disappeared, but he had a sore mouth that made him able to swallow merely a little water and milk when feeding by spoon, but he could not eat other kinds of food. He suffered with this kind of symptoms another 1 week. Then, he became drowsy, skinny, sunken eyes and a weak cry. The neighbors visited her at home and suggested to take the child to the hospital. She and her husband planned to follow their suggestion the next day. Unfortunately, he died at midnight before going to the hospital.

"He had a high fever for 4 days. Children of my relatives were suffering from this kind of disease (Tha Mhok). My child suffered nearly 2 weeks before he died. We believe that if a rash appeared on the body, a child could get rid of this disease. But very little rash appeared on my kid's skin. So he died because the disease was still submerged inside his body."

Thacha Her Ler Muu Pher Pher Pue: The mother who reported that her child died by this cause believed that the sickness might be transmitted from mother to the baby during pregnancy, because the baby got sick when she was only 2 months old. However, the mother could not explain about this cause of illness, and she refused of getting sicknesses during pregnancy. The mother fed the sick baby with breast milk since childbirth up to 2 months, but then changed to sweetened condensed milk due to insufficient breast milk. However, because of her poverty, she alternatively fed her baby with breast milk and sweetened condensed milk without other supplementary food. The baby was skinny and defecated bloody mucus periodically. Her sickness occurred and recovered alternatively up to 9 months old. The mother used to buy *paracetamol* to treat the disease of her baby. But after getting better, the child got the disease again. Once, she took her baby to be examined by the mobile medical unit and the health provider gave the baby some medicine to take, but it didn't get better. Before the baby's death, she got diarrhea, often containing blood and mucus, for 4-5 times and became weak, drowsy, and pale. The parents took their baby to the district hospital. The doctor informed the parents that the child had low level of blood volume and suggested to have an advanced treatment at the provincial hospital. Due to their economic hardship, they decided to take the baby back and cure her at home with basic medicine from the grocery store. About one week later, the baby died. According to her lack of health knowledge on food care, the mother did not feed the baby with proper food and did not add timely supplementary foods to enhance the baby's health and immune system. A malnourished child is more vulnerable to infection than a well-fed child. The baby probably got infected due to malnutrition and contaminated preparation of sweetened condensed milk. Moreover, the mother also believed that the illness developed since pregnancy. So, other factors causing the illness were ignored.

In short, it was found the nexus of belief about the causes of illness and death among the Karen. The mothers whose children died didn't have an idea about communicable diseases. Therefore, the explanations on pathogenesis are still based on old beliefs. As a result, some cases were untreated, some delayed to get treatment, or went to an inappropriate health facility or provider. However, it was not only their local beliefs that contributed to child mortality, but also other factors described before.

Regarding the Mon sample, there was only one child under 5 years of age who died during the past 5 years, so there is not enough data about their beliefs concerning causes of death to reflect the big picture of Mons. So, beyond the causes of death, questions about sickness experiences were asked. The results show that folk medicine is not popular among Mons. Most of them, usually buy medicine from the grocery store when their children have simple sicknesses as a cold, stomachache, diarrhea, and so forth. If the children do not get better, they usually take their children to the health center or hospitals. Continual contact with professional health providers lets Mons perceive illnesses and diseases according to the viewpoint of western medicine. When asked about the causes of illnesses from which their children suffered during the last 6 months, they usually reveal the names as informed by the hospital, such as pneumonia, measles, asthma, or malaria. However, they don't explain the causes of diseases in a western way. They still relate them to traditional beliefs as they have learned from their ancestors. For instance, pneumonia results from cold weather, a common cold is from playing in rain, and diarrhea is due to eating strange food or improper food for children such as ripe mango.

The mother whose baby died indicated that the death was from an incomplete pregnancy. Earlier, she got an abortion for her first pregnancy. A doctor advised her to have family planning for a period of time before the next pregnancy. However, because of her desire to have a child, she decided to stop taking oral pills. Finally, she got pregnant again and had antenatal care since the first three months. Then, she went to hospital as appointed regularly. There was no sign of any complications until the eighth month of pregnancy. Her fetus movement became less than usual. Subsequently, she got labor pains and her amniotic fluid was beginning to leak. When she went to see the doctor, she was admitted at the district hospital. She had no fever and gave birth 2 days after labor onset. Her child was a premature baby weighing 1,300 grams. At birth, the baby didn't cry at all, so the baby was resuscitated, given oxygen and referred to the provincial hospital. The baby was kept in an incubator for 8 days before dying. The death of the baby was not related to beliefs on causes of disease.

4.8 Conclusion and Discussion

The purpose of this study was to describe and understand the factors that contributed to mortality differentials between Karens and Mons in their cultural context in Kanchanaburi province. Ethnography together with medical science were the relevant research approaches that made it possible for this study to explore in a holistic perspective and discover how the factors influenced child survival in two ethnic groups in different ways.

This study adopted the conceptual model of Mosley and Chen (1984) to explore inequality in child mortality. They developed this model for investigating child mortality in developing countries, thus the key concepts primarily involve infectious disease and malnutrition as the main causes of infant and child mortality in poor populations (Mosley and Chen, 1984). In this study, Mosley and Chen's framework could be used to facilitate an understanding of the linkage between socioeconomic and proximate determinants affecting child mortality in the two minority groups. Interestingly, due to the ethnographic approach, a crucial theme that is important in a study related to ethnic diversity, ***"assimilation"***[20]**,** emerged beyond the Mosley and Chen framework. This emergent theme played a central role in explaining why Mon children are less likely to die than Karen children. Assimilation was influenced by socioeconomic and proximate determinants.

Assimilation is a major transforming force affecting child health and human development. The assimilation process affects a range of behaviors, values, and beliefs. Health behaviors are also shaped and influenced by assimilation (Maxwell, Bastani, and Warda, 1998). Typically, individuals or groups with the most contact with the dominant culture, by virtue of participation in the larger community through work, schooling, or other activities, will assimilate more rapidly and in more domains than individuals or groups with less contact **(**Bornstein and Cote, 2006).

---

[20] The term *"assimilation"* describes a change in individual or group identity that results from continuous social interaction between members of two groups such that members of one group (often a minority culture group) enter into and become a part of a second group (often a majority culture group) (Breslow, 2002).

Both Karens and Mons in the studied village reported certain aspects of assimilation, but the levels of assimilation were different between them. The life style of the Karen appeared to be uncomplicated and isolated from most of the rest of the world. However, some of them had a chance to blend into the Thai mainstream by attending Thai school, intermarrying with Thai men, living in Thailand for a long period of time, and having an experience of working in the urban fringe. In contrast to Karens, Mons had a vibrant economy and far more open society. Mons seem to be assimilating people. The way of assimilation of Mons was fairly different from that of Karens; their education was not the track merging them to the dominant culture. Their assimilation process was facilitated through mobility. Mons moved frequently and often lived and worked closely with Thai people, which led them to absorb the mainstream culture. Mons exhibited improvements in lifestyle as they assimilated.

The discussion on how socioeconomic determinants on three levels- community, household, and individual levels- operate through proximate determinants (maternal factors, environment, child care, and health behavior) is discussed simultaneously through the perspective of assimilation as described below.

Socioeconomic determinants

Community level: ecological setting

At the community level, there were certain different features between the two studied villages that led Karens to be placed in a disadvantage situation. However, even though the two villages had some similar aspects, Mons still did not struggle with these shortcomings like Karens because there were other factors to improve their children's survival chance.

Although, both Karens and Mons lived in remote areas along the border, the Karen village was comparatively more difficult to access than the Mon village. The transportation was limited depending on the climate conditions. Moreover, travelling cost was relatively high when compared with their income. This is one reason that caused Karen parents to delay taking their sick child to the hospital, while Mons did not hesitate to do so. Even though health care institutions were not located in the Mon village like the Karen village, the physical structure of the Mon village together with

their financial capability facilitated Mons to seek health care services outside the village more comfortably than Karens. The survival chance of Mon children was not impeded by travelling.

Moreover, the remoteness of the Karen village had affected to the variety of food crops, meat, and other animal products. The pattern of infant feeding and children's diet may have been shaped by environmental circumstances. Inappropriate cultural beliefs and practices caused Karen mothers to give their children diets that are lower in quantity and quality than those Mons could provide. In the Mon village, there was a variety of foods and Mons have the potential to afford them. Karen children were much more frequently reported to be underweight for their height and age than Mon children. Inadequacies in nutritional intake of Karen children eventually resulted in high incidences and increased severity of infectious diseases, leading them to be at greater risk of dying than healthy Mon children.

Table 4.6 Socioeconomic determinants at the *community level* affecting child survival differences between Karen and Mon children

Factor	Findings		How does it affect child survival chance?	
	Karen	Mon	Karen	Mon
Community level Ecological setting	Difficult to access - Transportation is limited by climate conditions - high travelling cost	Accessible - Transportation is convenient - variety of food	- Delay to seek the treatment for sick children - Do not use health services	- Do not hesitate to use health services and treatment
	Limited source of food	Variety of food from both inside and outside the village	- Children have insufficient quantity and quality of food	- Children were well fed by a variety of foods

Household level: economic status and cultural traditions of a household

Generally, many studies have shown a positive relationship between assimilation and health. For example, a study among Hispanic women found that the members of the more assimilated group were more confident in their abilities to acquire health-related information and to seek assistance than the less assimilated group (Hubbell et al., 1996). This positive relationship was also found in this study. Mons which had higher level of assimilation than Karens, tended to improve in socioeconomic status -which means better income, better access to health services, and therefore a greater likelihood of having better health.

The Mon's life style had been changed. They inevitably adopted wage economy and moved up in socioeconomic status, as well as adopted new values in their life. Despite the fact that they earned more money than Karens, they also spent more money on luxury goods like Thai traditions and spent lots of money for childrearing. This way of life reduced the value of their children. Conversely, Karens still earned their living mainly on subsistence agriculture and their positive perception on their children still remained due to the expectation that when their children become economically active adults, they will provide comfort and support for them. Thus, according to the ***"Wealth Flow Theory"*** (Caldwell, 1982), it can be said that assimilation had changed the direction of wealth among Mons; wealth flew downward from parents to provide for children's well-being. While, for most Karens, wealth continued to flow upward to the parents. The perception of value of children affected the fertility among these two groups. Mons were more likely to use contraceptive methods to control fertility in accordance with their economic conditions. This economically rational response decreased the number of children that tended to extend birth intervals, as well as led Mons to be better able to provide sufficient food intake for their children, which produced a potential to contribute the chance of child survival. On the other hand, the unassimilated Karens preferred a large number of children, thus they were less likely to use contraceptive methods and had the idea about having more children to ensure or replace the children who died. Their high fertility caused short birth spacing, insufficient care and food intake for their children, leading to poor nutritional status and poor hygiene, which was an important determinant of unhealthy children.

Table 4.7 Socioeconomic determinants at the *household level* affecting child survival differences between Karen and Mon children

Factor	Findings		How does it affect child survival chance?	
	Karen	Mon	Karen	Mon
Economic status	Low income (Subsistence living)	Have income 3 time higher than the Karen (Wage earner)	- could not afford the cost of health services and travelling cost - could not seek food outside the village	- have financial support for health service expense and sufficient food intake for children
Value of children	High value	Slightly decreased value	- prefer a high number of children (4) - high fertility (average CEB 3.7) - having children to replace and ensure for the children that die - short birth spacing	-prefer lower number of children (3) -lower fertility (average CEB 2.3) - longer birth spacing - more likely use contraceptive methods than the Karen
Woman's status	High	High	- could allocate household resource - could make a decision on contraceptive use and child treatment	- same as Karen

Furthermore, the high survival chance of Mon children was indirect affected by assimilation of traditional customs: women's status and value of children. Traditionally, the status of Karen and Mon women was slightly lower than that of men, however, they had capacity in terms of allocating household resources, making

decisions on child care and using contraceptive methods. Women's status among both studied ethnic groups yielded a positive effect on child survival chance; they had the capability to provide good care for their children, and could used family planning methods to control their fertility liberally that means their risk fertility behaviors were reduced. Even though the Karen women's status seemed to benefit their children's survival chance, other factors as indicated above had more strong influences than their status. In the case of Mons, even though cultural and religious beliefs among them were prone to promote male's status and Mon wives still pay respect to their husband. This kind of norm did not show a negative effect on Mon women's status because not only Mon females but also Mon males had been assimilated to the mainstream, so Mon husbands also recognized the benefit of health care utilization for their children. Hence, Mon wives had autonomy in decision making, life options and control over resources with support from their husbands.

Individual level: education, beliefs and perceptions

Assimilation has an influence on knowledge and attitudes of Karens and Mons. It shapes and influences health perceptions and behavior. The child survival chance of Mons who had a high level of assimilation, is more likely to be higher than Karens with lower assimilation. The findings indicated that education and having an experience of working in an urban area lead Karens and Mons to assimilate the health perceptions and practices of mainstream culture. Education affected the differences in child mortality among Karens, but it did not play an important role among Mons. Mon child care beliefs and practices had been modified because of repeated and long exposure to Western models of care, including close contact with Thai neighbors or Thai employers. Assimilated groups tended to use health care services to enhance maternal and child health.

Table 4.8 Socioeconomic determinants at the *individual level* affecting child survival differences between Karen and Mon children

Factor	Findings		How does it affect child survival chance?	
	Karen	Mon	Karen	Mon
<u>Individual level</u> Education (head of household and mother)	Low	Low	- educated mothers tended to use health care services	- no difference in terms of use of health services between educated and uneducated mother
Ever worked in urban area	36% for head of household 38% for mother	85% of head for household 63% for mother	-Those who had an experience of working in urban areas tended to use health services	- same as Karen
Beliefs and perceptions on health and illness	- Most Karens adhere to traditional beliefs - rarely contact to health information	Get information from health providers	- perceive some infectious disease as non-infectious disease - use traditional treatment - lead to chronic or severe sickness	- use modern health care for prevention and treatment

Proximate determinants

All socioeconomic determinants affect the proximate determinants in different magnitudes according to the level of assimilation. Mons knew how to use contraceptive methods to control their first birth, even if they get married as early as the Karens, and their low value of children also influenced parity and birth spacing.

Table 4.9 Proximate determinants affecting child survival differences between Karen and Mon children

Factor	Findings		How does it affect child survival chance?	
	Karen	Mon	Karen	Mon
Risk fertility behavior Age at first birth	1 in 3 get married at age less than 18 years and do not use contraceptive methods	Same as Karens, but Mons use contraceptive methods to control fertility for 2-3 years before having first birth	- physically and psychologically ***immature*** for first birth	- physically and psychologically ***mature*** for first birth
Parity	High (average number of CEB 3.7)	Lower (average number of CEB 2.3)	- short birth spacing - could not provide sufficient food intake for children	- longer birth spacing - could provide sufficient care for children (food , vaccination)
Birth spacing	50% of Karen mother have short birth spacing (20-28 months)	Most mothers have long birth spacing (30-44 months)	- stop breastfeeding because of getting pregnant	- breastfeed the child up to one and a half to 2 years
Environmental contamination	Pervasiveness of malaria - ineffective malaria screening unit - perceive cause of malaria according to traditional beliefs	Same as Karen - effective malaria screening unit - perceive cause of malaria following medical knowledge	- high incidence of both children and adult suffered from malaria - inappropriate treatment	- rare cases of malaria

Table 4.9 Proximate determinants affecting child survival differences between Karen and Mon children (cont.)

Factor	Findings		How does it affect child survival chance?	
	Karen	Mon	Karen	Mon
Nutrition -breastfeeding	Almost children were breastfed up to 2 years	Same as Karen	- reduce the risk of contaminated milk - nourish infant - enhance immune system	Same as Karen
Supplementary food	Mainly rice and salt	More than 50% of mothers gave supplementary food following health provider's suggestion	- 33% mildly under weight - 12% moderately underweight	- 10% mildly underweight
Health behavior Antenatal care	15% of mothers attended antenatal care	55% of mothers attended antenatal care	- complications during pregnancy - some complications could not be detected and treated	- safe pregnancy
Delivery care	83% of childbirths were attended by untrained TBAs	53% of childbirths were attended by untrained TBAs	- some babies of abnormal and complicated pregnancy died	- safe delivery
Vaccination	15% of children got timely recommended vaccines	53% of children got timely recommended vaccines	- got sick and died from preventable disease	Did not die from preventable disease

Because the geographical setting of the two villages was connected to large forested areas, malaria was pervasive in both of them. But the Mon children and other villagers suffered from this sickness much less than Karens. In the Mon village, a combination of trained health volunteers and a malaria quick test (Para check) functioned for malaria control and anti-drug resistance, whereas the location of a malaria screening unit that was responsible for the Karen village did not support malaria control and treatment properly. Three Karen children had died by malaria infection, and during the fieldwork, the researcher also found around 1-2 cases per week[21] of Karen villagers who suffered from malaria including even pregnant woman. Several cases suffered more episodes of malaria and adverse birth outcomes.

Besides, living in a high risk area of malaria transmission and lack of proper health care services, Karen's beliefs about causes of illness is also closely affected child survival chance. They perceived "*Kamoh Kapah*" and several illnesses as non-infectious diseases, which in turn affected their preventive and curative practices. On the other hand, although Mons also perceived causes of illness related to their traditional beliefs, whenever their children got sick, they usually took them to be treated by professional health providers. Consequently, repeated contact with modern medical care made Mons adhere to Western medical understanding of health and illness.

Mons were more likely to attend antenatal care and deliver in a hospital than Karens, which reduced the risk of pre-neonatal death among their children. Additionally, relying on professional advice, Mons added some proper supplementary foods to nourish their babies and took them to visit the well-baby clinics and to get vaccinations. These practices enhanced the nutritional status and immunity of Mon children that in turn served to strengthen child survival chance and reduce postnatal death.

[21] Some of them were diagnosed from the malaria screening unit or hospital, and some their symptoms quite related to malaria; periodic high fever, rigor, severe headache, and vomiting.

Limitations

As this research is cross-cultural study and the researcher was unable to communicate with ethnic people via their ethnic languages, the data collection was operated through the facilitation of local translators. This could have caused some data to be distorted, missing, or lost in translation. However, the researcher attempted to minimize these shortcomings.

In addition, the data on pregnancy history and experience of deceased children were retrospective data. Most Karen mothers had many children and some had several children that had died. During the interview, they could not express a clear memory and often forgot and were confused about the chronological order of their dead children and living children. It is their nature that they do not record the date of childbirth, except for those who are educated or having birth at a hospital. Therefore, the age of children in this study was a rough estimate. Furthermore, it was hard to investigate the cause of death using a verbal autopsy because of two reasons: firstly, they could not recall all events that occurred during the time leading to the death of their children. Secondly, their perception about cause of illness and cause of death had been shaped by their local traditions. They clarified them with simple explanations that were not as complicated as that of the Western medical perspective, so they could respond to questions in the verbal autopsy in a very limited manner.

CHAPTER V
CONCLUSION AND RECOMMENDATION

In this chapter, the important themes are highlighted, conclusions are summarized, and recommendations are made for policy implications. In particular, consideration is given to how this study might be used to assist the development of priority action for reducing inequality in child mortality.

5. 1 Conclusion

This study aims to explore child mortality rates among nine ethnic groups in Thailand at national level using the 2000 population and housing census. Due to the limitations of this data, the language spoken in a household was used as a proxy to identify the ethnicity of the samples and an indirect demographic technique was employed to estimate the mortality rates. Additionally, this study aims to investigate the factors contributing to inequality in child mortality. Unfortunately, the data at the national level was not sufficient for inferential statistics to test the relationship between child mortality and particular interested variables. Only socioeconomic factors could be analyzed through indirect demographic techniques to investigate socioeconomic inequality in child mortality. Further, beyond the accessible data in the national census, there were certain essential factors, particular cultural beliefs and practices that needed to be explored. Therefore, a qualitative method was applied for in-depth analysis to explain the mortality differences among ethnic groups. Two ethnic groups, Karen and Mon, were selected as ethnic samples to explore the mortality disparity in their village context in Kanchanaburi province. Even though this study had some limitations, useful findings were found for policy makers to improve child mortality rate and increase inequality in health among disadvantaged groups in Thailand.

Levels and trends of Under-five Mortality rates

This study indicates that under-five mortality rates are different among the 9 selected ethnic groups during the reference years, 1986 to 1996. Chinese had the lowest child mortality rates followed by Thai, Khmer, Malay, and Mon, respectively, whereas ethnic hilltribes had a higher rate than the former groups. Among hilltribes, Hmong had the lowest rates, while Karen and Lahu had higher mortality rates than the other hilltribes. However, there was a declining trend in the rates of U5MR over time in almost all ethnic groups. Similarly, at the village level, Karen also had comparatively higher number of child deaths before the age of 5 years than Mon during the 5 years preceding the fieldwork.

Factors contributed to inequality in child mortality

Both data sources together with two methodological approaches were used to investigate the factors related to child mortality differentials among ethnic groups. It is significant that the analysis at the national level clearly illustrates the socioeconomic inequality link to child mortality among the nine ethnic groups. On the other hand, the findings from the qualitative method yields more details and powerful indicates in the village context as to why mortality disparity occurs among Karen and Mon. Even though the two ethnic groups were fairly similar in terms of geographical setting, legal status, and level of education, this study explored factors related to Karen and Mon, linked to mortality differentials between them.

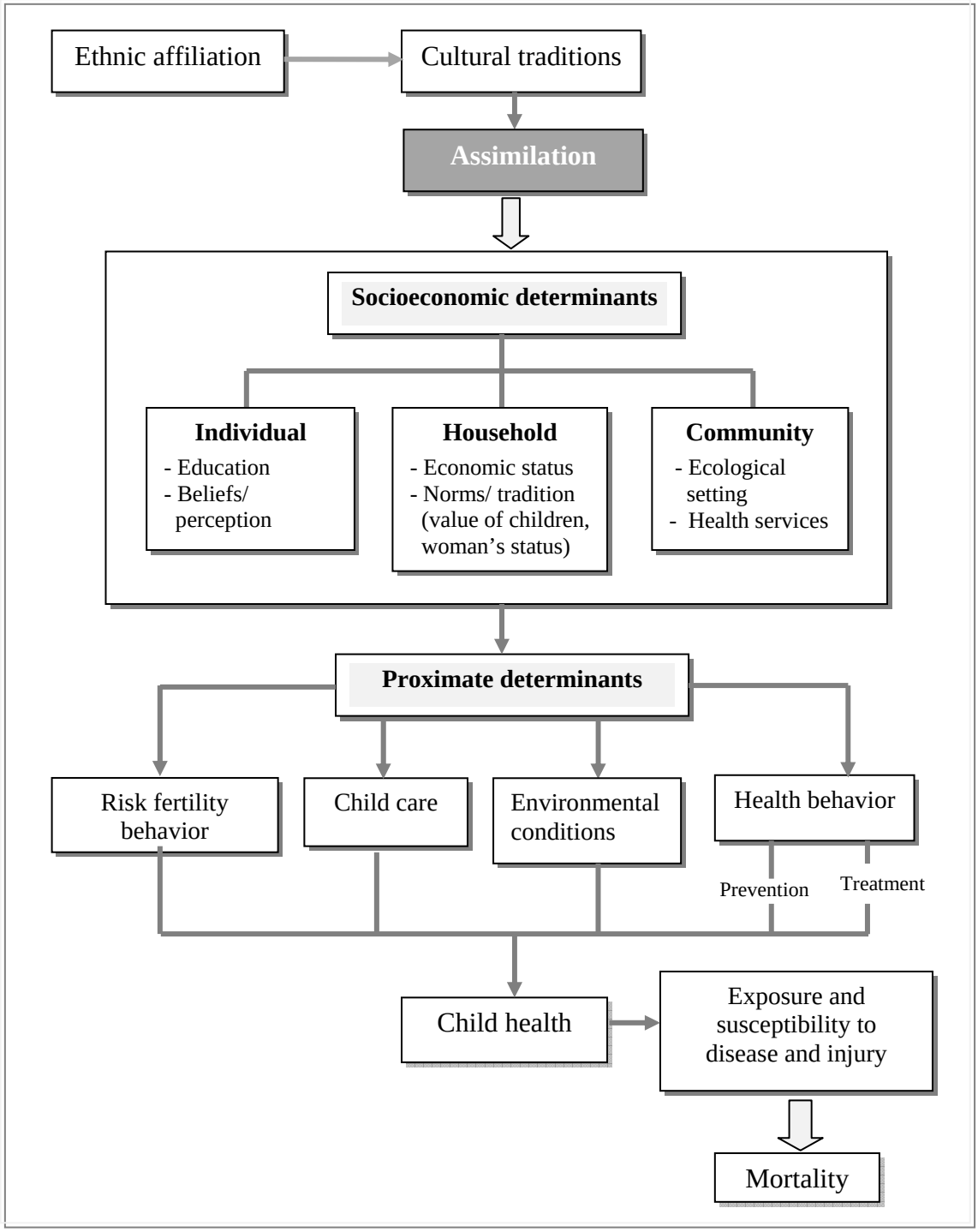


Figure 5.1 The proposed model to study inequality in child mortality among ethnic groups

Mosley and Chen's analytic framework (1984), used in this study provided a basis for exploring disparity in child mortality among ethnic groups in Thailand. A set of socioeconomic determinants illustrates how they operate through proximate determinants to influence mortality in children under-five years of age. But, this study found a principal factor, '***assimilation'***, emerged beyond Mosley and Chen framework (1984). This key factor plays an important role in explaining the differences in child survival chance among ethnic groups by the way in which its influence contributes through socioeconomic determinants and proximate determinants. It suggests that child mortality research, especially among ethnic groups, should include assimilation issue in the conceptual model (Figure 5.1).

How does assimilation activate through the socioeconomic and proximate determinants to influence survivorship of minority children? The study shows that the variation in child mortality between ethnic groups could be explained by their different life styles which were partially shaped by assimilation of mainstream culture. The Mon who had a higher probability of survival than the Karen, moved habitually to settle and find work close to Thai people, while Karen maintained subsistence living and lived within a closed society. This factor had allowed Mon to have much more assimilate to the dominant Thai society. Assimilation was shown to have a positive relationship with child survival in two ways. It initially operates on socioeconomic determinants and its consequences impact a set of proximate determinants that directly influence the risk of mortality.

Firstly, the assimilation led Mon to raise their economic status. Thai communities that Mons often within, were economically active, hence, both male and female Mons, participated actively in the wage economy that assisted them in improving their economic status. Mon had income three times higher than Karen. Although health care stations were not located in the Mon village and there were some health service and travelling costs, their financial power enables the Mons to access health care services outside the village.

The analysis at the national level also confirms a strong relationship between socioeconomic status and child mortality rates. Among the nine ethnic groups, Chinese had the highest socioeconomic status, while Thai was second and Malay, Khmer, Mon, and hilltribes followed, respectively. Most hilltribe households were in the lowest socioeconomic strata. Within this category, Hmong appeared to have a better socioeconomic status than other hilltribes, while Karen and Lahu were less well-off. Child mortality rates were noticeably higher in the lower SES groups. Conversely, rates were lower in the high SES groups. Chinese, in the highest socioeconomic position, enjoyed the lowest rates of U5MR followed by the majority Thai, Khmer, Malay, and Mon, while ethnic hilltribes, concentrated on the low socioeconomic statra, suffered from high rates of U5MR. Moreover, the findings on differentials in U5MR between the highest and the lowest socioeconomic status within each ethnic group indicated that the ethnic Thai had the smallest magnitude of disparity, while ethnic hilltribes had relatively large gaps between rich and poor.

Secondly, assimilation empowers Mons in terms of health knowledge and perceptions. They freely adopted Thai behavior, including health practices. Furthermore, health information and advice from Thai neighbors, Thai employers and health providers help to shape their world-view. The assimilated perceptions influence all proximate determinants. Assimilated Mons are aware of the benefits of the use of health care services that in turn leads them to use contraceptive methods, attend antenatal care, give birth at the hospital, feed the children according to professional advice, and take the children to clinics for vaccination and physical development monitoring. These practices increase child survival chances in Mon children. Additionally, Mon's perception of the value of children has changed gradually. It yields a positive outcome for child survival as it reduces risky fertility behavior (e.g., high parity, and short birth spacing).

Meanwhile, Karen practiced subsistence living in inaccessible locations leading them to have less assimilation than Mon. These conditions meant that Karen had to put up with uncomfortable transportation, heavy exposure to malaria, and insufficient variety of food. Furthermore, low income and lack of health information and knowledge impeded the Karen to seek professional health care services. Only the

better off, educated Karen and those who were exposed to urban culture realized the benefit of modern medical care and used it. This suggests that assimilation for whichever ethnic group provides positive outcome for child survival.

Even though the dominant culture influences on the perspective of minority groups, they still adhere to certain traditional beliefs. Cultural beliefs and practices related to child health found in this study are addressed in two aspects: useful and adverse effects on child survival. A cultural tradition among Karen and Mon which is interpreted as beneficial practices for child health and survival was breastfeeding and the use of food prescription nourishing lactation. Both ethnic groups perceive breastmilk as the best diet for infant and young children, thus they feed their children up to one and a half or two years old, In addition, they also eat certain foods to increase breastmilk. The essential nutrients, antibacterial and antiviral agents in breastmilk protect the infant against disease. Adverse beliefs and practices, mostly found among Karen, such as attitudes towards supplementary food for infants, belief in blood effect, the side effects of sterilization, and beliefs about the cause of illness.

By all accounts, this study found that the availability of health care services plays a crucial role on child survival among disadvantaged groups. Due to the remote location of the Karen village and poor economic status, Karens face a lack of availability and accessibility to health services. Most pregnant Karen women cannot benefit from antenatal care and modern health care for childbirth. The peri-neonatal deaths of Karen children are probably the result of their mothers' failure to use health care services. Additionally, most Karen children fail to complete the full course before their first birthday and nearly a half of them have poor nutritional status. Incompleted immunization and malnutrition may lead Karen children to exposure and susceptibility to disease. Some deceased Karen children suffer from infectious and vaccine-preventable diseases.

5.2 Recommendations

Since ancient times, Thailand has experienced a blended culture with various ethnic groups living together with the majority Thais. Throughout history, Thailand has used an integration policy to assimilate all ethnicities into a unity society; however, various ethnic groups still maintain their own culture. Despite decades of rapid development, many groups in Thailand have been left behind, particularly ethnic minorities. This inequality is a longstanding problem, and the situation is becoming more critical with growing civil unrest in the southernmost provinces. It is time to address the ethnic issues as a major focus of interest in Thailand. Primarily, equality in health status is essential for these groups. This study proposes some recommendations that would be beneficial in reducing inequality in child health and mortality among disadvantaged minorities.

5.2.1 This study confirms that child mortality rates are evidently different among ethnic groups. The disadvantaged groups are more likely to have higher mortality rates than the majority Thais, especially the ethnic hilltribes, whose the rates are 2-3 times higher than Thais. Therefore, ethnic hilltribes are the significant groups for policy attention to achieve the fourth Millennium Development Goal. Within this category, Karen and Lahu are primarily urgent ethnic groups to reduce child mortality.

5.2.2 This study found some findings that can be recommended as the way to reduce inequality of child mortality among ethnic groups.

5.2.2.1 Findings from both the quantitative and qualitative methods indicate a strong relationship between socioeconomic status and child mortality. The child mortality rates were remarkably low in the high SES groups. Even though Mon has lower legal status and education than Karen, their economic status allows them to access medical care and provide sufficient food for their children. Improvements to the socioeconomic status of the hilltribes will enhance their financial ability to provide health care and sufficient foods for their children.

5.2.2.2 However, to lift the socioeconomic status of disadvantaged group it might take time and budget. The economical and effective way to enhance child survival among these groups would need to address the health education, particularly with respect to supplementary food, hygiene, and germ theory. The health information may let them to gain biomedical knowledge which would benefit for children in terms of prevention and treatment. However, the policy implementation on health education should be concerned and considered of which perceptions or behavior should maintain or modify as some ethnic groups have their local wisdoms which are useful for child health. For example based on the two ethnic groups used in this study, both Karen and Mon retain cultural practices contributing to child survival, such as near universal and prolonged breastfeeding, and the use of nutritious foods which facilitate lactation. On the other hand, some health perceptions and practices do not benefit the child's health, such as child diet, using contraception (e.g., delay contraceptive injection, beliefs about side effect of sterilization), beliefs about of cause of illness, and food proscriptions during pregnancy and lactation period.

5.2.2.3 Assimilation towards modern culture in terms of health perception (e.g., cause of disease and food supplements) and health practices (e.g., antenatal care, immunization, and child growth monitoring) shows positively impact on the chances of child survival. It suffices to indicate that these traditions are worthy to follow for improving child survival. In addition, the process of assimilation seems as a simple way to follow, automatically learning, and appropriate track for minority groups to improve child health status. Promotion of harmony between ethnic minorities and the majority Thais without discrimination would be one way of encouraging assimilation in order to enhance the health status of minority children. Even though assimilation suggests positive outcome for child health, cultural diversity must be seriously concerned and maintained.

5.2.3 A serious shortcoming for investigation in inequality among ethnic groups in Thailand is the inadequacy of useful data with regard to all aspects of ethnic groups, especially at the national level. There are only a small number of surveys and ethnographic data currently available, and only a few issues have been raised

regarding these groups even though many of them have been granted Thai nationality. There is a need for more regular and comprehensive data collection by ethnicity across a range of administrative and survey data at both local and national levels. At the very least, national surveys and the Survey of Population Change should include questions on ethnicity, or language spoken in a household which was verified by this study that it is reliable to use as a proxy of ethnicity. This would be helpful for all ethnic groups and maximize value and efficacy of such surveys.

5.2.4 The last recommendation relates to the conceptual framework for child mortality researches. This study confirms that the Mosley and Chen framework (1984) can be used to explore an understanding of the linkage between socioeconomic and proximate determinants affecting to child mortality in ethnic minorities in Thailand. However, this analytic framework does not fully fit the study of child mortality in ethnic groups. It is suggested to add the issue of cultural change, acculturation, or assimilation to the conceptual model as these factors have a powerful influence on socioeconomic and proximate determinants among ethnic groups. Living in the midst of the dominant culture, the life styles of minorities and their perceptions tend to be influenced by the mainstream culture, thus the issue of transculture should be considered in ethnic studies.

5.3 Limitations of The study

This study was conducted using data sources from two levels. The findings from the national census indicate child mortality rates during 1986-1996 and socioeconomic status was taken from 2000, while village data gathered in 2006. Therefore, in interpreting the findings is necessary concerning the time discrepancy.

In addition, both ethnic groups selected for detailed investigation in the qualitative approach, have certain aspects different form Karen and Mon in other areas of Thailand. The Karens in this study are Christians which have a different life style from Buddhist Karen. Additionally, most Karens in the study area have not been granted Thai nationality; while almost all of the Karens reported by the 2000 census

have obtained Thai nationality. Mon in Thailand also comprise several groups, old Mon and new Mon; some groups have been living in Thailand for a long period of time and have become Thai citizens. Most Mons in this study are migrants who recently crossed over from Myanmar. These two ethnic groups have specific characteristics, thus it should be emphasize that even the same ethnic group may have variations in many aspects. Therefore, the findings are not necessarily applicable to all Karen and Mon ethnic groups. However, this study can offer a comprehensive explanation of inequality in child mortality among different ethnic groups which has been rarely studied in Thailand.

Lastly, apart from factors contributing to inequality in child mortality investigated in this study, it should be bear in mind that disparity of child mortality among ethnic groups may attribute by genetic factor as different ethnic groups may contain different genes that may lead to different health status and diseases.

BIBIOGRAPHY

Abbasi, K. (1999). The World Bank and world health: changing sides. *BMJ* 1999, 318: 865-869.

Adler, N.E., Boyce, T., Chesney, M., Cohen, S., Folkman, S., Kahn, R.L. & Syme, S.L. (1994). Socioeconomic status and health: The challenge of the gradient. *American Psychologist,* 49(1):15-24.

Adler, N.E. & Newman, K. (2002). Socioeconomic disparities in health: Pathways and policies. *Health Affairs,* 21(2): 60-76.

Aguettant, L. J. (1996). Impact of Population Registration on Hilltribe Development in Thailand. *Asia-Pacific Population Journal*, 11 (4): 47-72.

Ajwani, S. T., Blakely, B., Robson, Tobias, M., & Bonne, M. (2003). *Decades of Disparity: Ethnic Mortality trends in New Zeland 1980-1999*. Wellington: Ministry of Health and University of Otago.

Allotey, P. & Reidpath, D. (2001). Establishing the causes of childhood mortality in Ghana: the `spirit child'. *Social Science & Medicine,* 52: 1007-1012.

Almeida, C. et al. (2001). Methodological concerns and recommendations on policy consequences of the World Health Report 2000. *The Lancet*, 357: 1692-1697.

Alves, D. & Belluzzo, W. (2004). Infant Mortality and Child Health in Brazil. *Economic and Human Biology*, 2: 391-410.

Anderson, N.B. (1995). Behavioral and sociocultural perspectives on ethnicity and health: Introduction to the specific issue. *Health Psychology,* 14(7): 589-591.

Anker M, Black RE, Coldham C, Kalter HD, Quigley MA, Ross D, et al. 1999. *A Standard Verbal Autopsy Method for Investigating Causes of Death in Infants and Children*. (WHO/CDS/CSR/ISR/99.4). Geneva, World Health Organization.

Aphornsuvan, T. (2004). *Origins of Malay Muslim "Separatism" in Southern Thailand*. Asian Research Institute, working paper series no. 32.

Barrett, H. & Brown, A. (1996). Health, hygiene, and maternal education: Evidence from Gambia. *Social Science and Medicine*, 43: 1579-1590.

Benjakul, S. (2004). Equity of Health Care Utilization by the Elderly Population in Thailand during the Periods of the Economic Bubble and after the Economic Crisis: Human Security and Health Policy Options. *Policy and Governance Working Paper Series No. 52*

Berglas, N. & Lim, J.J. (1998). Racial and Ethnic Disparities in Maternal and Child Health. *NCEMCH Policy Brief*. 3: 1- 6.

Breslow, L. (2002). *Encyclopedia of Public Health*. United States, Macmillan Reference.

Bicego, G.T. & Boerma, J.T. (1993). Maternal education and child survival: A comparative study of survey data from 17 countries. *Social Science and Medicin*e, 36: 1207-1227.

Bjorkman, H. (2006). *MDG Plus: A Case Study of Thailand*. Retrieved on 14 April, 2006 from: http://www.undp.or.th

Bollen, K.A., Jenifer L.G. & Stecklov, G. (2001). *Socioeconomic status and class in studies of fertility and health in developing countries.* Annual Review of Sociology.

Bornstein, M. H. & Cote, L. C. (2006). *Acculturation and Parent-Child Relationships: Measurement and Development*. Mahwah, NJ: Lawrence Erlbaum Associates.

Bos, S. G.**,** Bhopal**,** R.**,** Wild**,** S. & Kai, J. (2005). Limitations and potential of country of birth as proxy for ethnic group. *BMJ*, 330.

Bour, D. (2003). Mothers' education and childhood mortality in Ghana. *Health Policy*, 64: 297-309.

Braveman, P.A. & Gruskin, S. (2003). Defining equity in health. *Journal Epidemiology Community Health*, 57: 254-258.

Breslow, L. (Ed.) (2002). *The Encyclopedia of Public Health.* New York, MacMillan Publishing Company.

Brockerhoff, M. & Derose, L.F. (1996). Child Survival in East Africa: The Impact of Preventive Health Care. *World Development*, 24(12): 1841-1857.

Brockerhoff, M. & Hewett, P. (2000). Inequality of child mortality among ethnic groups in sub-Saharan Africa. *Bulletin of the World Health Organization.* 78 (1): 30-41.

Bulatao, A.R. & Anderson, N.B. *Editors*. (2004). "Perspectives on Racial and Ethnic Differences" in *Understanding Racial and Ethnic Differences in Health in Late Life: A Research Agenda.* Washington, DC: the National Academic Press.

Burgard, S. and Treiman, J.D. (2004). Explaining Racial Differences in Child Mortality in South Africa. California Center for Population Research, University of California, Los Angeles. Working Paper Series.

Caldwell, J. *C.* (1982). *Theory of Fertility Decline.* New York, Academic Presses.

Capron, C. & Duyme, M. (1989). Assessment of effects of socioeconomic status on IQ in a full cross-fostering design. *Nature*, 340: 552-553.

Chaturvedi, N. (2001). Ethnicity as an epidemiological determinant crudely racist or crucially important? *International Journal Epidemiology*, 30: 925-927.

Choe, M.K., Diamond, I., Steele, F.A. & Kim, S.K. (1998). "Son preference, family building process and child mortality" in *Too young to die: Genes or Gender?* New York, United Nations publication.

Cleland, J., Bicego, G. & Fegan, G. (1992). Socioeconomic inequalities in childhood mortality: the 1970s to the 1980s. *Health Transition Review*, 2 (1): 1-18.

Crimmins, E.M., Hayward, M.D. & Seeman, T. E. (2004). "Race/Ethnicity, Socioeconomic Status, and Health" in *Critical Perspectives on Racial and Ethnic Differences in Health in Late Life.* Anderson, N. B., Bulatao, R. A. & Cohen, B. *Editors*. National Research council, Washington, D.C., the National Academic Press.

Deaton, A. & Zaidi, S. (2000). *Guidelines for constructing consumption aggregates for welfare analysis*.Washington DC: World Bank.

Deephadung, S. (1996). *Encyclopedia of Ethnic Group in Thailand: Hmong*. Bangkok, Saha Dhammic Press.

Deephadung, S., Ausupharat, P. & Dam Sa-ad, P. (1999). *Encyclopedia of Ethnic Group in Thailand: Mon.* Bangkok, Saha Dhammic Press.

Defo, B.K. (1997). Effects of socioeconomic disadvantage and women's status on women's health in Cameroon. *Social Science and Medicine*, 44: 1023-1042.

Elo, I.T. & Preston, S.H. (1997). 'Racial and Ethnic Differences in Mortality at Older Ages' in Martin, L.G., Soldo, B.J. (eds.). *Racial and Ethnic Differences in the Health of Older Americans*. Washington, D.C., National Academy Press.

Evans, G.W. & Kantrowitz, E. (2002). Socioeconomic status and health: The potential role of environmental risk exposure. *Annual Review of Public Health*, 23:303-331.

Federal Interagency Forum on Child and Family Statistics. 2005. Retrieved on 14 April, 2006 from: http://www.childstats.gov/americaschildren/index.asp.

Ferguson, B.D, Tandon, A., Gakidou, E. & Murray, C.J.L. (2003). *Estimating Permanent Income Using Indicator Variables.* Evidence and Infromation for Policy Cluster, World Health Organization, Geneva.

Feyisetan, B. J., Asa, S. & Ebigbola, J. A. (1997). Mother's management of childhood diseases in Yorybaland: the influence of cultural beliefs. *Health Transition Review*, 7: 221-234.

Fhaumnouyphol, P. (2000). *Mortality Inequality in Thailand 2000: A small area analysis*. Bureau of Policy and Strategy. Bangkok: Ministry of Public Health.

Filmer, D and Pritchett, L. H. (2001). Estimating wealth effects without expenditure data-or tears: an application to educational enrollments in states of India. *Demography*, 38: 115-132.

Foggin, P., Amijo-Hussein, N., Marigaux, C., Zhu, H. & Liu, Z. (2001). Risk Factors and Child Mortality among the Miao in Yunnan, Southwest China. *Social Science and Medicine*, 53: 1683-1969.

Forbes, A. (2004). Discover Thailand's Hill Tribes: Trekking in Northern Thailand. Retrieved on 3 Oct. 2007 from: http://www.cpamedia.com/travel/thailand_hill_tribe_trekking/

Forst, M.B., Haas, D.W. & Forste, R. (2002). *Maternal education and Child nutrition status in Bolivia: Finding the links.* Presented at the Annual meetings of the Population Association of America. Atlanta, Georgia.

Fotso, Jean-Christophe (2006).Child health inequities in developing countries: differences across urban and rural areas. *International Journal for Equity in Health*, 5: 9.

Gakidou, E. & King, G. (2000). *An Individual Approach to Health Inequality: child Survival in 50 Countries*. Retrieved on 10 Dec. 2005 from: http://www. hsph.harvard.edu/ organizations/bdu

Gill, P.S., Kai, J., Bhopal, R.S. & Sarah, W. (2007). *Black and minority ethnic groups*. Retrieved on 11 Feb. 2007 from http://hcna.radcliffe-oxford.com /bemgframe.htm

Goldman, N., Pebley, A. R. & Gragnolati, M. (2002). Choices about treatment for ARI and diarrhea in rural Guatemala. *Social Science and Medicine*, 55: 1693-1712.

Goza, F.W., Stockwell, G. E. & Balistreri, S.K. (2006). *Racial Differences in the Relationship between Infant Mortality and Socioeconomic Status.* Department of Sociology, Bowling Green State University, Ohio, USA.

Gugler, J. (1996). *The urban transformation of the developing world*. Oxford, Oxford University Press

Gwatkin, D.R., Rutstein, S., Johnson, K., Pande, R.P. & Wagstaff, A. (2000). *Socioeconomic Differences in Health, Nutrition, and Population in India*. Washington: The World Bank.

Heaton, T.B., Forste, R., Hoffmann, J.P. & Flake, D. (2005). Cross-national variation in family influences on child health. *Social Science and Medicine*, 60: 97-108.

Highland Economic and Social Development Promotion Office (2001). Retrieved on 30 Nov. 2005 from: http://www.geocities.com/hesdp/index99.html,

Highland Health Development Center (2005). Health Status of Highland Communities. Retrieved on 30 Nov. 2005 from: http://www.anamai. moph.go.th/fphc,

Hill, K. (1995). Age pattern of child mortality in the developing world. *Population Bulletin of the United Nations*, 39: 112-132.

Hill, K.,Vapattanawong, P., Prasartkul, P., Porapakkham, Y., Lim, S. S. & Lopez, D. A. (2006). Epidemiologic transition interrupted: a reassessment of mortality trends in Thailand, 1980-2000. *International Journal of Epidemiology*, doi:10.1093/ije/dy l257. Retrieved on 7 Jan. 2007 from: http://ije.oxfordjournals.org/cgi/reprint/dyl257v1? maxtoshow

Hilltribe Welfare Division. (2005). The Basic Minimum Need Survey. Retrieved on 14 March. 2005 from: http://www.geocities.com/thaihill/

Hong, R., Banta, E.J. & Betancourt, A.J. (2006). Relationship between household wealth inequality and chronic childhood under-nutrition in Bangladesh. *International Journal for Equity in Health*, 5: 15.

Hosseinpoor, R. A., Mohammad, K., Majdzadeh, R., Naghavi, M., Abolhassani, F., Sousa, A., Speybroeck, N., Jamshidi, R. H. & Vega, J. (2005). Socioeconomic inequality in infant mortality in Iran and across its provinces. *Bulletin of World Health Organization.*

Houweling, A. J. T., Kunst, A.E., Borsboom, G. & Mackenbach, J.P. (2006). Mortality inequalities in times of economic growth: time trends in socioeconomic and regional inequalities in under 5 mortality in Indonesia, 1982-1997. *Journal Epidemiology Community Health*, 60: 62-68.

Hubbell, F. A., Chavez, L. R., Mishra, S. I. & Valdez, R. B. (1996). Beliefs about Sexual Behavior and Other Predictors of Papanicolaou Smear Screening among Latinas and Anglo Women. *Archives of Internal Medicine,* 156: 2353–2358.

Hummer, R.A., Rogers, R.G. & Eberstein, I.W. (1998). Sociodemographic Differentials in Adult Mortality: A Review of Analytic approaches. *Population and Development Review*, 24(3): 553-578.

Jensen, A.R. (1998a). Adoption data and two g-related hypotheses. *Intelligence,* 25: 1-6. Retrieved on 27 Jan. 2007 from http://psycprints.ecs.soton.ac.uk/archive/00000106/

Kanchanasinith, K. & Porapakkham, Y. (1988). *The Study of Infant Mortality in Thailand 1988*. Institute for Population and Social Research, Mahidol University: Bangkok, Thailand.

Kasiev, N.K., Sullivan, J., Kudayarov, D.K. & Builashev, T.S. (1998). "Infant and Child Mortality" in Ministry of Health of the Kyrgyz Republic and Macro International Inc., *Kyrgyz Republic Demographic and health Survey 1997*: 93-99.

Kawachi, I., Subramanian, S. V. & Alemida-Filho, N. (2002). A Glossary for health inequalities. *Epidemiology Community Health*, 56: 647-652.

Keeler, G.J. et al. (2002). Assessment of personal and community-level exposures to particulate matter among children with asthmas in Detroit, Michigan, as part of Community Action Against Asthma (CAAA). *Environmental Health Perspectives,* 110:173-181.

Kington, R.S. & Nickens, H.W. (2001). Racial and ethnic differences in health: Recent trends, current patterns, future directions. Pp 253-310 in *National Research Council, America Becoming: Racial Trends and Their Consequences*. Vol. 2, Smelser N., Wilson, W.J., and Mitchell, F., eds. Washington, D.C., National Academy Press.

Kiros, G.E. & Hogan, D.P. (2001). War, famine and excess child mortality in Africa: the role of parental education. *International Journal of Epidemiology*, 30: 447-455.

Kunstadter, P., Kunstadter, L. S., Podhisita, C. & Leepreecha, P. (1993). Demographic Variables in Fetal and Child Mortality: Hmong in Thailand. *Social Science and Medicine*, 36 (9): 1109-1120.

Lim, L. & Gosling, P. (1993). *Economic Growth and Ethnic Relations: The Chinese in Southeast Asia*. Paper of USIP.

Loustaunau, M.O. & Sobo, E.J. (1997). *The cultural context of health, illness, and medicine*. the United States of America, Greenwood Publishing Group.

Mackenbach, P.J. & Kunst, E. A. (1997). Measuring the Magnitude of Socio-economic Inequalityies in Health: an Overview of Available Measures Illustrated with Two Examples from Europe. *Social Science and Medicine,* 44(6): 757-771.

Maglad, N.E.A. (2000). Impact of Public Programmes and Household Income On child Mortality in Rural Sudan. *Eastern Africa Social Science Research Review,* 16 (1): 37-48.

Maitra, P. (2004). Parental bargaining, health inputs and child mortality in India. *Journal of Health Economics*, 23: 259-291.

Manda, S.O.M. (1999). Birth intervals, breastfeeding and determinants of childhood mortality in Malawi. *Social Science and Medicine*, 48: 301-312.

Maxwell, A. E., Bastani, R. & Warda, U. S. (1998). Mammography Utilization and Related Attitudes among Korean-American Women. *Women and Health,* 27: 89–107.

McElroy, A. & Townsend, P.K. (1996). *Medical Anthropology in Ecoolgical perspective*. the United State of America, Westveiw Press.

Meekusol, P. (1990). *Ethnographic and Historical Study of Moon River: Kuyl, Khmer, and Lao*. Bangkok, San Mual Chon Press.

Mendoza, M. O. & Kalsbeek, D. W. (198). A Comparison of Alternative Variance Estimators in Demographic Surveys. Proceedings of the Section on Survey Research Methods. American Statistical Association: 332-336

Ministry of Labour and Social Welfare (2005). *Hilltribe population in Thailand*. Retrived on 30 Sept. 2005 from http://www.goecities.com/hesdp/index99.html

Minujin, A. & Delamonica, E. (2001). "*Chapter 3: Child mortality differentials by income group" in Harnessing Globalization for Children: a Report to UNICEF*. edited by Giovanni Andrea, Cornia meeting held at UNICEF-IRC, Florence, on 23-25 April 2001.

Moawad, D. (2005). *Southernmost Thailand Violence: Illiteracy, Poverty, Politics, Illicit Drugs Trafficking, Smuggling and Nationalist Separatists- not Religions and Cultures-the Issue.* France, the United Nations Educational scientific and Cultural Organization: 308-346.

Montgomery, M.R., Gragnolati, M., Burke, K.A. & Paredes, E. (2000). Measuring living standards with proxy variables. *Demography*, 37: 155-174.

Mosley, W.H. & Chen, L.C. (1984). An analytical framework for the study of child survival in developing countries, *Population and Development Review,* 10: 25-45.

Murray, C. J., Gakidou, E.E., & Frenk, J. (1999). Health inequalities and social group differences: what should we measure? *Bulletin of the World Health Organization*, 77 (7): 537-543.

Mwageni, E. et al. (2005). "Socio-economic Status and Health Inequalities in Rural Tanzania: Evidence from the Rufiji Demographic Surveillance System" in Measuring Health Equity in Small Areas: Findings from Demographic Surveillance Systems, Grate Britain, INDEPTH Network.

Nathan, R. et al. (2005). "Child Health Inequity in Rural Tanzania: Can the National Millenimu Development Goals Include the Poorest?" in Measuring Health Equity in Small Areas: Findings from Demographic Surveillance Systems. Grate Britain: INDEPTH Network.

National Social and Economic Development Board. (2002). Thailand's Economic Situation in 2001 and Economic Outlook in 2002. March 2002.

National Statistical Office (2003). Development of Social Indicators at Provincial Level in Thailand. Ministry of Information and Communication Technology: Concluding Workshop RETA 6007: Enhancing Social and Gender Statistics 24-27 June 2003 Bangkok, Thailand.

Nazroo, J.Y. & Karlsen, S. (2001). *Ethnic inequalities in health: social class, racism and identity*. Health Variations Program, Issue 10. Retrieved on 14 April, 2006 from: http://www.lancs.ac.uk/fss/ apsocsci/hub/pdf.

Neaton, J.D., Lewis, H.K., Wentworth, D. & Nemat, O.B. (1984). Total and cardiovascular mortality in relation to cigarette smoking, serum cholesterol concentration, and diastolic blood pressure among black and white males followed up for five years. *American Heart Journal*. 108:759-769.

Nepomnyaschy, L. (2006). *Socioeconomic Gradients in Early Child Health across Race, Ethnicity and Nativity.* University of Michigan, Working papers

Oakes, J.M. & Rossi, P.H. (2003). The measurement of SES in health research: Current practice and steps toward a new approach. *Social Science and Medicine*, 56: 769-784.

Obeng, S. & Gyimah, M. (2002). *Fertility Response to childhood morality in sub-Saharan with emphasis on Ghana and Kenya*. Discussion paper No. 02-02. Retrieved on 22 March, 2006 from: http://sociology.uwo.ca/sociology/ popstudies/dp/dp02-02.pdf.

Ojanuuja, D.N. & Gilbert, C. (1992). Women's access to health care in developing countries. *Social Science and Medicine*, 35(4): 613-617.

Pamuk E.R. (2000). Social-class inequality in infant mortality in England and Wales from 1921 to 1980. *Bulletin World Health Organization*, 78(10): 1256-1270.

Pandey, R.N. (1997). Levels and patterns of Infant and Child Mortality in Mongolia. *Asia-Pacific Population Journal*, 12 (3): 49-64.

Phagaphasvivat, S. (2003). *Entrepreneurship in Thailand*. A compendium report: Entrepreneurship in Asia, The Mansfield Foundation and The Global Forum of Japan.

Phon- ngam, P. (1995). *Encyclopedia of Ethnic Group in Thailand: Khmer*. Bangkok, Saha Dhammic Press.

Podhisita, C., Kunstadter, P. & Kunstadter, S. L. (1990). Evidence for early fertility transition among the Hmong in northern Thailand. *Journal of Population and Social Studies*, 2: 137-156.

Population, Family and Children [Nepal], and ORC Macro (2003). *Vietnam Demographic and Health Survey 2002*. Calverton, Maryland, USA: Family Health Division, Ministry of Health, New ERA and ORC Macro.

Population, Family and Children [Vietnam], and ORC Macro (2003). *Vietnam Demographic and Health Survey 2002*. Calverton, Maryland, USA: Family Health Division, Ministry of Health, New ERA and ORC Macro.

Pramsrirat, S. et al. (2002). *Ethno linguistic Maps of Thailand*. Institute of Language and Culture for Rural Development, Mahidol University.

Ratanakul, S. & Burutpat, S. (1995). *Encyclopedia of Ethnic Group in Thailand: Sgaw Karen*. Bangkok, Saha Dhammic Press.

Rukumnuaykit, P. (2006). Mortality and Causes of Death in Thai land: Evidence from the Survey of Population Change and Death Registration. *Asia-Pacific Population Journal*, 2: 67-84.

Rutstein, S.O. (2000). Factors associated with trends in infant and child mortality in developing countries during the 1990s. *Bulletin of the World Health Organization*, 78(10): 1256-1270.

Salaya, T. (1994). *The Ancient State*. Bangkok, Dan Suta Press.

Sangelek, N. (2002). *Model of Community Participation for Safe Motherhood in Hilltribe Population*. Bangkok: Highland Health Development Centre, Ministry of Public Health.

Sarker, J.N. & Saha, S.C. (1998). *Determinants of Infant and Child Mortality in Rural Bangladesh*. International Centre for Diarrhoeal Disease Research, Dhaka, Bangladesh.

Sasiwongsaroj, K. (1998). *Health Care Behavior of Burmese Migrant Mothers when the Children under-five years got diarrheal disease: the Study in Congested Burmese Community, Ranong Province*. Master of Arts, Graduated Studies, Mahidol University.

Sastry, N. (2004). Trends in Socioeconomic Inequalities in Under-Five Mortality: Evidence from Sao Paulo, Brazil, 1970-1991. *Demography*, 41 (3): 443-464.

Schrock, L.J. et al. (1970). *Ethnographic Study Series: Minority Groups in Thailand*. Washington. D.C., Department of the Army. United States Government Printing Office.

Schulpen, T. W. J., Van Steenbergen, E. J. & Van Driel, F. H. (2001). Influences of ethnicity on perinatal and child mortality in the Netherlands. *Journal Epidemiology Community Health*, 84: 222-226.

Senah, K. (1993). *Socio-cultural aspects of child morbidity and mortality in the Kassena Nankana District.* Legon: Department of Sociology, University of Ghana.

Shaw, C., Blakely, T., Atkinson, J., & Crampton, P. (2005). Do social and economic reforms change socioeconomic inequalities in child mortality? A case study: New Zealand 1981–1999. *Journal Epidemiology Community Health*,59: 638–644.

Sherbinin, AD. (2004). *The Geographical and Biophysical Correlates of Hunger and Infant Mortality: Lessons from CIESIN's Poverty Mapping Activities*. AGU Annual Meeting, San Francisco, CA, 14 December 2004.

Sirisai, S. (1996). *Encyclopedia of Ethnic Group in Thailand: Lahu.* Bangkok, Saha Dhammic Press.

Smith, J. P. & Kington, S.R. (1997). "*Race, Socioeconomic Status, and Health in Late Life" in Racial and Ethnic Differences in the Health of Older Americans*, Linda, G. M. and Beth J. S. Editors. Washington, DC: The National Academies Press.

The National Institute of Health (2004). *Public Health Research by Topic*. The University of Adelaide. Retrieved on 11 Sept. 2005 from: http://www.library.adelaide.edu.au/guide/med/ pubhealth/ethnic.html

Tribal Research Institute (1998). *Hilltribes in Thailand*. Chiang Mai, Thailand, Department of Public Welfare, Ministry of labor and Social Welfare.

UNICEF (2005). *A Region Where Every Child Counts 7th East Asia and Pacific*. Ministerial Consultation on Children 23-25th March 2005, Key Regional Facts on Health.

UNICEF (2006). *Under-five mortality rate.* Retrieved on 3 April, 2007 from: http://www.childinfo.org/areas/childmortality/u5data.php

UNICEF (2007). *The State of the World's Children 2007*. Retrieved on 18 July, 2007 from: http://www.childinfo.org

United Nations (1983). Indirect Techniques for Demographic Estimation. *Manual X*. New York: United Nations.

United Nations (2005). *The Millennium Development Goals Report*. New York.

Vapattanawong, P., Hogan, C. M., Hanvoravongchai, P., Gakidou, E., Vos, T., Lopez, D. A. & Lim, S. S. (2007). Reductions in child mortality levels and inequalities in Thailand: analysis of two censuses. *Lancet*, 369: 850-855.

Wagstaff, A. (2000). Socioeconomic inequalities in child mortality: comparisons across nine developing countries. *Bulletin World Health Organization*, 78 (1): 19-29.

Wang L., Hughes, G. & Fan, X. (2002). *Determinants of child mortality and morbidity: Findings from the China National Health Survey*. Working paper, Environment an Economic Policy Department, The World Bank.

Wang, L. (2003). Determinant of child mortality in LDCs: Empirical finding from Demographic and Health Survey. *Health Policy*, 65: 277-299.

Warr, G. P. (2000). Is growth good for the poor? Thailand's boom and bust. *International Journal of Social Economics*, 27: 862-877.

Wethers, L. D. (2000). Sickle Cell Disease in Childhood: Part1 Laboratory Diagnosis, Pathophysiology and health Maintenance. *American Family Physicial*, 65 (5): 64-71.

Whitehead, M., Scott-Samuel, A., & Dahlgren, G. (1998). Setting targets to address inequalities in health. *The Lancet*, 351: 1279-1282.

Whitworth A. & Stephenson, R. (2002). Birth Spacing, Sibling Rivalry and Child Mortality in India. *Social Science and Medicine*, 55: 2107-19.

Wibulpolprasert, S. (Ed.) (2002). *Thailand Health Profile 1999- 2000*. Nonthaburi, Thailand: Burea of Policy and Strategy, Ministry of Public Health.

Widayatun, J. (1991). Women's Status and Child Survival in West Java, Indonesia. *Asia-Pacific Population Journal*, 6(1).

Wild, S. & Mckeigue, P. (1997). Cross sectional analysis of mortality by country of birth in England and Wales, 1970-92. *BMJ* , 314: 705.

Williams, D. R. & Collins, C. (1995). US Socioeconomic and Racial Differences in Health: Patterns and Explanations. *Annual Review of Sociology*, 21: 349- 386.

Williams, D.R., Neighbors, H.W. & Jackson, J.S. (2003). Racial/ethnic discrimination and health: Findings from community studies. *American Journal of Public Health*, 93(2): 200-208.

Williams, J.L. & McCarthy, B. (2005). Observations from a Maternal and Infant Hospital in Kabul, Afghanistan-2003. *Journal of Midwifery & Women's Health*, 50 (4): 31-35.

Wilmoth, J.R. & Dennis, M. (2000). *Social Differences in Older Adult Mortality in the United States: Questions, Data, Methods, and Results.* University of California,

World Health Organization (2000). *World health report 2000*. Geneva: World Health Organization: 205.

Young, G. (1962). *The Hill Tribes of Northern Thailand.* Bangkok: Siam Society.

Yusuf, F. & Byrnes, M. (1994). Ethnic Mosaic of Modern China: An Analysis of Fertility and Mortality Data for Twelve Largest Ethnic Minorities. *Asia-Pacific Population Journal*. 9 (2): 25-46.

Zere, E. & McIntyre, D. (2003). Inequities in under-five child malnutrition in South Africa. *International Journal for Equity in Health*, 2: 7.

BIOGRAPHY

NAME: Miss Kwanchit Sasiwongsaroj

DATE OF BIRTH July 23, 1965

PLACE OF BIRTH: Ranong Province, Thailand

INSTITUTIONS ATTENDED: Boromarajonani Collage of Nursing Bangkok, 1984-1988
Bachelor of Science in Nursing

Institute for Language and Culture for Rural Development, Mahidol University, 1996-1998
M.A. (Cultural Studies: Culture in Public Health)

Institute of Population and Social Research, Mahidol University, 2002-2007
Ph.D. (Demography)

SCHOLARSHIP: Lecture Development Scholarship, Mahidol University

Wellcome Trust, London, UK

HOME ADDRESS: 7/6 Moo 1, Bang Rin Sub-district, Moung District, Ranong Province

EMPLOYMENT ADDRESS: Institute for Language and Culture for Rural Development, Mahidol University, Thailand
Tel: 02 800 2308 Fax: 02 800 2332