THE IMPACT OF PARENTAL MIGRATION ON THE HEALTH OF CHILDREN LIVING SEPARATELY FROM PARENTS

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ABSTRACT

While the number of parents migrating to seek jobs elsewhere leaving young children in the care of others has been common, little is known about the positive or negative consequences for children. This study uses both bivariate and multivariate analyses to examine the impact of parental out-migration on the health of children left behind. Data were derived from two research projects: the "Child Health and Migrant Parents in South-East Asia (CHAMPSEA), Thailand 2008", and "Migration and Health, Kanchanaburi Demographic Surveillance System (KDSS), 2007". A total of 11,241 children in the KDSS Survey, and 1,027 children in the CHAMPSEA project, were the study population for this thesis.

The study found that 14.5% of children had either one or both migrant parents in the Kanchanaburi study area. The percentage of the study children with physical health problems (incidence of illness) range from 25% to 53%, and more than a tenth of the children (13%) had poor psychological well-being. Several individual, household, and community factors were significantly associated with children's health. Multivariate analysis suggests that parental internal out-migration is independently associated with a higher likelihood of an illness (OR=1.15). For international migration of parents, no significant association was observed between current parental international migration and the health status of children living apart from parents. On the other hand, mothers' past migration experience is associated with poor psychological well-being (OR=2.04) and physical health (being overweight, OR=2.59) of children. This implies that parental out-migration and mothers' past migration experience since the child was born can actually have an impact on children's lives. This study could be the benchmark for policy makers and program planners to improve health services in Thailand for migrant families. The findings also suggest that strategies to alleviate the negative impact of parental migration as well as to maintain and enhance the well-being of families, especially among the children left behind, are warranted.

KEY WORDS: PARENTAL MIGRATION/CHILDREN LIVING SEPARATELY/ CHILD HEALTH

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CHAPTER I
INTRODUCTION

This chapter presents the background of the study including problem statement and justification of the study. The chapter also discusses research questions, and objectives of the study. Finally, it presents the organization of the dissertation.

1.1 Problem statement and justification of the study

The relationship between migration and health is complex and dynamic. Migration has an impact on physical, mental, and emotional health and well-being of migrants themselves, people in place of origin (left behind), and people in the place of destination (Carballo et al., 1998). The connection between health status and migration is bidirectional. In one direction, the act of migration may influence health outcomes. In the other direction, a person's health may influence whether to migrate to the place of destination or not (White, 2009).

Literatures show that parental migration has both positive and negative impact on children living separately from parents. On one hand, migration could benefit both migrants and left-behind members as it can enhance the well-being of migrants as well as that of their families (Chant & Radcliffe, 1992; Kahn et al., 2003; Oded, 1991). Migration leads to better health among the population left behind (Gulati, 1993; Hadi,1999; Kuhn, 2003). Children of migrant parents are heavier and taller than the children of non-migrants and are less anxious and less lonely compared with the children of non-migrants (SMC, 2005). Most of the existing research focused on the importance of remittance and found that remittances received from migration could support the family left behind by minimizing economic risk and overcoming capital constraint (Massey, 1990; Stark & Taylor, 1991). Remittances increase access to healthcare services, especially in poor household where remittances represent a primary source of income for family left behind (Cortes, 2007; Salah, 2008). Bryant

reviewed many studies and found that children of migrant parents have better health than those of children in non-migrant households due to the use of remittances on children's education, and health (Bryant, 2005). With additional money coming from remittances, left-behind families can eat more nutritious food and buy expensive medicine, if required (Salah, 2008). Although studies show that left-behind family members benefit from increases in family income spent on improved nutrition, housing, access to health care, and schooling (Hadi, 1999; Jones and Kittisuksathit, 2003), some studies found that the strategy is not always successful and debts incurred to facilitate migration or the paucity of remittances may result in left-behind family members having less money than before (Smith-Estelle & Gruskin, 2003).

On the other hand, many literatures show negative impacts of parental migration on physical and mental health/psychological well-being of children. It is argued by the attachment theorists that migratory separation during infancy or early childhood places a child at risk for poor long-term psychological adjustment because of the disruption of the parent-child bond (Ainsworth, 1989). Children of absent parents do not receive care and medicine on time and the food they have access to is of low quality (Salah, 2008). Parental migration is a risk factor for unhealthy behaviors such as smoking tobacco and alcohol consumption. Left-behind children also seem to have a higher vulnerability to the spread of HIV/AIDS, a higher rate of drug use, and heroin addiction (Battistella & Conaco, 1998).

Furthermore, study found that left-behind girls were more likely to be unhappy, to have suicidal ideation, and to consider leaving home (Gao et al., 2010). Studies also revealed that left-behind children are more vulnerable to psychological problems such as depression (Gao et al., 2010; Jones et al., 2004; Pottinger, 2005), loneliness, anxiety, and wariness (Gao et al, 2007; Huang et al, 2005; Wang et al, 2006; Zhang et al, 2007 cited in Gao et al., 2010). Moreover, the separation from parent(s) may cause negative impact on psychosocial development (Aguilera-Guzman et al., 2004; Save the Children Sri Lanka, 2006), psychological damage, and poor self-esteem (Jones et al., 2004; Pottinger, 2005). A higher incidence of mental disorders, and impeded social and psychological development were also documented among left-behind children (Hugo, 2002). When parents migrate, left behind children are cared for by other family members such as grandparents or other relatives. A study

conducted in Thailand found that children reared by grandparents had higher chance of having below normal development than those reared by parents (Nanthamongkolchai et al, 2011). The differences in family role, education level, and lifestyle between parents and other caretakers may contribute to an unfavorable environment for psychological development for children, so the consequence of parental migration can be negative. However, study also found that if the left-behind child of migrant mother is cared for by grandparents, the child-care arrangement remains the same (Richter, 1996).

On the positive side of parental migration, money or remittances received from parents is seen as an explanation through which left-behind children benefit. However, money can also be perceived as a supporting factor for unhealthy behavior. Some studies found that children of migrant parents are being exposed to harmful consequences such as alcoholism, drug, and sexual abuse due to the availability of money, peer pressure, and inadequate supervision or under-protected situation (Crawford-Brown & Rattray, 2002; Salah, 2008).

Migration of one or both parents and their gender (mother or father) may affect their children's social behavior and health status in a different way. Previous study suggested that migration is not necessarily disruptive for the children left behind if it is not the mother who migrates (Battistella & Conaco, 1998). The children of migrant mothers are found to feel lonely, angry, unloved, afraid, and worried compared with children of non-migrants (SMC, 2005). Study also found that a mother's out migration is positively associated with child morbidity (Phuc et al., 2009) and mortality (Konseiga et al., 2009).

In Thailand, Bangkok and its surrounding area have emerged as the major destination for migrants in the entire Greater Mekong Sub-region and for internal migrants from other provinces as well. The National Migration Survey, conducted in 1992, found that 22 per cent of the population had moved elsewhere for one month or more in the past five years (Chamratrithirong et al., 1995). The prevalence of rural to urban migration was more than double during the period between 1975-1980 and 1985-1990 (Anh, 2003; Guest, 2003) in Bangkok when the service sector was greatly expanding in Bangkok. Internal migration, especially from the Northeastern and Northern regions to Bangkok and the Central region, has supported economic growth

of the country by providing labors for construction, manufacturing and services, and by generating remittances to the regions of out-migration. An anthropological study of a village in Thailand (Lauro, 1979 cited in Chamratrithirong, 2007), and a comprehensive follow-up study (Chamratrithirong, 2007) of out migrants from that area to Bangkok and to a rural frontier province (Chamratrithirong, 1983) showed that the villagers were responsive to economic opportunities. This study also found that migration in the community was found to be innovating, rational, and economic in nature (Chamratrithirong, 2007).

A recent report on migration in Thailand indicates that about 20 per cent of Thai children are not living with their parents, largely because of significant levels of internal migration, and little is known about the consequences for the children who are left behind (Huguet & Chamratrithirong, 2011). Recently, several studies have been conducted to examine the impact of parental migration on children left behind, among others, Jampaklay (2006), Jones & Kittisuksathit (2003), and Nanthamongkolchai et al., (2006). These studies have given a mixed picture of the consequences for children, having found both positive and negative results (Jampaklay, 2011). My study aims to contribute to this literature by examining the impact of parental migration on the physical and psychological well-being of children left behind. Results of this study can be useful for policy makers and program planners to improve health services in Thailand for migrant families. Study findings can also be beneficial for governmental or non-governmental organizations and children's right activists as they design and advocate appropriate interventions related to migration in Thailand.

1.2 Research questions

The relationship between migration and health is bidirectional, and it has impact on physical, mental and emotional health, and well-being of migrants themselves, people in place of origin (left behind), and people in the place of destination. However, due to the availability of data, this study looks at one direction only, which is from migration to physical health and psychological well-being of people in place of origin (children left behind).

This study explores the answer to the following research questions:

1. Does parental migration (internal and international) have an association with the physical health of children left behind?

2. Does parental migration (international) have a relationship with psychological well-being of children left behind?

1.3 Objectives

The study aims to explore the impact of parental migration on the health of children left behind in Thailand.

The specific objectives of the study are:

1. To examine the impact of parental migration (internal and international) on the physical health of children left behind.

2. To examine the impact of parental migration (international) on the psychological well-being of children left behind.

1.4 Organization of the dissertation

This dissertation is presented in six chapters. The present chapter (Chapter 1) is the introduction chapter of this dissertation. Literature review is presented in Chapter 2. Chapter 3 describes the methodology of this study. Results from internal migration are presented in Chapter 4. In chapter 5, results from international migration are presented whereas Chapter 6, the last chapter, presents the discussion and conclusion of the findings.

CHAPTER II
LITERATURE REVIEW

In this Chapter, selected literatures relevant to the current study are presented. The review begins with theoretical overview on migration. Then, discussion on related empirical evidence with regards to the impact of parental migration on the health of children left behind is provided. This chapter also briefly explains internal and international migration situation of Thailand. Finally, conceptual frameworks drawn from the world literature in general and from Thai literature and data in particular, are presented.

2.1 Theoretical overview

To conceptually understand impact of parental migration on children left behind, we need to comprehend impact of migration on household, community, and development. A substantial body of theory focuses on impact of migration on household, community, and national development. *Human capital model* (Sjaastad, 1962) views migration as a path of maximizing returns to human capital. Individuals migrate to place of destination with the expectation of being better off in future because it considers migration as an investment. *Individual cost and benefit model* is another most widely-used approach to the study of human population. This model views migration as the outcome of a rational evaluation of the costs and benefits of movement. This model is closely associated to human capital model (Becker, 1975), and was given its classic form by Todaro (Harris & Todaro, 1970; Todaro, 1969). Harris and Todaro (1970) examined the determinants of internal migration flows, assuming that migration decision was made by rational, well informed individuals seeking utility maximization. Todaro explained that the movement of people is basically due to the wage differentials between receiving and sending areas (Todaro, 1969). According to Todaro, migration may be conceptualized as an investment in

human productivity, which includes all forms of investment and has costs and returns. Rational actors anticipate in the migration decision process such as whether to migrate or where to migrate. Cost-benefit models posit a single actor making decisions in a social and economic vacuum without institutions, traditions, history, or community.

Human capital theorists have strongly been criticized by scholars using *structuralisms approach*. Structuralists view transformations of social and economic institutions and mobilize labor for reasons beyond individual utility maximization (Morawska, 1990; Portes & Walton, 1981). Structuralism approach argues that international migration reflects the exploitative political economic relationship between sending and receiving societies (Goss & Lindquist, 1995). Social stratification, globalization, wage differential and the mechanization of labor in sending countries create structural imbalances that generate international migration (Portes & Walton, 1981) which can produce further inequalities in human capital deficit and underdevelopment in sending areas (Goss & Lindquist, 1995).

Although there is still scarcity of empirical studies dealing with the left-behind people, *the New Economics of Labour Migration (NELM)* has contributed to the understanding of the situation of left-behind people. This theory argues that migration decisions are not made by isolated individual actors (Massey et al., 1993) but group of related people. For instance, families decide to send one or more members abroad to maximize their expected overall income or to minimize the risks associated with a variety of market failures (Massey, 1990; Stark & Bloom, 1985; Stark & Taylor, 1991; Taylor, 1999). The New Economics of labor migration posits that *altruism* and *self-interest* are two important determinants of remittances sending back to countries of origin. Altruism remittances behavior is thought to be motivated by the caring sentiments of the migrant family members for those left behind. Self-interested remittances behavior reflects aspiration and expectation more so than sentiment as the migrant family member remits to illustrate intentions and earn future rewards such as inheritance (Stark & Lucas, 1988).

NELM is one of the main contributor to the academic, and policy debate on the links between migration and development (Cortes, 2007). Its analyses focus on the household, although subsuming children, and women under the model of unified household in the migration process. Households were seen as the principal agents in

the migration process, which in turn was viewed as part of the strategies of economic development (Massey, 1990; Stark & Bloom, 1985; Stark & Taylor, 1991; Taylor, 1999).

In rural areas of most of the developing countries, internal and international migration has become key components of household economic strategies (Grindle, 1988). Migration cost which include monetary cost of making the trip such as transport, lodging, etc; information and search cost such as time, money, and effort required to identify possible jobs and obtain them; opportunity costs (income forgone while travelling and searching for work), and psychic cost (the psychological toll of leaving a familiar environment and moving to a strange setting) will increase with distance and rise substantially when an international border is crossed (Stark, 1984) and reduced network in place of destination (Cornelius, 1975; Lomnitz, 1977; Massey, 1987).

Household economic strategies focus not only to maximize household earnings but also to minimize the risk. The reduction in risk requires the work in place of destination to be relatively uncorrelated or better, inversely correlated with earnings at place of origin (Katz & Stark, 1986; Stark, 1984; Stark & Levhari, 1982). The strategy of risk diversification assumes that households are free to send members outside the community on a temporary basis. In such situation migrant send remittances to the family whether they are internal migrants (Lucas & Stark, 1985) or international migrants (Massey & Espana, 1987). A study in Latin American-Caribbean countries found a larger effect of male over female migrant remittances behavior from countries of origin with more traditional patriarchal norms such as Mexico. This reflects basic assumption about patriarchal norms regarding family cohesiveness, remittances' sending behaviors and male migration as a planned provider strategy which could be seen to draw on tempered altruistic perspective of NELM as migrant father fulfills household, and social, contractual agreements (Sana & Massey, 2005).

The concern of NELM regarding impact of migration is mainly centered on income changes, and their consequences on left-behind houses. This theory expects positive impact of migration on family left behind. The scholars of this theory opined that migration helps to improve both household and country income leading to the

development and elimination of disparities. Most of the research also identified the importance of remittances to support the family left behind by minimizing economic risk and overcoming capital constraint (Massey et al., 1994; Stark & Taylor, 1991). With additional money coming from remittances, left-behind families can buy necessary medicine, eat more nutritious food (Salah, 2008), and increase access to healthcare services especially in poor household where remittances represent a primary source of income for family left behind (Cortes, 2007; Salah, 2008). Although a study found that left-behinds benefit from increases in family income spent on improved nutrition, housing, access to health care, and schooling (Hadi, 1999; Jones and Kittisuksathit, 2003), the strategy is not always successful. Debts incurred to facilitate migration or the paucity of remittances may result in left- behind family members having less money than before (Smith-Estelle & Gruskin, 2003).

2.2 The impact of parental migration on the health of children left behind

Internal and international migration is rarely considered together. However, internal and international migration have many things in common including causes, the processes involved, and their impact and outcomes (DeWind & Holdaway, 2005). As mentioned in the previous chapter (introduction chapter), parental internal or international migration may affect the physical, and psychological well-being of left-behind children positively or negatively. Few studies also show that there is no relationship between parental migration and health of children left behind. This section reviews literatures related to parental both internal and international migration's impact on the health and wellbeing on children left behind.

2.2.1 The impact of parental migration on the physical health of children left behind

Some studies show that parental internal and international migration has positive impact on the physical health of children left behind. A study conducted among rural households in Pakistan suggests that internal out migration has a positive impact on the weight, and height of girls. For instance, young girls in migrant households are taller, and weigh better than girls of the same age in non-migrant households (Mansuri, 2007).

With regard to positive impact of international migration on the physical health, a study conducted in Philippines found that children of oversees migrant parents are heavier, and taller than the children of non-migrants. This study also found that children of non-migrants fall sick more frequently, although there was a slightly higher proportion of mothers-away children who are more susceptible to common diseases, and loss of appetite (SMC, 2005). Similarly, a study conducted on Mexican migration to the United States revealed that migration had positive effects on the child's health outcomes, lowering infant mortality, and increasing birth weights (McKenzie, 2006). The positive effect of parental internal and international migration could be due to that when parent migrates, the left behind family may get support from extended family members. It could also be that remittances sent by migrant parents contribute to greater affluence and higher standards of living which can help to mitigate the negative consequences.

However, some other studies show that parental internal and international migration has negative impact on physical health of children left behind. For instance, a study conducted with 3,019 school students in rural china to see the effect of internal migration on child health found that annual injury rate among left-behind children was more than twice that of children living with both parents (253/1000 vs. 120/1000). This study also found that left-behind male children had the highest annual injury rate (316/1000) (Shen et al., 2009). Furthermore, a study conducted in northern Vietnam showed that children under five years of age who have had out migrating mothers have higher risk of morbidity than children whose mother did not out-migrate (Phuc et al., 2009).

Similarly, a study in Mexico by McKenzie (2006) found that children in migrant households are less likely to receive preventive health care which can have long term negative impacts on health outcomes due to parental absence. However, this study did not provide explanation of lower utilization of the health services among children of migrants.

In Thailand, it is notable that a study conducted with 558 school-aged children found that there was no relationship between family member's migration status and child's sickness in the last 6 months prior to the survey (Nanthamongkolchai et al., 2006). However, this study did not directly focus on parents' migration but the author measured whether or not a household member's migration status affects health status of children. Furthermore, using school-based sampling instead of household sampling is potentially risky in neglecting the views of children who are not in school due to migration related reasons.

2.2.2 The impact of parental migration on the psychological well-being of children left behind

It is notable that very few studies show the positive impact of parental internal or international migration on the psychological wellbeing of the children. A study in Philippines demonstrated that children of oversees migrants parents are less anxious and less lonely compared with the children of non-migrants (SMC, 2005). It could be due to that Migrant Filipino mothers continue to maintain close contact with their children, and take charge of providing funds, and arranging for others to raise their children *(Parreñas, 2005).*

Previous research suggests that regular communication between migrant parents and their children lowers the levels of anxieties, and loneliness (Asis, 2006). Migrant parents now use cell phones, internet, and text messages to communicate with their children and the children's caregivers. Yet, children of both parents away usually reported that they were unhappy (Yeoh & Lam, 2007). Study also showed that parents limited themselves to giving instructions concerning the uses of remittance. Fathers who migrate out of country often have little contact with their households and lose their sense of obligation towards their children. In such situation, absence of a father often makes children vulnerable to psychological health (D'Aubeterre, 2000).

On the other hand, a substantial body of research has identified that parental internal and oversees migration has negative impact on psycho-social wellbeing of children. A large number of studies that analyzed the impact of parental internal migration on children's psycho-social wellbeing were found in China. A study with left-behind and non-left behind children found that left-behind children in rural area were more likely to suffer from loneliness (Jia & Tian, 2010). Similarly, another study conducted in Shandong province of China found that mean pediatric quality of life inventory (PedsQL) were lower in the left-behind children than the non-left behind children as were psychosocial summary, emotional functioning, social functioning score (Jia et al., 2010). Likewise, another study by Liu and others found that children who were separated from parents at a younger age had more symptoms of anxiety, and depression. It is also found that these symptoms were more pronounced for children who were separated from their mothers or from both parents (Liu et al., 2009). Furthermore, another study conducted in China that used strength and difficulties questionnaire found that left behind children had significantly more psychopathology, and less pro-social behaviors than the non-left behind children. This study also found that long duration and being left behind at a younger age were significantly associated with more psychopathology (Fan et al., 2010).

Study conducted in China showed that left-behind girls are more likely to be unhappy, to contemplate suicide, and consider leaving home (Gao et al., 2010). Studies also revealed that left behind children are more vulnerable to psychological problems such as depression (Gao et al., 2010; Jones et al., 2004; Pottinger, 2005), loneliness, anxiety, and wariness (Gao et al, 2007; Huang et al, 2005; Wang et al, 2006; Zhang et al, 2007 cited in Gao et al., 2010). Similarly, a study conducted in Hunan of China found higher prevalence of the early child problems behavior among children of migrant parents (Feng et al., 2011). Moreover, the separation from a parent(s) may cause negative impact on psychosocial development (Aguilera-Guzman et al., 2004; Save the Children Sri Lanka, 2006) such as psychological damage, and poor self-esteem (Jones et al., 2004; Pottinger, 2005). A higher incidence of mental disorders, and impeded social and psychological development are also documented among left behind children (Hugo, 2002).

A study conducted to examine the impact of international migration in Moldova showed that although children left behind have more pocket money than their peers which they spend in bars, and for buying expensive goods such as fancy clothes, electronic devices, and computers. However, these children are also at risk of being placed in residential care institutions, and thus being deprived of any form of family care. This study also found that children who were less than five years and left behind by a migrant mother or both parents faced the highest risk of missing out on their early childhood development. Almost all of the children in this study reported that they faced psychological problem after the departure of their parents (Salah, 2008).

Another study conducted in Jamaica by Pottinger (2005) on children in a case-control sample of 9 to 10 years old found that children's reactions to their parents' migration were directly related to poor school performance and psychological difficulties (Pottinger, 2005) . Similarly, a study conducted in Sri-Lanka among 1,200 households with international migrant parents absent for more than six months found that children of migrant mothers performed worse in education than the children of non-migrant mothers. The researchers suggested these outcomes due to the impact of mothers' absence on children's psychological wellbeing (Save the Children Sri Lanka, 2006). Study conducted in Ecuador with 15 different families and household survey of 45 randomly chosen households in four villages found that mothers frequently remark that their children suffered from nervous symptoms such as fear, illness etc. after their fathers departure to another country (Pribilsky, 2001). However, this study collected information only from father-migrant households so it is not possible to compare with non-migrants children.

In Thailand, the study by Jones and Kittisuksathit (2003) compared outcomes for migrants and non-migrants using the focus groups and a survey research tools among 719 rural households in an area of northeast Thailand with extensive international migration. The sample included households that had never sent a member overseas, that currently had a member overseas, and that had a member who had returned from overseas. This study found that there was little or no evidence that children left behind by migrant parents experienced a higher incidence of social problems (Jones & Kittisuksathit, 2003). However, a study conducted by

Nanthamongkolchai and others (2006) with school-age children found that children from parental migrant households are more likely to have low IQ than the children of those who do not have migrant parent(s) in their house (Nanthamongkolchai et al., 2006). It is notable that in the past, almost none of the study in Thailand focused on this issue. However, some studies have linked their study findings with parents' migration status. For instance, 1994 Family and Youth Survey result suggests that having both parents in the household while growing up does reduce the probability that an adolescent aged 15-19 will smoke, drink alcohol, or have premarital sex (Choe et al., 2004).

Recently, some ongoing studies have focused on internal and international parental migration and its impact on health of left behind children. One of the recently completed studies entitled "children living apart from parents due to internal migration (CLAIM)" looks at parental internal migration and impact on different issues among children living separately. This project was funded by UNICEF and implemented by Institute for Population and Social Research (IPSR), Mahidol University (for more details, http://www.ipsr.mahidol.ac.th/ipsr/ContentDetail_TH.aspx?pid=394). The other recently completed project entitled 'child health and migrant parents in South-East Asia (CHAMPSEA)'. The study explores the impact of transnational parental migration on children left behind. This project is supported by Wellcome Trust, UK and implemented by Institute for Population and Social Research (IPSR), Mahidol University (for more detail, http://www.ipsr.mahidol.ac.th/ipsr/Contents/Research/345-CHAMPSEA-BriefReport_Eng_Lampang.pdf).

Studies also point out to other factors that have mediating impacts of parental migration on children left behind. One of the factors often mentioned is the role of caregivers. Xiang's reviews of studies on children left behind in China showed children develop behaviors at two extremes under the care of their grandparents. Children left behind are either withdrawn or excessively aggressive as their grandparents either spoil or neglect them (Xiang, 2007). Similarly, children who were brought up by grandparents, or having poor economic status, bad relationship and low frequency of communication with parents were prone to encounter more severe loneliness (Jia & Tian, 2010). In studying impacts of parental migration, most studies recognize the contribution of extended family in mitigating inverse impacts on

children from living separately from parents. Many existing studies show that most of the children of transnational migrants are left with relatives or foster caregivers who play an important role in providing care, and ensuring wellbeing (Asis & Baggio, 2003; Battistella & Conaco, 1998; Ganepola, 2002; Gardner, 1995; Mendoza, 2004). Furthermore, studies found that where mothers migrate, most left-behind families will enlist the help of extended family members, often female or even friends to undertake caring or nurturing tasks vacated by the absent mothers (Gamburd, 2000; Parreñas, 2005; SMC, 2005). In such cases, left-behind people live with grandparents or aunts that change nuclear family to extended family after migration takes place. Extended household may fill the gaps resulting from the migrant's absence (De Bruijn et al., 1992). Transnational "circuits of affection, caring and financial support", succeeding in keeping their families physically and emotionally intact throughout the period of their absence (Hondagneu-Sotelo & Avila, 1997).

Finally, migration of one or both parents and their gender (mother or father) may affect their children's social behavior in different ways. Some studies show that migration is not necessarily disruptive for the children left behind if it is not the mother who migrates (Battistella & Conaco, 1998). Moreover, the children of migrant mothers felt lonely, angry, unloved, afraid, and worried compared with children of non-migrants (SMC, 2005). Another study also found that a mother's out migration is positively associated with child morbidity (Phuc et al., 2009) and mortality (Konseiga et al., 2009). Study conducted by Jampaklay also found more negative effects on the children left behind by mothers and concluded that a mother's love is often irreplaceable even by the best caregivers (Jampaklay, 2006).

2.3 Migration in Thailand

Migration is not a new phenomenon in Thailand and elsewhere. Thailand has been both a migrant sending and receiving country. Improvement in transportation infrastructure, advances in communications technology, increased trade between countries, political instability, poverty, and unemployment in economically disadvantaged areas/countries are some of the important factors that contribute to this phenomenon (ILO, 2006).

2.3.1 Internal migration

Bangkok, a capital city of Thailand, and its surrounding areas have emerged as the major destination for migrants in the entire Greater Mekong Sub-region and for internal migrants from other provinces as well. According to National Statistical Office (NSO) data, the percentage of the population who are lifetime internal migrants (living in a different province than that of their place of birth) was 11 per cent in 1960 and it has increased to 17 per cent in 2000 (NSO cited in Thailand Migration Report 2011). Bangkok has net gain due to migrants through 1965-2000. In 1965-70, 64.5 thousands in-migrants lived in Bangkok which has increased to 134.7 thousands in-migrants in 1995-2000. In central region, excluding Bangkok metropolis, the net loss of people due to out-migration can be seen before the period of 1980. However, this region has net gain of 293.4 thousands in-migrants in 1985-1990 periods which have increased to 671 thousands in-migrants in 1995-2000. The Northern region and North-eastern region has net loss through 1965 to 2000 periods. In southern region, the net loss was found before the period of 1990. However, in 1995-2000, there were 57.9 thousands net gain in South region (Table 2.1).

Table 2.1 Net gain or loss by region (in thousands)

Region	1965-1970	1975-1980	1985-1990	1995-2000
Bangkok metropolis	64.5	212.3	365.9	134.7
Central (excluding Bangkok metropolis)	-11.2	-5.8	293.4	671.0
North	-3.2	-23.9	-89.3	-71.6
Northeast	-47.6	-181.3	-553.7	-369.7
South	-2.5	-1.3	-16.3	57.9

Source: NSO, cited in Thailand Migration Report 2011

Since the census data does not include the information of people who migrated for a shorter period and returned, the data from census may underestimate migration. The National Migration Survey, conducted in 1992, found that 22 per cent of the population had moved elsewhere for one month or more in the past five years (Chamratrithirong et al., 1995). Rural to urban migration was more than double during

the period between 1975-1980, and 1985-1990 in Bangkok (Anh, 2003; Guest, 2003) when the service sector was greatly expanding in Bangkok.

2.3.2 Overseas migration

According to Department of Employment, Ministry of Labor, the number of documented Thai workers working in overseas companies recorded in 2010 was 143,815 persons (Department of Employment, Ministry of Labor: www.overseas.doe.go). However, the actual number of overseas Thai workers is estimated to be higher than the official figure. It is also reported by Labor Development Plan in 2008 that there are at least one million Thai workers working in 11 countries abroad (http://www.mol.go.th/mol_modelscheme.html).

The number of Thai contract laborers working overseas has fluctuated over the last decade. After reaching a peak during the economic crisis in the late 1990s, the export of Thai labor gradually declined, before significantly rising again in the last two years due to increased demand from Israel, the United Arab Emirates, Qatar, and new market openings with the Republic of Korea (MLO, 2008 cited in Sciortino and Punpuing, 2009).

It is notable that an overwhelming majority of Thai international migrant workers are males (84%), while female migrants account for only 16% of the total number of migrants in 2010. The percentage of documented women migrant is virtually constant over time (Overseas Employment Administration Office, Ministry of Labor, 2007). Lower percentages of international female migrants could be due to the role of women, which involves petty trading and foraged produce. Such contributions to family well-being are regarded as their duty (Singhanetra-Renard & Prabhudhanitisarn, 1992). The other reason could be due to Thai culture and norms, as overseas migration are often perceived as men's business. Similarly, limited opportunities in the labor market abroad also limits female international migration.

The concentration of Thai labor is very high in Asian countries followed by Middle East countries. Very few Thai labor migrants can be found in Europe, Africa, North America, Australia & Oceania, and South America. In 2007, two thirds of the Thai laborer migrants were (67%) in Asian countries, and about one in five was in Middle East (21%). Five per cent and three per cent of Thai laborer migrants were

in Europe and North America respectively, while almost none were in South America (Table 2.2).

Table 2.2 Percentage of documented Thai workers overseas by continent of country of destination by sex, 2007

Continent of country of destination	Male	Female	Total
Asia	66.09	72.97	67.11
Middle east	22.67	10.67	20.90
Europe	5.09	8.06	5.53
Africa	3.81	1.16	3.41
North America	1.71	5.28	2.24
Australia & Oceania	0.63	1.84	0.81
South America	0.00	0.02	0.00
Total	**100.0**	**100.0**	**100.0**
N	**137,922**	**23,995**	**161,917**

Table adjusted from http://www.overseas.doe.go.th/oeao_th/news/news_body.html

Taiwan, Singapore, South Korea, Libya, and Israel are the top most 5 popular destination for the Thai male workers while Taiwan, Hong Kong, Japan, South Korea, and Malaysia were the top most 5 popular countries for Thai Female workers. Taiwan is the most preferred country for both Thai male and female. For instance, in 2010, the highest number of male (n=29,477), and female (n=5,540) emigrants were working in Taiwan. Similarly, the second highest destination for Thai male workers was Singapore (n=12,264) while Hong Kong has the second highest destination for Thai female workers (2,929). Similarly, the third preferred county for Thai male workers was South Korea (n=8,869) while Japan (n=2,043) was the third preferred country for Thai Female workers (Table 2.3).

Table 2.3 Top five countries of destination by sex, 2010

Countries	Male	Countries	Female
Taiwan	29,477	Taiwan	5,540
Singapore	12,264	Hong Kong	2,929
South Korea	8,869	Japan	2,043
Libya	8,087	South Korea	1,225
Israel	7,655	Malaysia	1,163

Table adjusted from http://www.overseas.doe.go.th/oeao_th/news/news_body.html

2.4 Number of children left behind in Thailand

In Thailand, about a fifth of 64 million populations are younger than 15 years (IPSR, 2010). There are no precise statistics on the exact number of children left behind by parental internal and international migration. So it is often necessary to make inferences about children of migrants from data on the migrants themselves. Bryant reviews the literature and suggests that about half a million of Thai children (2-3% of total children aged 0-14) are left behind due to parent overseas. Among migrants, male migrants are very high in Thailand which suggest that children left behind are more likely to have absent fathers than absent mothers (Bryant, 2005). Similarly, a recent report mentions that about 20 per cent of Thai children are not living with their parents, largely because of significant levels of internal migration (Huguet & Chamratrithirong, 2011).

2.5 Conceptual frameworks

The conceptual frameworks of this study are guided by several theoretical perspectives, and several previous studies that have shown the relationship among various causal factors and health of children left behind. The conceptual frameworks are designed to show the influence of independent variables on health status of children left behind. There are two conceptual frameworks. One framework is for the impacts of parental internal migration on the physical health of children left behind, and the other is for the impact of parental international migration on the physical, and the psychological well-being of children left behind. Due to the constraint of the data availability, this study could not measure the impact of parental internal migration on the psychological well-being of children left behind. The framework consisted of four domains of independent variables. The main independent variable of this study is parental internal/international migration, and the other independent variables are individual/children characteristics, household characteristics, and community characteristics for internal migration (KDSS data), and individual/children characteristics, household characteristics, and caregivers characteristics for international migration (CHAMPSEA data).

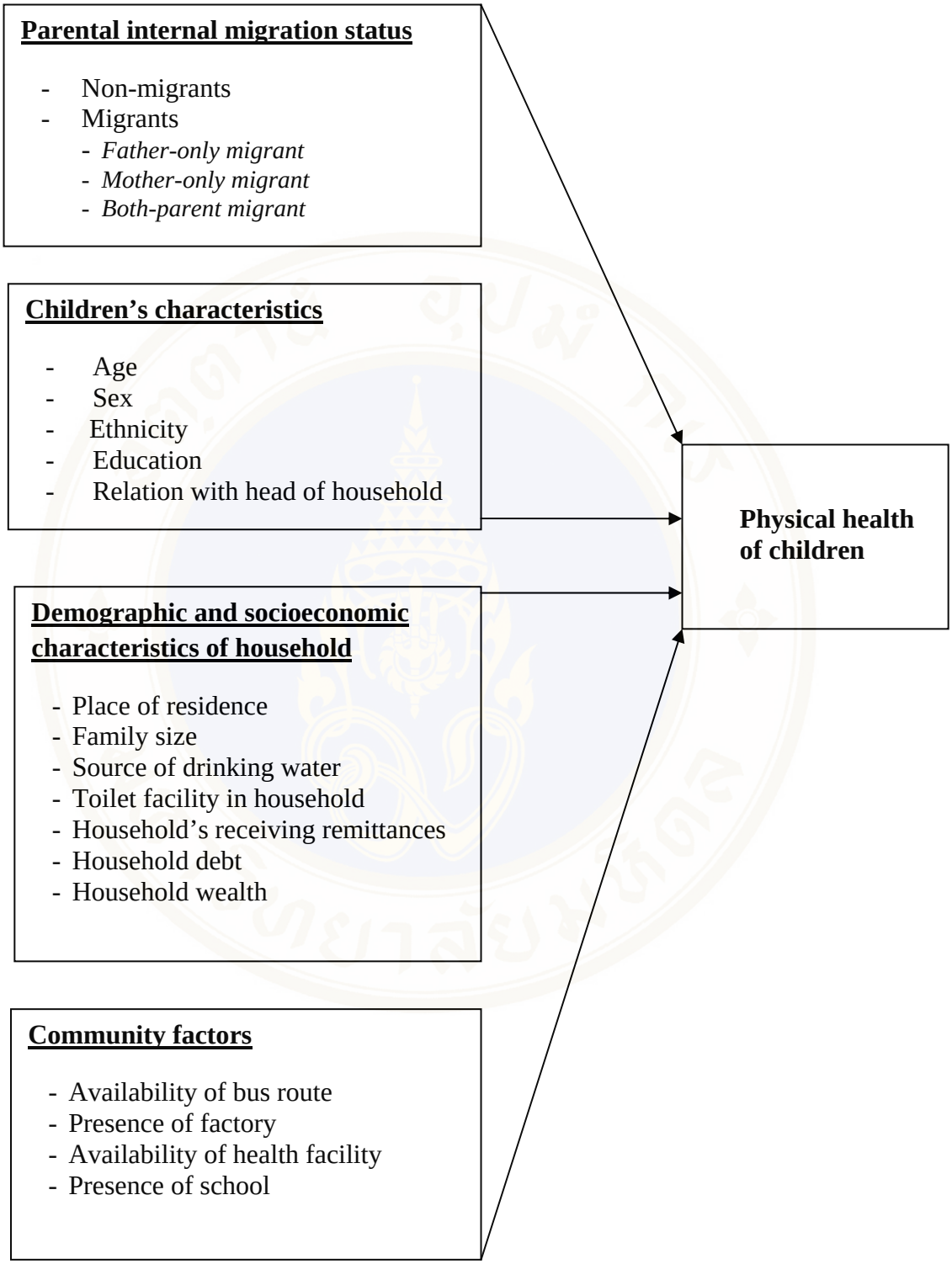

Figure 2.1 The impact of parental internal migration on the physical health of children left behind

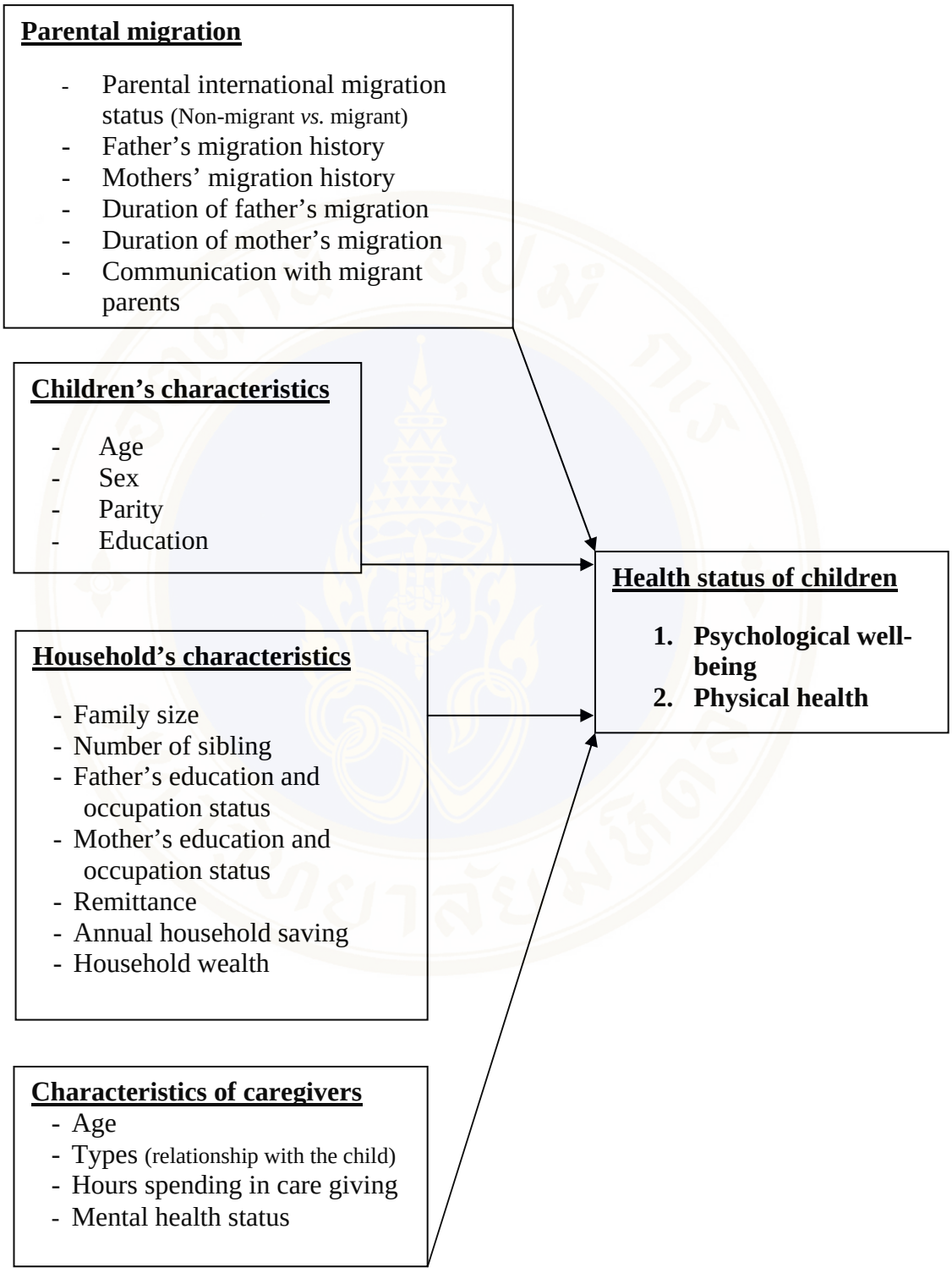

Figure 2.2 The impact of parental international migration on the physical health, and the psychological well-being of children left behind

2.6 Hypotheses

1. Internal out migration of parents is negatively associated with health of children left behind (as measured by presence of illness) compared to children living with both parents.

2. Migration of mother is negatively associated with health of children (as measured by presence of illness) than children of migrant fathers, when compared to children living with both parents.

3. Children living in transnational households have poorer physical and psychological well-being (as measured by presence of abnormal emotional and behavior symptoms) compared to children living with both parents.

CHAPTER III
RESEARCH METHODOLOGY

This chapter presents the methodology used for this study. This chapter covers sources of data, study sites, study population, unit of analysis, and definition and concepts. This chapter also presents operational definition of variables that were used in this study, and method of analysis. Finally, this chapter discusses the limitation of the study.

3.1 Sources of data

This study uses the data from two sources namely i) Child Health and Migrant Parents in South-East Asia (CHAMPSEA), 2008, and ii) Migration and Health, Kanchanaburi Demographic Surveillance System (KDSS), 2007.

The CHAMPSEA data addressed the research questions regarding parental international migration and its impact on children's psychological well-being and physical health, and Migration and Health data set addressed the research questions regarding the impact of parental internal migration on physical health status of children.

3.1.1 Child Health and Migrant Parents in South-East Asia (CHAMPSEA)

3.1.1.1 About the project

CHAMPSEA project used both qualitative and quantitative methods for investigating the impacts of parental *international* migration on children left behind in four South-East Asian Countries (Indonesia, the Philippines, Thailand, and Vietnam). This dissertation has used the quantitative data from Thailand. The CHAMPSEA project used cross-sectional design to collect information. A flexible-

quota sampling design was used to recruit households with a child aged 3, 4, 5 years, and/or 9, 10, 11 years. The survey covered 1,030 households in Thailand. Those households were eligible in which a child in a specified age range, at the time of the survey, either one or both parents were transnational migrants (transnational households), or where both parents were present in the households ('usual resident' households). The criteria for the duration of parental migration were taken at least six months. If the one or both parents of the household have been absent and working abroad for a continuous period of at least the past six months prior to the survey then that household was qualified as a transnational household. Similarly, 'usually resident' household was taken as one in which both parents had been living at the same address as the eligible child on the most nights over the past six months. Structured interviews with a responsible adult in the qualifying household was used, with the caregiver of the target child (who may be or may not be the same person as the responsible adult), and with the target child if s/he was of school age. About half of the sample was children aged 3-5 years, and they were requested to participate in a short activity to draw a picture of their family. This research is approved by Institutional Review Board (IRB) of Institute for Population and Social Research, Mahidol University, Thailand.

In CHAMPSEA project, information about child physical and psychological well-being was collected from the interview of both the older child him/herself, and from the caregiver as the caregiver of child is the most knowledgeable on the child's health. However, this dissertation used information collected from the caregiver of the target child (for more detail see: http://www.ipsr.mahidol.ac.th/ipsr/Contents/Research/345-CHAMPSEA-BriefReport_Eng_Lampang.pdf).

3.1.1.2 Study sites

CHAMPSEA project was launched in two provinces, Udon Thani and Lampang. Udon Thani is the province with the highest number of out migrants (20,534 emigrants) working abroad, and Lampang (6,035 emigrants) is ranked eighth among all the provinces. Udon Thani is located in Northeast of Thailand, and Lampang is located north of Thailand. These provinces with the highest number of out-migrants were selected to increase the probability of meeting the survey quotas of eligible households within the time period.

3.1.1.3 Study population

CHAMPSEA aims to deal with the child of both sexes aged 3, 4, 5 years, and/or 9, 10, 11 years. This project covered a total of 1,030 children. Of the total children, only three children have migrant mother (mother-only migrant). So this dissertation excluded the three cases having mother-only migrant. Therefore, a total of 1,027 children in CHAMPSEA project were the study population in this study. Among these children, 508 were younger (aged 3, 4 and 5), and 519 were older (aged 9, 10, and 11). Out of these total children, 516 children were from migrant parents (either one or both parents), and 511 children were from non-migrant parents.

3.1.2 Migration and Health, Kanchanaburi Demographic Surveillance System (KDSS)

3.1.2.1 About the project

The migration and Health, Kanchanaburi Demographic Surveillance System, 2007 was used to analyze the impact of parental *internal* migration on the physical health of children. Kanchanaburi DSS commenced in 2000 with support from the Wellcome Trust. Although this Migration and Health survey (2007) focused on youth population aged 15-29, information regarding children and their physical health status can be found in the household questionnaire. However, this survey did not collect information about psychological well-being of children. So, this dissertation explores the impact of parental *internal* migration on the physical health status of children left behind from the KDSS data (For more detail, visit http://www.ipsr.mahidol.ac.th/ipsr/Research/KanchanaburiProject/). This research is approved by Institutional Review Board (IRB) of Institute for Population and Social Research, Mahidol University, Thailand.

3.1.2.2 Study sites

Migration and Health, Kanchanaburi Demographic Surveillance System (KDSS), 2007 was conducted in Kanchanaburi province. Kanchanaburi shares a long border with Myanmar, and contains a variety of ethnic groups, and migrants, both documented and undocumented, from Myanmar. The information was collected from 106 sites (94 villages and/or 12 urban census blocks) scattered throughout the province. The primary sampling units for rural areas were villages, and for urban areas were census blocks. Sites' selection was undertaken using a stratified systematic sample design. A census of all communities in the field station population has been undertaken. The census includes the administration of a household questionnaire for all household members, and individual questionnaires for household members aged 15 years and over.

3.1.2.3 Study population

This dissertation aims to deal with the child of both sexes aged less than 15 which were covered in Migration and Health Survey in KDSS. To compare left behind children by internal migrants parents with non-left behind, I excluded those children whose one or both parents have died, or/and whose parents are international migrant(s). After excluding these numbers, a total numbers of children under 15 years were 11,241. Among these children 1,629 children had internal migrant parent(s), and 9,612 children parents are non-migrants.

3.2 Definition and concepts

Parental international migration:

The term parental international migration in this study refers to whether a child's father, mother or both parents have been absent from home and working abroad for a continuous period of at least the past six months prior to the survey.

Parental internal migration:

In this study, parental internal migration refers to whether a child's father, mother or both parents usually live in another province within the country.

Child:

The definition of child varies in different settings. According to the convention on the Rights of the Child (CRC) 'a child means every human being below the age of eighteen' (United Nations, 1989). However, for CHAMPSEA study, the information has collected from a child aged 3, 4, or 5 years, and/or 9, 10 or 11 years. In this study, in KDSS data, a person less than 15 years was considered a child.

Children left behind/children living separately from parent(s)/children of migrant parent(s):

This study uses the definition of "children left behind", "children living separately from parent(s)" or "children of migrant parent(s)" as children who remain in the country of origin (in CHAMPSEA data)/province (in KDSS data) when their father, mother, or both parents have been absent working abroad (in CHAMPSEA data)/another province (in KDSS data).

Non-left behind children /children living with parents /children of non-migrant parents:

This study uses the definition of “non-left behind children”, “children living with parents”, or “children of non-migrant parents” as children who usually stay with both parents and neither of the parents are internal or international migration.

3.3 Variables

3.3.1 Dependent variables

Dependent variables of this study are psychological well-being, and physical health (incidence of illness, and nutritional status) of children.

3.3.1.1 Psychological well-being

The Strength and Difficulty Questionnaires (SDQ) was used to assess the psychological well-being of children. SDQ measures 25 emotional and behavioral symptoms. Each item is scored from 0 to 2 (not true, somewhat true and certainly true). SDQ is a validated instrument to screen children, and adolescent emotional, and behavioral problems. The SDQ is a brief behavioral screening instrument developed by Goodman evaluated in Great Britain (Goodman, 1997; Goodman, 1999; Goodman, 2001; Goodman et al., 2000) and has been used and evaluated extensively in many countries (Achenbach et al., 2008; Bourdon et al., 2005; Heiervang et al., 2008; Woerner et al., 2011).

SDQ includes five factors: emotional symptoms (e.g. worries, often unhappy etc); hyperactivity (e.g. restlessness; cannot sit for long, etc.); problems with conduct (e.g. fight a lot, often have hot temper, etc.); peer problem (e.g. bullied by others, tend to play alone, etc.), and pro-social behaviors (often volunteer to others, shares readily with other children, etc.). A total difficulties score is calculated as the sum of scores of the conduct, hyperactivity, emotional, and peer problems scales (Goodman 1997; Goodman et al, 2000). Another sub-scale assessed the positive aspect of pro-social behavior.

A total difficulties score was calculated as the sum of scores of the conduct, hyperactivity, emotional, and peer problems scales, and categorized into three categories (normal, borderline, and abnormal). Total difficulties score ranged from 0 to 40, and the five sub scales were each scored from 0 to 10. Many literatures analyzed SDQ (total difficulties score or sub scale of SDQ) using either continuous scale or categorical scale data. SDQ has three versions: by parents, by teacher, by responsible adult of children. However, this study used the SDQ assessed by responsible adult.

A study conducted by Woerner and others in Thailand in 2011 to establish national norms in SDQ found that problem scores were higher among Thai children than those observed in western countries. They suggested that Thai SDQ norms probable behavior problem if the total difficulties score is 19-40 in the parent-rated form. According to Thai version of SDQ, the cut-off level for normal mental health/good psychological well-being is below 16 (0-15); borderline is 16 to 18, and abnormal is 19 and above (19-40) (Woerner et al, 2011). In this study, estimates of frequency of possible mental disorders based on normative data for Thailand cut offs developed by Woerner and others was used to describe the psychological well-being of the children in Thai context (Woerner et al., 2011).

3.3.1.2 Physical health

In CHAMPSE data, physical health was measured by incidence of illness within the last two weeks prior to the survey and nutritional status of children. Illness was measured by cold/cough/fever/flu, stomach ache, diarrhea, eye problems within the last two weeks prior to the survey. One composite index from the above mentioned symptoms was constructed before the analysis. Then the score was categorized into two categories. Those children who did not suffer from any illness mentioned above during the reference time period was categorized as ‘good health’ or ‘no incidence of illness’, children with the presence of at least one incidence of illness during the reference time period are considered ‘poor health’ or ‘had incidence of illness’.

Anthropometric measurement of children is the other way of examining the impacts of migration on the physical well-being of left-behind children. The height and weight data are used to compute three summary indices (height-for-age; weight-

for-height and weight-for-age) of nutritional status in this study. Children whose height-for-age is below minus two standard deviations from the median of the reference population are considered stunted or short for their age. Children whose weight-for-height is below minus two standard deviations from the median of the reference population are considered wasted or thin**.** Children whose weight-for-age is more than two standard deviations from the median of the reference population are considered overweight.

In Migration and Health, KDSS survey data, there is a question related to physical health (incidence of illness) in the household questionnaire. The question was: Did this person (name…..) get sick in the past one month? A child who did not get sick was treated 'good health' or 'no incidence of illness', and who had at least one incidence of sickness or felt sick in the reference period was treated as 'poor health' or 'had incidence of illness'.

It should be noted that the results from these two data sets cannot be compared as these surveys have adopted different methodologies in the data collection, and used the different measurement of the physical health. However, findings from the analysis of these two data sets would supplement each other to address different aspects of migration impacts (internal and international) on children left behind.

3.3.2 Main independent variable

Parental migration: In CHAMPSEA project, parental international migration refers to whether a child's father, mother or both parents have been absent working abroad for a continuous period of at least the past six months preceding the survey. This survey found that there were very few mother of children (n=3) have been absent working abroad. Therefore this study has excluded mother-only migrant cases. So this variable was categorized into two categories only, and coded; 0= no parental international migration, and 1=parental international out migration.

In KDSS survey, parental internal migration refers to whether a child's father, mother or both parents temporary migrated/lived in another province at the time of the survey. First, this variable was categorized into two categories, and coded;

0= no parental migration, and 1=parental internal out migration. Furthermore, parental migration variable was also categorized into four categories, and coded; 0=no parental migration, 1=mother-only migrant, 2=father-only migrant, 3=both parents migrant.

3.3.3 Other independent variables

This study includes other following independent variables.

3.3.3.1 Individual-level variables/children characteristics:

Individual-level variables included socio-demographic characteristics of children. Age, sex, level of education, and parity were available and included as individual-level variables in CHAMPSEA data while age, sex, ethnicity, level of education, and relationship with head of the household were available and included in the analysis of KDSS data.

3.3.3.2 Household-level variables:

Household-level variables available in KDSS data were place of residence, family size, source of drinking water, toilet facility, remittance, household debt, and wealth quintiles. Similarly, in CHAMPSEA data, family size, sibling, presence of grandparents in the household, fathers' and mothers' education and occupation, remittance, annual household saving, and household wealth status were available and used as household level variables. Furthermore, caregivers' characteristics such as age, types of caregivers, hours spent in caring for children, and psychological well-being of caregiver were available and used in the analysis.

3.3.3.3 Community-level variables:

Information about community-level (village-level) variables was available only in the KDSS data. Community-level variables included in this study were availability of bus route in the village, presence of factory in the village, availability of health facility in the village, and presence of school in the village.

Table 3.1 Operational definitions of variables and their measurements: KDSS data

	Variables	Description	Measurement
1	**Dependent variable**		
	Physical health	Physical health condition of a child (whether a child had incidence of illnes within a month prior to the survey)	0= Good (no incidence of illness) 1= Poor (at least one incidence of illness)
2	**Main independent variable**		
	Parental internal migration	Whether or not a child's father, mother or both parents temporary migrated/ lived in another province within the country at the time of the survey	0=Non-migrant 1=Mother-only migrant 2=Father-only migrant 3= Both parents migrant
3	**Other independent viarables**		
3.1	**Individual/children characteristics**		
	Age	Age of child at time of survey	2=0-4 years 1=5-9 years 0=10-14 years
	Sex	Sex of the child	0= Female 1= Male
	Ethnicity	Ethnicity of child	0=Non-Thai 1=Thai
	Education	Completed level of education of child at survey time	0 =Have no school yet 1= Below primary 2= Primary 3= More than primary
	Relationship with head of the household	Relationship of children with the head of the household	0= Grand child 1= Child 2= Nephew/niece 3= Others

Table 3.1 Operational definitions of variables and their measurements: KDSS data (cont.)

3.2	**Household characteristics**		
	Place of residence	Place of residence of the child	0= Urban 1= Rural
	Family size	Total number of family members in the household	0= Up to 4 members 1=5-7 members 2=8 or more members
	Source of drinking water	Source of drinking water in the household	0= Tap water 1=Rain water 2=Shallow water 3= Under-ground water
	Toilet facility in household	Whether or not household has own toilet facility	0= No 1= Yes
	Household remittances	Whether or not household has received remittances within a year prior to the survey from either migrant parents or/and other family members	0=No remittance/no migrants 1= less than 10,000 2= 10,000-25,000 3= More than 25,000
	Household debts	Whether or not the household has debts at the time of survey	0= No 1= Yes
	Wealth status	The household wealth index was created by using principal component analysis (PCA) of household characteristics and assets; the households were then divided into quintiles.[1]	0= Poor (2 bottom quintiles) 1= Middle (2 medium quintiles) 2= Rich (5th quintile)
3.3	**Community level factors**		
	Availability of bus route	Whether or not village has availability of bus route	0= No 1= Yes
	Presence of factory	Whether or not village has factory	0= No 1= Yes
	Availability of health facility	Whether or not village has health facility	0= No 1= Yes
	Presence of school	Whether or not village has any kind of school	0= No 1= Yes

[1] Variables used in the PCA included type of roof material, type of wall, type of floor, sufficiency of water, whether the household had electricity and 17 other household assets (color TV, VDO/VCD/DVD, satellite dish, audio equipment stereo, radio, mobile phone, telephone, computer, air conditioner, sewing machine, washing machine, microwave, refrigerator, bicycle, motorcycle, car, pick up/van).

Table 3.2 Operational definitions of variables and their measurements: CHAMPSEA data

	Variables	Description	Measurement
1	**Dependent variable**s		
	A. Psychological well-being/ mental health	Measured by the Thai version of Strength and Difficulty Questionnaires (SDQ) (a set of 25 statements)	0=Normal/borderline 1=Abnormal
	B. Physical health		
	i. Incidence of illness	Whether or not a child had symptom(s) of Illness (cold/cough/fever/flu, stomach ache, diarrhea, eye problems) within the last two weeks prior to the survey	0= Good (no incidence of illness) 1= Poor (at least one incidence of illness)
	ii. Stunting	Children whose height-for-age is below minus two standard deviations (-2SD HAZ) from the median of the reference population are considered stunting or short for their age	0= No 1= Yes
	iii. Overweight	Children whose weight-for-age is more than two standard deviations (2SD<age 5/1SD>age5 BAZ) from the median of the reference population are considered overweight	0= No 1= Yes
	iv. Thin	Children whose weight-for-height is below minus two standard deviations (-2SD WAZ<age 10/BAZ>10) from the median of the reference population are considered wasted or thin	0= No 1= Yes
2	**Main independent variables**		
	Parental international migration	Whether a child's father, mother or both parents have been absent working abroad for a continuous period of at least past six months preceding the survey	0= Non-migrants 1= Migrant(s)
	Father's migration history	Whether or not children's father has migration history since a child was born	0= No 1= Yes

Table 3.2 Operational definitions of variables and their measurements: CHAMPSEA data (cont.)

	Variables	Description	Measurement
	Mothers' migration history	Whether or not children's mother has migration history since a child was born	0= No 1= Yes
	Duration of father migration	Duration of father's migration since the child was born	0=Never migrant after child was born 1=Less than 1 year 2= 1-2 years 3= 3 or more years
	Duration of mother migration	Duration of mother's migration since the child was born	0=Never migrant after child was born 1=Less than 1 year 2= 1-2 years 3= 3 or more years
	Communication with migrants parents	Communication with migrant parents (father)	0= Non-migrants 1= Less than once a week 2= Weekly 3= Daily
3	**Other independent viarables**		
3.1	**Individual/children characteristics**		
	Age	Age of child at time of survey	0= Younger (3-5 years) 1= Older (9-11 years)
	Sex	Sex of the child	0=Female 1= Male
	Education	Completed level of education of children	0=No schooling (young) 1= Primary or below
	Parity	Birth order of child	0= First 1= Second 2= Third order
3.2	**Household characteristics**		
	Family size	Number of family member in the household	0= Up to 3 members 1=4-5 members 2= 6 or more members
	Sibling	Whether or not a child has a sibling	0= No 1= Yes
	Grandparents	Whether or not a child has a grandparents in the same house	0= No 1= Yes

Table 3.2 Operational definitions of variables and their measurements: CHAMPSEA data (cont.)

	Variables	Description	Measurement
	Father's education status	Education level of father	0=Below primary (<6 years) 1= Primary (6-12 years) 2= Secondary or above (more than 12 years of schooling)
	Father's occupation status	Occupation status of father	0= Agricultural /domestic sectors 1= Non-agricultural sectors
	Mother's education status	Education level of mother	0=Below primary (<6 years) 1= Primary (6-12 years) 2= Secondary or above (more than 12 years of schooling)
	Mother's occupation status	Occupation status of mother	0= Agricultural /domestic sectors 1= Non-agricultural sectors
	Remittances	Whether or not household received remittances from migrants family members in the last six months prior to the survey	0= No remittance/no migrants 1= Less than 60,000 2= 60,000-120,000 3= More than 120,000
	Annual household saving	Annual household saving	0= No saving 1=Less than 20,000 2= 20,000-40,000 3= More than 40,000
	Household wealth	Wealth index constructed using Principal Component Analysis (PCA) from possession of household durable goods	0= Poor (2 bottom quintiles) 1= Middle (2 medium quintiles) 2= Rich (5th quintile)

Table 3.2 Operational definitions of variables and their measurements: CHAMPSEA data (cont.)

	Variables	Description	Measurement
3.3	**Caregivers characteristic**		
	Age	Age of the primary caregiver of child	0= Less than 30 years 1=30-39 years 2=40 years or more
	Types	Types of primary caregiver of a child	0= Biological parents (mother) 1= Grandparents/ other
	Hours spending in care giving	Hours spent in care giving for a child by primary caregiver	0= Less than 6 hours 1= 6 hours and over
	Psychological well-being	Psychological well-being of primary caregiver measured by self reporting questionnaire 20 (SRQ-20) developed by WHO	0= Healthy (less than 8 symptoms) 1= Unhealthy (8 or more symptoms)

3.4 Methods of analysis

Firstly, univariate analysis was used to provide descriptive characteristics of the children according to individual, household, and community characteristics. Both bivariate and multivariate analyses were then performed to show the association between parental migration and health status of children left behind. The KDSS data have different level of hierarchical (individual, household, and community) data. Outcome variable is hypothesized to be influenced simultaneously by various factors from the different levels. Multilevel regression provides an analytical framework to address the nature of hierarchical data. The effect of community-level was adjusted in the analysis. The main rationale for using a multilevel model in this data is to get the correct standard errors for the household-level and community-level variables.

Similarly, in CHAMPSEA data, variable related to physical health of children (incidence of children's illness and nutritional status) and psychological well-being/mental health were categorized into two categories (1=having problem; 0=else). Before making composite variable for total difficulty score (to measure mental health), Cronbach's alpha was applied to see the internal consistency of different SDQ sub scales and scale. Chi-square test was used to examine the association between

dependent variable and other independent variables. Multivariate logistic regression was performed to examine the net effect of parental migration on health of children after simultaneously controlling for other (individual, household, community-level) variables. Before using multivariate analysis, the correlation matrix was applied to discover the degree, and direction of the relationship between each pair of independent variable and dependent variable. Highly correlated ($r>0.65$) independent variables were removed from the multivariate analysis.

3.5 Limitation of the study

This study has several strengths. It is based on data sets with large sample size and rich information in several domains (e.g., individual, household, and community environment). In addition, this study employs the first comprehensive data set on impacts of international migration. Yet, the study's limitations should be recognized. First of all, the data used in this study are from cross-sectional studies; all the factors analyzed in the study were measured at a single point in time. Therefore, the analysis can only provide evidence of statistical association between those variables and the physical health status of the children. Secondly, all of the information for the health status was gathered from the caregivers or head of the household, which may have resulted in reporting bias, such as under-reporting of stigmatizing behaviors (HIV/AIDS, TB etc), or over-reporting healthy behavior. However, to minimize reporting bias, questions were asked of the primary caregivers (for CHAMPSEA data) or household head (for KDSS data) in private settings, away from other people in the household. Furthermore, recall error about migration history or incidence of illness could be another limitation. We also need to be cautious to interpret the result because information about health was self-perceived or self rated response. The use of self-reported data may introduce some reporting bias whereby some groups (for example, older people or less educated people) may be less likely to accurately recall health condition of their children. Finally, this study limits the generalization of the result to other context because it was conducted in few provinces (Kanchanaburi province for KDSS study, and Udon Thani and Lampang provinces for CHAMPSEA study) of Thailand. However, this study contributes to fill the gap in

literature regarding the impact of parental migration on health of children left behind. Similarly, in the context of Thailand, the findings in this study are important to policy maker and planners to improve health services catering to specific groups in Thailand. The findings are also beneficial to governmental or non-governmental organizations and children's right activists as they design and advocate appropriate interventions related to migration in Thailand.

CHAPTER IV
PARENTAL INTERNAL MIGRATION

This chapter presents results from parental internal out-migration. The results presented in this chapter are derived from KDSS Migration and Health survey. This chapter includes results of descriptive, bivariate, and multivariate analysis. Descriptive analysis presents parental migration status, individual characteristics of the children, household characteristics, and caregiver's characteristics. Bivariate analysis presents associations between physical health status of children and parental migration status as well as other individual, household, and community characteristics. Finally, results from multilevel analysis, which measured the strength of the association between internal out migration of parents and the probabilities of having incidence of an illness among children taking into account other variables are presented.

4.1 Descriptive analysis

4.1.1 Parental migration status

Overall, among children who have both parents, 85.5 per cent of them (11,241 children) lived with both parents and about one seventh (14.5%) had either one or both parent migrant at the survey time. Of the 14.5 per cent, 6% had both (father and mother) migrant parents. Another 6% had migrant father only, while few children (<2%) had migrant mother only (data not shown).

Among children who had migrant parent(s), more than two fifths had father-only migrant (43.6%), and both parents migrant (43.8%) and 12.6 per cent had mother-only migrant (Table 4.1).

Table 4.1 Parental migration status

	N	%
Parental migration status		
Non-migrant	9,612	85.5
Migrant	1,629	14.5
Total	11,241	100.0
Types of migrant parents		
Mother	206	12.6
Father	710	43.6
Both parents	713	43.8
Total	1,629	100.0

4.1.2 Individual characteristics of children

The percentage distribution of children across 3 broad age groups is similar. About half (48.7%) of the children were female. About one out of seven children (15.3%) was non-Thai. These non-Thai children were Karen (7%), Mon (4.3%), and Burmese (2.5%). About half of the children had primary or more education (48.8%). More than three in five children (61.4%) were son/daughters of the head of the household (Table 4.2).

Table 4.2 Individual characteristics of the children

Individual characteristics	N	%
Age group		
0-4 years	3,646	32.4
5-9 years	3,716	33.1
10-14 years	3,879	34.5
Sex of the child		
Female	5,472	48.7
Male	5,769	51.3
Ethnicity		
Non-Thai	1,715	15.3
Thai	9,526	84.7
Level of education		
Have no school yet	3,140	27.9
Below primary	2,607	23.2
Primary	4,713	41.9
More than primary	781	6.9
Relationship with head of household		
Grand child	3,699	32.9
Son/daughter	6,907	61.4
Nephew/niece	465	4.1
Others	170	1.5
Total	11,241	100.0

4.1.3 Household characteristics

Less than one out of ten children (6.8%) lived in urban areas. More than two-thirds (70.8%) had 5 or more family members in their households. An overwhelming majority of children had a tap as a source of drinking water in their household and had their own toilet (80.7% and 89.1%, respectively). About a third of the households received remittances in the past two years from the person who had migrated. Among them, 13 per cent received less than 10,000 Baht while 10% of the household received more than 25,000 Baht in a year. The majority of the children's household was in debt (74.2%). Wealth index was constructed using PCA technique from possession of household durable goods and categorized into three groups; i.e. poor (2 bottom quintiles), middle (2 middle quintiles), and rich (5^{th} quintile) (Table 4.3).

Table 4.3 Demographic and socio-economic characteristics of household

Demographic and socio-economic characteristics of household	N	%
Place of residence		
Urban	768	6.8
Rural	10,473	93.2
Family size		
Up to 4 members	3,279	29.2
5-7 members	4,975	44.4
8 or more members	2,987	26.6
Source of drinking water		
Tap water	9,071	80.7
Rain water	257	2.3
Shallow well	699	6.2
Under ground water	1,213	10.8
Toilet facility		
No	1,227	10.9
Yes	10,014	89.1
Remittances		
No remittances	7,590	67.5
Less than 10,000	1,428	12.7
10,000-25,000	1,139	10.1
More than 25,000	1,084	9.6
Household debt		
No	2,901	25.8
Yes	8,340	74.2
Household wealth status		
Poor (2 bottom quintiles)	4,493	40.0
Middle (2 medium quintile)	4,499	40.0
Rich (5th quintile)	2,249	20.0
Total	11,241	100.0

4.1.4 Community characteristics

About one out of four children (24.2%) lived in the village where bus route was available. More than two-fifths of the children (42.6%) lived in the village that has factory in their village, while only 16 per cent of the children lived in the village where health facility is available in their own village. Moreover, about three in five children (57.9%) had a school (primary/secondary) in their own village (Table 4.4).

Table 4.4 Community-level characteristics

Community-level characteristics	N	%
Availability of bus route		
No	8,519	75.8
Yes	2,722	24.2
Presence of factory		
No	6,457	57.4
Yes	4,784	42.6
Availability of health facility		
Not available	9,462	84.2
Available	1,779	15.8
Presence of school		
No	4,732	42.1
Yes	6,509	57.9
Total	11,241	100.0

4.1.5 Health status of children

Overall, more than one out of four children (25.5%) had symptom(s) of illness during the past one-month prior to the survey. Among those children who had symptom(s), the majority of them (78.2%) suffered from respiratory system illness (Table 4.5).

Table 4.5 Health status of children

Health status	N	%
Incidence of illness		
No	8,379	74.5
Yes	2,862	25.5
Total	11,241	100.0
Disease/symptoms		
Disease of respiratory system	2,238	78.2
headache/dizzy/backache	144	5.0
Problem in digestive system	99	3.5
Accident from vehicle/ machine	52	1.8
Other disease	329	11.5
Total	2,862	100.0

4.2 Bivariate analysis

4.2.1 Incidence of children's illness and parental migration status

As mentioned earlier, one in four children (25.5%) had a symptom(s) of an illness during the past one-month prior to the survey. Table 4.6 shows a clear association between having illness among children with migrant parents and non-migrants parents. For instance, significantly higher ($p<0.001$) percentage of children of migrant parent(s) had any illness (29.2%) than did children whose parent(s) had not migrated (24.8%). When classified by the types of migrant parent, it is notable that a higher proportion of children of one-parent migrant (mother= 31.1% and father= 30.1%) had any illness than children of both-parents migrant (28%) and non-migrant parents (24.8%) (Table 4.6).

Table 4.6 Incidence of children's illness according to parental migration status

	Has illness		Total	
	No	Yes	%	N
Parental migration status* **				
Non-migrant	75.2	24.8	100.0	9,612
Migrant	70.8	29.2	100.0	1,629
Total	74.5	25.5	100.0	11,241
Types of migrant parent* **				
Non-migrant	75.2	24.8	100.0	9,612
Mother migrant	68.9	31.1	100.0	206
Father migrant	69.9	30.1	100.0	710
Both-parent migrants	72.2	27.8	100.0	713
Total	74.5	25.5	100.0	11,241

*Note *** Chi-square test is significant at P<0.001*

4.2.2 Incidence of children's illness and individual characteristics

Individual level variables such as children's age, ethnicity, education level, and relationship with head of household had a significant association with children's illness. For instance, the study found that the higher the ages of children, the lower the percentage of experiencing illness (33.5% among 0-4 children; 24.8% among 5-9 children and 18.6% among 10-14). Similarly, a significantly higher proportion of

children of Thai ethnicity (28.2%) who were not in-school age (32.6%) and who were grandchildren of the head of the household (29.1%) had an illness. On the other hand, sex of children did not have a statistically significant association with children's illness (Table 4.7).

Table 4.7 Incidence of children's illness by background characteristics of children

Individual characteristics	Has illness		Total	
	No	Yes	%	N
Age group* **				
0-4 years	66.5	33.5	100.0	3,646
5-9 years	75.2	24.8	100.0	3,716
10-14 years	81.4	18.6	100.0	3,879
Sex of the child				
Female	74.8	25.2	100.0	5,472
Male	74.3	25.7	100.0	5,769
Ethnicity * **				
Non-Thai	89.9	10.1	100.0	1,715
Thai	71.8	28.2	100.0	9,526
Level of education * **				
Not yet enrolled in school	67.4	32.6	100.0	3,140
Below primary	72.6	27.4	100.0	2,607
Primary	79.4	20.6	100.0	4,713
More than primary	80.4	19.6	100.0	781
Relationship with head of household * **				
Grandchild	70.9	29.1	100.0	3,699
Son/daughter	76.2	23.8	100.0	6,907
Nephew/niece	77.0	23.0	100.0	465
Others	80.0	20.0	100.0	170
Total	74.5	25.5	100.0	11,241

*Note *** Significant at Chi-square test P<0.001*

4.2.3 Incidence of children's illness and household characteristics

Household-level characteristics such as family size, source of drinking water, remittance, household debt, and household wealth, had the significant association with illness. A higher incidence of illness is found among children who had few family members in their house (28.7% among those who had up to 4 members), whose source of drinking water was underground water (31.8%) or shallow well (30.9%), who received remittances less than 10,000 Baht in a year from migrant members of house (30.1%), whose household had debt (26.9%), and who were in the medium wealth index (28.5%), and who were rich (26.6%) had a higher percentage of experiencing an illness during the past month prior to the survey (Table 4.8).

Table 4.8 Incidence of children's illness by demographic and socio-economic characteristics of household

Demographic and socio-economic characteristics of household	Has illness		Total	
	No	Yes	%	N
Place of residence				
Urban	73.4	26.6	100.0	768
Rural	74.6	25.4	100.0	10,473
Family size* **				
Up to 4 members	71.3	28.7	100.0	3,279
5-7 members	76.3	23.7	100.0	4,975
8 or more members	75.2	24.8	100.0	2,987
Source of drinking water * **				
Tap water	76.0	24.0	100.0	9,071
Rain water	69.3	30.7	100.0	257
Shallow well	69.1	30.9	100.0	699
Underground water	68.2	31.8	100.0	1,213
Toilet facility				
No	75.1	24.9	100.0	1,227
Yes	74.3	25.7	100.0	10,014
Remittances * **				
No remittance/no migrants	75.9	24.1	100.0	7,590
Less than 10,000	69.9	30.1	100.0	1,428
10,000-25,000	72.8	27.2	100.0	1,139
More than 25,000	73.0	27.0	100.0	1,084
Household debts * **				
No	78.7	21.3	100.0	2,901
Yes	73.1	26.9	100.0	8,340
Household wealth status * **				
Poor	78.1	21.9	100.0	4,493
Middle	71.5	28.5	100.0	4,499
Rich	73.4	26.6	100.0	2,249
Total	74.5	25.5	100.0	11,241

*Note *** Significant at Chi-square test P<0.001, and *=p<0.05*

4.2.4 Incidence of children's illness and community-level characteristics

The KDSS study had collected information of some important community-level variables such as availability of bus route, existence of factory in the village, availability of health facility, and presence of school in the village. Table 4.9 shows that community-level variables such as availability of bus route in the village, health facility, and presence of school had a significant association with children's illness.

Children from the village without bus route (27.8%) and with no presence of school (28.0%) have experienced illness more than those who had availability of bus route (18.2%) and school (23.6%) in their village. However, a significantly higher proportion of children with the availability of health facility in their village had an illness (29.6%) than those children with no availability of health facility in their village (24.7%). It could be those who live near a health facility are more aware about disease so they reported incidence of minor illness too. With regard to existence of factory, the chi-square test did not show any significant association between illness and existence of factory in the village (Table 4.9).

Table 4.9 Incidence of children's illness by community-level characteristics

Community level characteristics	Has illness		Total	
	No	Yes	%	N
Availability of bus route ***				
No	72.2	27.8	100.0	8,519
Yes	81.8	18.2	100.0	2,722
Presence of factory				
No	74.9	25.1	100.0	6,457
Yes	74.0	26.0	100.0	4,784
Availability of health facility***				
Not available	75.3	24.7	100.0	9,462
Available	70.4	29.6	100.0	1,779
Presence of school ***				
No	72.0	28.0	100.0	4,732
Yes	76.4	23.6	100.0	6,509
Total	74.5	25.5	100.0	11,241

*Note *** Significant at Chi-square test P<0.001*

4.3 Multivariate analysis

4.3.1 The impact of parental migration on children's physical health

Multilevel logistic regression model was used to measure the strength of the association between internal parental migration and the probability of having incidence of an illness among children after taking into account other variables. Before analyzing the data using multilevel logistic regression, multicollinearity among variables were assessed. After assessing multicollinearity in the variables, it was found that the variables "age of children" and "level of education" were highly correlated (r=0.83). Therefore, the variable “level of education” was not entered in the logistic regression model.

Two separate sets of multivariate logistic regression models were fitted. The first set of the models measures migration of parents into 2 groups (non-migrant vs. migrant households) (Table 4.10). The second set uses a sub division of migrant household (non-migrant, mother-only migrant, father-only migrant, both-parent migrants).

Four models were used for each set of the analysis. The first model contained parental migration status as the main independent variable and children’s illness as the dependent variable. In the second model, variables related to children characteristics were added. Socio-economic status of households was included in the third model. In the fourth model, the final model of the analysis, community-level variables were added to examine the net effect of parental migration status on health of children after controlling for the other individual, household, and community level characteristics.

In the first model, parental migration variable was significant. Children whose parent(s) had migrated showed a higher risk of being ill during a month prior to the survey (OR = 1.25; $p<0.05$) as compared with those whose parents did not migrate, without controlling for any other variables. Parental migration remained significant after adding the socio-economic status of households in the model. However, the reduction of odds ratio of parental migration status after adding children characteristics in the model indicates that children’s characteristics were also important in predicting the illness and explain some of parental migration effect.

Furthermore, in this model, age, and ethnicity showed a significant association with physical health of children. When the socio-economic status of household were added in the third model, parental migration status, age of children, and ethnicity were still significant. Furthermore, family size, remittances, household debt, and source of drinking water showed a significant association with incidence of children's illness.

After adding community-level characteristics in the fourth model, all the variables that were significant in the first, second, and third models retained their significance level. However, the reduction of odds ratio in some significant variables indicated that community-level variables also have an impact on incidence of illness of children. Furthermore, one of the community-level variables, i.e. availability of bus route in the village, was a significant predictor for children's physical health. The Log likelihood ratio test indicated that parental migration status, children's characteristics, household socio-economic status, and community characteristics are significantly important in predicting illness of children left behind.

In the final model, the analysis found that parental migration was independently associated with poorer physical health (having incidence of illness) of children who live separately from the parent(s). To be more precise, children whose parent(s) had migrated showed a higher risk of having illness (OR = 1.15; $p<0.05$) as compared with those whose parents did not migrate after controlling for individual, household, and community-level characteristics.

The odds ratio of younger children reflected a significantly higher occurrence of illness compared with that of older children aged 10-14 years (OR=2.34 for children aged 0-4; and 1.53 for children aged 5-9; $p<0.001$). Those children of Thai parents were more likely to have an illness (OR=2.89; $p<0.001$) than those children of Non-Thai parents. Having more family members in household was a protecting factor for having an illness among children. For instance, those children who have 5-7, or 8 or more family members in their household were 20 per cent, and 23 per cent respectively less likely to experience illness compared with children who have up to 4 family members in their households.

Regarding remittances from any member including the child's migrant parents, children from those household which received low remittances (<10,000 Baht during one year prior the survey were more likely to have incidence of illness

(OR=1.32) than children of those household that did not receive any remittance/were not migrants. Furthermore, household having debt is positively associated with poor physical health of children. For instance, children from those households having debt were more likely to have an illness (OR= 1.14) than those from households not having debts. In terms of source of drinking water, children in the household with source of drinking water from shallow well and under-ground source were 36 per cent (OR=1.36), and 29 per cent (OR=1.29) respectively, more likely to have poorer health than their counterparts. Result regarding community-level factors suggest that children from those villages where bus route was available were less likely to have an illness (OR=0.70) than children from those villages where bus route was not available.

In summary, this study found that having migrant parent(s), being young, having few family members in a household, receiving low remittance, being in debt, drinking shallow well water or water from under-ground source, and not having bus route in the village were strong risk factors for poorer physical health of children (Table 4.10).

Table 4.10 Odds ratio from logit model of having an illness according to parental migration status, children, socioeconomic status of households, and community-level characteristic

	Model I	Model II	Model III	Model IV
Parental migration status				
Non-migrant (ref.)	1.00	1.00	1.00	1.00
Migrant	1.25**	1.19**	1.14*	1.15*
Children's Characteristics				
Age group				
0-4 Years		2.28***	2.33***	2.34***
5-9 years		1.51***	1.52***	1.53***
10-14 years (ref.)		1.00	1.00	1.00
Sex of the child				
Female (ref.)		1.00	1.00	1.00
Male		1.03	1.03	1.03
Ethnicity				
Non-Thai (ref.)		1.00	1.00	1.00
Thai		3.62***	3.13***	2.78***
Relationship with head of household				
Son/daughter (ref.)		1.00	1.00	1.00
Grand child		0.93	0.98	0.98
Nephew/niece		0.76	0.80	0.79
Others		0.79	0.84	0.87
Socio-economic characteristics of household				
Place of residence				
Urban (ref.)			1.00	1.00
Rural			0.96	0.97
Family size				
Up to 4 members (ref.)			1.00	1.00
5-7 members			0.79***	0.80***
8 or more members			0.76***	0.77***
Remittances				
No remittances/no migrant (ref.)			1.00	1.00
Less than 10,000			1.33***	1.32***
10,000-25000			1.18	1.19
More than 25,000			1.09	1.12
Household debts				
No (ref.)			1.00	1.00
Yes			1.17**	1.14*

Table 4.10 Odds ratio from logit model of having an illness according to parental migration status, children, socioeconomic status of households, and community-level characteristic (cont.)

	Model I	Model II	Model III	Model IV
Household wealth status				
Poor (ref.)			1.00	1.00
Middle			1.07	1.05
Rich			1.01	0.97
Source of drinking water				
Tap water (ref.)			1.00	1.00
Rain water			1.19	1.13
Shallow well			1.45***	1.36**
Under ground water			1.34***	1.29***
Toilet facility				
No (ref.)			1.00	1.00
Yes			0.91	0.93
Community characteristics				
Availability of bus route				
No (ref.)				1.00
Yes				0.70***
Availability of health facility				
No (ref.)				1.00
Yes				1.17
Presence of school				
No (ref.)				1.00
Yes				0.91
Presence of factory				
No (ref.)				1.00
Yes				0.99
# of observation	11241	11241	11241	11241
Wald Chi2	6.66	229.1	343.7	376.7
Prob>chi2	0.0099	0.000	0.000	0.000
Pseudo R2	0.0011	0.0418	0.0479	0.0518
Pseudo Log likelihood	-6370.5	-6110.8	-6071.7	-6046.9

*Note *** Significant at P<0.001, **=p<0.01 and *=p<0.05*

As mentioned above, a second set of multivariate logistic regression used a subdivision of migrant households to investigate the association between gender of parental migration and children's illness. Four different models were run in this set. In the first model, it is found that children who have migrant mother were 37 per cent (OR=1.37; p<0.05) more likely to have an illness than children from non-migrant

parents. Similarly, children who have migrant father were 31 per cent (OR=1.31; p<0.05) more likely to have an illness than children of non-migrant parents. This study found no significant impact on children physical health between children who have both-parent migrant compared with children whose parents are not migrants. In the fourth model, the results indicate that migration of mother only (OR=1.32, P<0.1), and father only (OR=1.18; P<0.1) is a significant risk factor among children once children characteristics, households characteristics and community characteristics were controlled for. Similarly in the first set of logistic regression (Table 4.10), I find that age, ethnicity, family size, remittance, household debt, source of drinking water, and availability of bus route in the village were significant predictors for children's illness (Table 4.11).

Table 4.11 Multivariate models predicting children's illness

	Model I	Model II	Model III	Model IV
Parental migration status				
Non-migrant (ref.)	1.00	1.00	1.00	1.00
Mother-only migrant	1.37*	1.35*	1.30‡	1.32‡
Father-only migrant	1.31*	1.22*	1.18‡	1.18‡
Both parents migrants	1.16‡	1.11	1.04	1.06
Children's characteristics				
Age group				
0-4 Years		2.28***	2.33***	2.34***
5-9 years		1.51***	1.52***	1.53***
10-14 years (ref.)		1.00	1.00	1.00
Sex of the child				
Female (ref.)		1.00	1.00	1.00
Male		1.03	1.03	1.03
Ethnicity				
Non-Thai (ref.)		1.00	1.00	1.00
Thai		3.62***	3.13***	2.78***
Relationship with head of household				
Son/daughter (ref.)		1.00	1.00	1.00
Grand child		0.93	0.99	0.98
Nephew/niece		0.77	0.81	0.79
Others		0.80	0.84	0.87
Socio-economic characteristics of household				
Place of residence				
Urban (ref.)			1.00	1.00
Rural			0.96	0.97
Family size				
Up to 4 members (ref.)			1.00	1.00
5-7 members			0.79***	0.79***
8 or more members			0.76***	0.76***
Remittances				
No remittances/no migrant (ref.)			1.00	1.00
Less than 10,000			1.34***	1.32***
10,000-25000			1.18	1.19
More than 25,000			1.09	1.12
Household debts				
No (ref.)			1.00	1.00
Yes			1.17**	1.14*
Household wealth status				
Poor (ref.)			1.00	1.00
Middle			1.07	1.05
Rich			1.01	0.97

Table 4.11 Multivariate models predicting children's illness (cont.)

	Model I	Model II	Model III	Model IV
Source of drinking water				
Tap water (ref.)			1.00	1.00
Rain water			1.19	1.14
Shallow well			1.45***	1.36**
Under ground water			1.34***	1.29***
Toilet facility				
No (ref.)			1.00	1.00
Yes			0.91	0.94
Community characteristics				
Availability of bus route				
No (ref.)				1.00
Yes				0.70***
Availability of health facility				
No (ref.)				1.00
Yes				1.17
Presence of school				
No (ref.)				1.00
Yes				0.91
Presence of factory				
No (ref.)				1.00
Yes				0.99
# of observation	11241	11241	11241	11241
Wald Chi2	6.66	229.1	306.7	322.4
Prob>chi2	0.0099	0.000	0.000	0.000
Pseudo R2	0.0011	0.0418	0.0448	0.0489
Pseudo Log likelihood	-6370.5	-6110.8	-6091.6	-6065.5

*Note *** Significant at P<0.001, **=p<0.01, *=p<0.05, and ‡= P<0.1*

4.3.2 The impact of parental migration on children's physical health across sex of children

Previous study shows that impact of parental migration may be different for daughters and sons (Shen et al., 2009). Thus, I further explore whether or not parental migration has same impact on health of male and female children. Two logistic regressions were run separately for female and male children. The first model did not control any variables. In the second model, individual, household, and community characteristics were controlled. The result from the first model, which presented the result without controlling for other variables, showed that female child of migrant father, and mother were more likely (OR=1.33, and OR=1.27 respectively)

to have an illness than female children of non-migrant parents. Similar finding was also found for male child in first model. Male child who have migrant father (OR=1.28), and mother (OR=1.45) were more likely to have an illness compared to male children living with both parents. In the second model which is an extended model showed that parental migration status has significant negative impact on health of female children even after controlling for other individual, household, and community level characteristics on children's illness. For instance, female children who have migrant mother, and father were 25% and 30% respectively, more likely to have an illness than female children living with both parents. However, the result was not same for male children. After controlling for other variables, the significant level of father migration was lost among male children which mean that there was no significant impact of father's migration on health of male children. However, the impact of mother's migration on health of male child remained significant even after controlling for the other variables. Male children who have mother migrant were more likely to have an illness (OR=1.36) than male children who lived with both parents. The other control variable such as age, ethnicity, family size, remittances, household debt, drinking water, and availability of bus route are significant predicators for having illness for both male and female children. For instance, younger children, children from Thai parents, children who have small family size (up to 4), children of household who received little amount of remittances, children from the household whose household has debt, children who usually drink water from shallow well or underground water, and children who lived in the village where bus route was not available were more likely to have illness than their comparison group (Table 4.12).

Table 4.12 Odds ratio from logit model of having illness among male and female children according to parental migration, children characteristics, socioeconomic status of households, and community-level characteristic

Selected predictors	Female		Male	
	Model I	Model II	Model I	Model II
Parental migration status				
Non-migrant (ref.)	1.00	1.00	1.00	1.00
Mother-only migrant	1.27‡	1.25‡	1.45‡	1.36‡
Father-only migrant	1.33*	1.30*	1.28*	1.08
Both parents migrants	1.26‡	1.23	1.07	0.92
Children's characteristics				
Age group				
0-4 Years		2.29***		2.37***
5-9 years		1.52***		1.54***
10-14 years (ref.)		1.00		1.00
Ethnicity				
Non-Thai (ref.)		1.00		1.00
Thai		2.93***		2.66***
Relationship with head of household				
Son/daughter (ref.)		1.00		1.00
Grand child		0.90		1.07
Nephew/niece		0.78		0.81
Others		0.61		1.19
Socio-economic characteristics of household				
Place of residence				
Urban (ref.)		1.00		1.00
Rural		1.01		0.93
Family size				
Up to 4 members (ref.)		1.00		1.00
5-7 members		0.76**		0.83*
8 or more members		0.72**		0.81*
Remittances				
No remittances (ref.)		1.00		1.00
Less than 10,000		1.35**		1.27*
10,000-25000		1.14		1.24*
More than 25,000		1.15		1.08
Household have debts				
No (ref.)		1.00		1.00
Yes		1.13*		1.15*
Household wealth status				
Poor (2 bottom quintiles) (ref.)		1.00		1.00
Middle (2 medium quintile)		1.10		0.99
Rich (5^{th} quintile)		1.05		0.89

Table 4.12 Odds ratio from logit model of having illness among male and female children according to parental migration, children characteristics, socioeconomic status of households, and community-level characteristic (cont.)

Selected predictors	Female		Male	
	Model I	Model II	Model I	Model II
Source of drinking water				
Tap water (ref.)		1.00		1.00
Rain water		1.20		1.05
Shallow well		1.25‡		1.46**
Under ground water		1.32**		1.26***
Toilet facility				
No (ref.)		1.00		1.00
Yes		0.85		1.02
Community characteristics				
Availability of bus route				
No (ref.)		1.00		1.00
Yes		0.69***		0.71***
Availability of health facility				
No (ref.)		1.00		1.00
Yes		1.34		1.23
Presence of school				
No (ref.)		1.00		1.00
Yes		0.89		0.93
Presence of factory				
No (ref.)		1.00		1.00
Yes		1.04		0.96
# of observation	5472	5472	5769	5769
Wald Chi2	5.73	269.5	5.17	251.1
Prob>chi2	0.1255	0.000	0.1601	0.000
Pseudo R2	0.0015	0.0553	0.0011	0.0510
Pseudo Log likelihood	-3083.5	-2917.2	-3285.6	-3121.3

*Note *** Significant at P<0.001, **=p<0.01, *=p<0.05, and ‡= P<0.1*

4.3.3 The impact of parental migration on children's physical health across age group of children

Following the similar logic with having separate analysis for boys and girls, separate analyses for children of different age group was necessary. Table 4.13 presents separate logistic regression according to age group of children. Results show that the significant negative impact of parental migration (mother) among children aged 0-4. For instance, children aged 0-4 who have migrant mother were more likely to have incidence of illness in both basic model (OR=2.03) and extended model (OR=1.92) compared to the children of the same age group who are living with both parents. Although the odds of having an illness among children aged 5-9 of migrant father and both-parent migrant were significant in the basic model without controlling other variables, the significance level has lost when added other individual, household, and community characteristics in the model. Furthermore, as in the previous logistic regression, analysis by age group also found that children of Thai parents, children who have small family size (up to 4 family members), children from those households that received little remittance, and children of village where bus route was not available were more likely to have an illness compared with their comparison group (Table 4.13).

Table 4.13 Multivariate models predicting illness in broad age group of children

Predictors	0-4		5-9		10-14	
	Model I	Model II	Model I	Model II	Model I	Model II
Parental migration status						
Non-migrant (ref.)	1.00	1.00	1.00	1.00	1.00	1.00
Mother-only migrant	2.03**	1.92*	1.36	1.19	1.11	1.02
Father-only migrant	1.18	1.19	1.41*	1.21	1.29	1.18
Both parents migrants	0.96	0.90	1.45**	1.21	1.15	1.12
Children's characteristics						
Sex of the child						
Female (ref.)		1.00		1.00		1.00
Male		1.07		1.02		0.99
Ethnicity						
Non-Thai (ref.)		1.00		1.00		1.00
Thai		2.57***		3.50***		2.32***
Relationship with head of household						
Son/daughter (ref.)		1.00		1.00		1.00
Grand child		0.97		0.99		0.96
Nephew/niece		0.67		0.94		0.72
Others		0.66		0.99		0.96
Socio-economic characteristics of household						
Place of residence						
Urban (ref.)		1.00		1.00		1.00
Rural		1.18		0.83		0.91
Family size						
Upto 4 members (ref.)		1.00		1.00		1.00
5-7 members		0.79*		0.80*		0.77*
8 or more members		0.72**		0.80*		0.78*
Remittances						
No remittances (ref.)		1.00		1.00		1.00
Less than 10,000		1.34**		1.31*		1.32*
10,000-25000		0.98		1.31*		1.47**
More than 25,000		1.03		1.09		1.08
Household debts						
No (ref.)		1.00		1.00		1.00
Yes		1.03		1.04		1.32

Table 4.13 Multivariate models predicting illness in broad age group of children (cont.)

Predictors	0-4		5-9		10-14	
	Model I	Model II	Model I	Model II	Model I	Model II
Household wealth status						
Poor (ref.)		1.00		1.00		1.00
Middle		1.14		1.04		0.95
Rich		1.19		0.83		0.89
Source of drinking water						
Tap water (ref.)		1.00		1.00		1.00
Rain water		0.99		1.41		1.11
Shallow well		1.18		1.69**		1.23
Under ground water		1.27*		1.36*		1.24
Toilet facility						
No (ref.)		1.00		1.00		1.00
Yes		0.98		0.91		0.91
Community characteristics						
Availability of bus route						
No (ref.)		1.00		1.00		1.00
Yes		0.73**		0.70**		0.66***
Availability of health facility						
No (ref.)		1.00		1.00		1.00
Yes		1.17		1.12		1.06
Presence of school						
No (ref.)		1.00		0.92		1.00
Yes		0.93		0.92		0.89
Presence of factory						
No (ref.)		1.00		1.00		1.00
Yes		1.02		0.95		1.01
# of observation	3646	3646	3716	3716	3879	3879
Wald Chi2	9.96	88.0	8.07	123.7	2.61	104.1
Prob>chi2	0.0189	0.000	0.0445	0.000	0.4549	0.0000
Pseudo R2	0.0018	0.0375	0.0028	0.0454	0.008	0.0308
Pseudo Log likelihood	-2319.7	-2236.7	-2073.9	-1985.3	-1862.6	-1806.7

*Note *** Significant at P<0.001, **=p<0.01, *=p<0.05, and ‡= P<0.1*

4.3.4 The impact of parental migration on children's physical health across household wealth

It is also possible that impact of parental migration on children may be dissimilar across levels of poverty. Table 4.14 shows the multivariate models predicting illness for children of poor, middle class, and rich households. It is found that the impact of parental out-migration on the health of children was negative and significantly high among children in poorer households. The odds ratio has decreased but still remained significant after adding the individual, household, and community level characteristics. Interestingly, negative impacts of parental migration only show in poor households, but not in relatively better-off households. In poor household, children from migrant parents were more likely to have an illness (mother migrant: OR=1.49; father migrant: OR=1.64; and both- parent migrant: OR=1.17) than children living with both parent after controlling for other variables. It is notable that, if the household was not poor, there was no significant negative impact of parental migration on child health. Furthermore, younger children aged 0-4 and 5-9 in all types of household were more likely to have an illness than older children aged 10-14. With regard to ethnicity, Thai children of poor household were more likely to have an illness (OR=2.71) than non-Thai children of poor household. It is also notable that there was no significant association of having illness according to ethnicity (Thai vs. Non-Thai) among middle class, and rich households.

Large family size plays a protective role for illness experience among children of poor, and middle class wealth households. Furthermore, the negative impact of little remittances was seen among children of poor and middle class wealth households but not in rich households. Similarly children who were from poor households having debt were more likely to have illness (OR=1.27) than children from poor households but not having debt situation. Children of poor and middle class wealth households who drink water from shallow well or underground water were more likely to experience illness than children who drink water from tap. Children from poor and middle class wealth households and living in the village where bus route was available were less likely to have illness than their comparison group. However, bus route did not seem to be a significant predictor for children’s illness among children of rich household (Table 4.14).

Table 4.14 Multivariate models predicting illness in wealth status of households

	Poor		Middle		Rich	
	Model I	**Model II**	**Model I**	**Model II**	**Model I**	**Model II**
Parental migration status						
Non-migrant (ref.)	1.00	1.00	1.00	1.00	1.00	1.00
Mother-only migrant	1.93**	1.61*	0.86	0.95	1.84	1.08
Father-only migrant	2.02***	1.64**	1.01	1.01	1.03	1.04
Both-parent migrant	1.44*	1.17*	0.94	0.92	1.20	1.29
Children's Characteristics						
Age group						
0-4 Years		2.17***		2.46***		2.53***
5-9 years		1.45***		1.67***		1.45**
10-14 years (ref.)		1.00		1.00		1.00
Sex of the child						
Female (ref.)		1.00		1.00		1.00
Male		1.08		1.01		0.97
Ethnicity						
Non-Thai (ref.)		1.00		1.00		1.00
Thai		2.71***		1.28		1.08
Relationship with head of household						
Son/daughter (ref.)		1.00		1.00		1.00
Grand child		0.91		1.01		1.03
Nephew/niece		0.86		0.82		0.69
Others		0.80		0.88		0.92
Socio-economic characteristics of household						
Place of residence						
Urban (ref.)		1.00		1.00		1.00
Rural		0.83		1.20		0.87
Family size						
Up to 4 members (ref.)		1.00		1.00		1.00
5-7 members		0.75**		0.83*		0.82
8 or more members		0.73**		0.73**		0.90
Remittances						
No remittances/no migrant (ref.)		1.00		1.00		1.00
Less than 10,000		1.35**		1.35**		1.14
10,000-25000		1.31*		1.26*		0.85
More than 25,000		1.11		1.19		1.07

Table 4.14 Multivariate models predicting illness in wealth status of households (cont.)

	Poor		Middle		Rich	
	Model I	**Model II**	**Model I**	**Model II**	**Model I**	**Model II**
Household have debt						
No (ref.)		1.00		1.00		1.00
Yes		1.27**		1.01		1.15
Source of drinking water						
Tap water (ref.)		1.00		1.00		1.00
Rain water		1.66*		1.17		0.57
Shallow well		1.35*		1.42**		1.29
Under ground water		1.14*		1.26*		1.41
Toilet facility						
No (ref.)		1.00		1.00		1.00
Yes		1.11		0.49		0.67
Community characteristics						
Availability of bus route						
No (ref.)		1.00		1.00		1.00
Yes		0.65***		0.69***		0.66
Availability of health facility						
No (ref.)		1.00		1.00		1.00
Yes		1.25		1.04		1.09
Presence of school						
No (ref.)		1.00		1.00		1.00
Yes		1.02		0.88		0.86
Presence of factory						
No (ref.)		1.00		1.00		1.00
Yes		0.85*		1.11		1.03
# of observation	4493	4493	4499	4499	2249	2249
Wald Chi2	32.5	349.4	0.44	171.5	3.64	119.3
Prob>chi2	0.0000	0.000	0.9323	0.000	0.3026	0.000
Pseudo R2	0.068	0.0844	0.0001	0.0349	0.0015	0.0359
Pseudo Log likelihood	-2343.0	-2160.0	-2688.1	-2594.9	-1300.5	-1255.7

*Note *** Significant at P<0.001, **=p<0.01, *=p<0.05, and ‡= P<0.1*

CHAPTER V
PARENTAL INTERNATIONAL MIGRATION

This chapter presents the result from CHAMPSEA data, which addressed the two objectives of this thesis, i.e. to assess the impact of parental international migration on the psychological well-being and the physical health status of children left behind. This chapter includes descriptive results, bivariate, and multivariate analyses. Descriptive analysis presents parental migration status and characteristics of the children according to their individual, household, and caregiver's characteristics. Bivariate analysis presents an association between physical health and/or psychological well-being of children with parental migration status and other individual, household, and caregiver's characteristics. Finally, results from multivariate analysis which measures the strength of the association between various factors and the probabilities of having incidence of an illness (mental and physical) among children are presented.

5.1 Descriptive analysis

5.1.1 Parental migration status

CHAMPSEA project collected information from an equal proportion of migrant and non-migrants children. It is found that children left behind from international migration were more likely to have absent fathers than absent mothers in Thailand. For instance, among the children of migrant parents, an overwhelming majority of children had father migrants (93.6%). Migration of mother alone is very negligible (0.6%). Furthermore, one out of twenty children have both parents (father and mother) abroad (5.8%) (Data not shown).

CHAMPSEA not only identifies children based on their parents' current migration status, but also the experience of migration of their parents. Regarding the history of migration (any types of migration- either internal or international) of parents

since the child was born, more than two thirds of children's father (70.4%) had migration history while slightly more than one in ten children's mother (12.1%) had migration history (Table 5.1).

Of those 70 per cent with fathers ever migrated since the child was born, 38% had 3 or more years of migration experience since the child was born. Similarly, of 12% mother who had ever migrated since the child was born, seven per cent had more than one year of migration experience after the child was born. It is found that nearly all migrant fathers communicated with their children almost regularly. Of the 50% who were current migrants, 16% had communicated with their child daily while 17% had communicated weekly and remaining 18% migrants father had communicated to their left behind children less than once in a week.

Table 5.1 Parental migration status

Parental migration status	N	%
Parental migration (current)		
Non-migrant	511	49.8
Migrant	516	50.2
Father's has ever moved since the child was born		
No	304	29.6
Yes	723	70.4
Duration of father's migration since the child was born		
Never migrated after child was born	304	29.7
Less than 1 year	79	7.6
1-2 years	257	25.0
3 or more years	387	37.7
Mother's has ever moved since the child was born		
No	903	87.9
Yes	124	12.1
Duration of mother's migration since the child was born		
Never migrated after child was born	903	87.9
Less than 1 year	48	4.7
1-2 years	44	4.3
3 or more years	32	3.1
Communication with migrant parents		
Non-migrants	511	49.8
Less than once a week	185	18.0
Weekly	172	16.7
Daily	159	15.5
Total	1,027	100.0

5.1.2 Socio-demographic characteristics of children

Survey was designed to collect the equal number of younger and older children, and equal number of male and female. So the proportions of young (aged 3-5), and older children (aged 9-11) were about the same. Similarly, an equal proportion of children were male and female. Two out of five sampled children (40.2%) were in the first parity while one in ten children (10.3%) was in the third parity. Almost all older children aged 9-11 were currently schooling and had primary and below education (Table 5.2).

Table 5.2 Socio-demographic characteristics of children

Socio-demographic characteristics	N	%
Age of children		
Younger child (3-5 years)	508	49.5
Older child (9-11 years)	519	50.5
Sex of child		
Female	512	49.9
Male	515	50.1
Parity of the children		
One	400	40.2
Two	493	49.5
Three	102	10.3
Level of education		
No schooling (younger)	506	49.3
Primary or below	521	50.5
Total	1,027	100.0

5.1.3 Household characteristics

In this study, household characteristics included the variables such as family size, education and occupation of father and mother, remittances received from any family members, annual household saving, and household wealth. Average family size of the children's household was 4.3. More than two-thirds of the children (66.7%) had at least one sibling (sister/brother), and about half of the children had grandparent(s) in their households. As for parents' education, an overwhelming majority of children's father (88.4%), and mother (91.2%) had primary or above education. More than two in three fathers (67.5%) and about four fifths mother (83.4%) had engaged in domestic/agricultural sector.

All migrant households received remittances within 6 months period. Overall, about two thirds of the study children lived in the household (63%) that received remittances either money or goods within the last 6 months prior to survey from the people who were away from home (data not shown). Overall, nearly three in five children (57.7%) received money from the migrant family member in the last 6 months. It is notable that about one in five children's household (18.9%) received more than 120,000 Baht in the last six months. Nearly two in five households (37.6%) did not have saving while more than a fifth of household (23.4%) had more than

40,000 Baht as household saving. Household wealth index was constructed using PCA from possession of household durable goods and categorized into three groups; i.e. poor (2 bottom quintiles), middle (2 middle quintiles), and rich (5^{th} quintile) (Table 5.3).

Table 5.3 Demographic and socioeconomic characteristics of household

Demographic and socioeconomic characteristics	N	%
Family size		
Up to 3	313	30.5
4-5	538	52.4
6 or more	176	17.1
Average family size	***4.3***	
Sibling in the household		
No	343	33.4
Yes	684	66.6
Grandparents in the household		
No	531	51.7
Yes	496	48.3
Father's education level		
Below primary	119	11.6
Primary	842	82.0
Secondary or above	66	6.4
Father's occupation status		
Agricultural/domestic	693	67.5
Non-agricultural	334	32.5
Mother's education level		
Below primary	91	8.9
Primary	888	86.5
Secondary or above	48	4.7
Mother's occupation status		
Agricultural/domestic	857	83.4
Non-agricultural	170	16.6
Remittances in the past 6 months (in Baht)		
No migrant/no remittance	434	42.3
Less than 60,000	160	15.6
60,000-120,000	239	23.3
More than 120,000	194	18.9
Annual household saving (in Baht)		
No saving	372	37.6
Less than 20,000	246	24.8
20,000-40,000	140	14.1
More than 40,000	232	23.4
Household wealth status		
Poor	405	39.4
Middle	417	40.6
Rich	205	20.0
Total	1,027	100.0

5.1.4 Characteristics of caregivers

CHAMPSEA study also collected the socio-demographic, and health information of a primary caregiver of children. The mean age of caregivers was 35.7 years, with about a fifth (17.2%) aged less than 30 years. A high majority of the children (95.3%) were cared for by their own biological parents (mother). About three-fifths of the caregivers (61.2%) spent less than 6 hours a day caring for their children. Psychological well-being of primary caregivers was measured by using the self reporting questionnaire 20 (SRQ-20). The questionnaire includes incidence of illness such as lack of sound sleep, easily frightened, nervousness, poor digestion, cry more than usual, lack of interest in things, feeling of tiredness at all times etc. The standard cut off of these symptoms is 7/8. When applying the cut-off of 8 items, it is found that nearly four out of five caregivers (78.9%) were psychologically healthy (i.e. experienced less than 8 symptoms) while remaining one fifth (21.1%) caregivers unhealthy psychological well-being (i.e. experienced 8 or more symptoms) (Table 5.4).

Table 5.4 Characteristics of caregivers

Characteristics of caregivers	**N**	**%**
Age		
Less than 30 years	177	17.2
30-39 years	578	56.3
40 years or more	272	26.5
Mean age of caregivers	***35.7 years***	
Types		
Biological parents	979	95.3
Grandparents/other	48	4.7
Hours spend in caring for children		
Less than 6 hours	629	61.2
6 and over hours	398	38.8
Psychological well-being		
Healthy psychological well-being	810	78.9
Mentally Unhealthy psychological well-being	217	21.1
Total	1,027	100.0

5.1.5 Psychological well-being of children

As mentioned in the method section, to measure psychological well-being of children, a total difficulty score (Strength and Difficulty Question: SDQ) was calculated as the sum of scores of the conduct, hyperactivity, emotional, and peer problems scales, and categorized (normal, borderline, and abnormal) according to Thai version of SDQ. This study found that about three out of four children (73.5%) had healthy psychological well-being, while 13.6 per cent children were at borderline. It is notable that more than a tenth of children had poor psychological well-being (i.e., 12.9% scored abnormal in total difficulties score). Abnormality varied with different sub scales. For instance, one in five children (20.4%) had hyperactivity problems, about one in six (15.7%) had conduct problems, one in twenty had emotional (5.2%) and peer problems (4.4%), and more than a tenth exhibited pro-social behavior (12.9%) (Table 5.5).

Table 5.5 Emotional and behavioral problems

Emotional and behavioral problems	N	%
Emotional symptoms score		
Normal (0-4)	903	87.9
Borderline (5)	71	6.9
Abnormal (6-10)	53	5.2
Conduct problem score		
Normal(0-3)	734	71.5
Borderline (4)	132	12.9
Abnormal (5-10)	161	15.7
Hyperactivity score		
Normal(0-5)	660	64.3
Borderline (6)	158	15.4
Abnormal (7-10)	209	20.4
Peer problem score		
Normal(0-4)	878	85.5
Borderline (5)	104	10.1
Abnormal (6-10)	45	4.4
Pro social behavior score		
Normal(5-10)	891	86.8
Abnormal (0-4)	136	13.2
Total difficulties score		
Normal (0-15)	755	73.5
Borderline (16-18)	140	13.6
Abnormal (19-40)	132	12.9
Total	1,027	100.0

5.1.6 Physical health of children

Physical health status of children was measured by illness (cold, cough, fever, flu, stomachache, diarrhea, or eye problems within the previous two weeks prior to the survey), and nutritional status of children- stunting, overweight and thinness.

A substantial proportion of children (40.1%) suffered cold, cough, fever, and flu within the previous two weeks. Similarly, more than one in five children suffered from stomachache (21.2%). In addition to this, one in twenty-five children had diarrhea (6%) and eye problem (4.3%) within the two weeks prior to the survey. Notably, more than a half (53.0%) of children had illness within the last two weeks prior to the survey. Other way of examining the impacts of migration on the physical well-being of left-behind children is by looking at their anthropometric measurements.

Under nutritional status placed children at an increased risk of physical and mental morbidity. The study found that more than a tenth of the study children were over-weight (13.3%), and about a tenth study children were stunted (8.1%), and thin (8.2%) (Table 5.6).

Table 5.6 Current illness and nutritional status of children

Current illness and nutritional status	N	%
Illness in the past 2 weeks		
Cold, cough, fever, flu		
No	615	59.9
Yes	412	40.1
Stomach ache		
No	809	78.8
Yes	218	21.2
Diarrhea		
No	965	94.0
Yes	62	6.0
Eye problem		
No	983	95.7
Yes	44	4.3
Having at least one symptom of Illness		
No	483	47.0
Yes	544	53.0
Total	1,027	100.0
Nutritional status		
Stunting		
No	925	91.9
Yes	81	8.1
Overweight		
No	874	86.7
Yes	134	13.3
Thinness		
No	926	91.8
Yes	83	8.2
Total	1,009	100.0

5.2 Bivariate analysis

5.2.1 Correlates with psychological well-being of children

5.2.1.1 Psychological well-being of children and parental migration status

As mentioned earlier, more than a tenth of children (12.9%) had poor psychological well-being. No significant differences were found in emotional symptoms, peer problems, and pro-social behavior scores among children and whether or not they had migrant parents. However, children left behind did have a higher conduct problems score (18.2%) than non-left-behind children (13.1%). Similarly, a higher proportion of children left behind had an abnormal hyperactivity score (23.8%) than did non-left-behind children (16.8%). With regard to total difficulty score, slightly higher proportion of children left behind had poor psychological well-being (14.7%) than did non-left-behind children (11.0%). However, the association was not statistically significant (Table 5.7).

Table 5.7 Emotional and behavioral problems by parental migration

Emotional and behavioral problems	Parental migration		Total	
	Non-migrant	Migrant	%	N
Emotional symptoms score				
Normal (0-4)	88.5	87.4	87.9	903
Borderline (5)	5.9	7.9	6.9	71
Abnormal (6-10)	5.7	4.7	5.2	53
Conduct problem score**				
Normal (0-3)	74.4	68.6	71.5	734
Borderline (4)	12.5	13.2	12.9	132
Abnormal (5-10)	13.1	18.2	15.7	161
Hyperactivity score**				
Normal (0-5)	68.9	59.7	64.3	660
Borderline (6)	14.3	16.5	15.4	158
Abnormal (7-10)	16.8	23.8	20.4	209
Peer problem score				
Normal (0-4)	84.7	86.2	85.5	878
Borderline (5)	10.4	9.9	10.1	104
Abnormal (6-10)	4.9	3.9	4.4	45
Pro social behavior score				
Normal (5-10)	87.5	86.0	86.8	891
Abnormal (0-4)	12.5	14.0	13.2	136
Total difficulties score				
Normal (0-15)	75.7	71.3	73.5	755
Borderline (16-18)	13.3	14.0	13.6	140
Abnormal (19-40)	11.0	14.7	12.9	132
Total	100.0	100.0	100.0	1,027

*Note ** Significant at Chi-square test p<0.01*

Based on total difficulty score of SDQ, more than one in ten children have poor psychological well-being; i.e. abnormal situation in psychological well-being (12.9%). Children whose parents were currently migrant or/and whose parents had migration history since they were born had more psychological problem than those whose parents had not migration history. For instance, 15 per cent of children in migrant households had poor psychological well-being while it was 11 per cent to children living with both parents. Similarly, a slightly higher proportion of children whose father had a migration history (13.4%) than those whose father did not have migration history had poor psychological well-being. However, the differences were not statistically significant. On the other hand, a higher proportion of children whose

mother had a migration history (23.4%) had poor psychological well-being than those children whose mother did not have migration experience after a sampled child was born (11.4%). Chi-square test shows a significant association between mother's ever being absent since child was born and children's psychological well-being. Likewise, a higher proportion of children whose fathers migrated about 1-2 years (18.3%) had poorer psychological well-being. Similarly, a higher proportion of children had poorer psychological well-being whose mother had migrated less than one year (29.2%) after the sampled child was born (Table 5.8).

Table 5.8 Psychological well-being of children by parental migration history, duration of migration, and communication with migrant parents

Parental migration status	Psychological well-being			Total	
	Normal	Borderline	Abnormal	%	N
Father's has ever moved since the child was born					
No	74.3	14.1	11.5	100.0	304
Yes	73.2	13.4	13.4	100.0	723
Total duration of father's migration since the child was born**					
Never migrated after child was born	74.3	14.1	11.5	100.0	304
Less than 1 year	73.1	10.3	16.7	100.0	79
1-2 years	67.3	14.4	18.3	100.0	257
3 or more years	77.0	13.4	9.6	100.0	387
Mother's has ever moved since the child was born***					
No	75.6	13.0	11.4	100.0	903
Yes	58.1	18.5	23.4	100.0	124
Total duration of mother's migration since the child was born***					
Never migrated after child was born	75.6	13.0	11.4	100.0	903
Less than 1 year	54.2	16.7	29.2	100.0	48
1-2 years	52.3	27.3	20.5	100.0	44
3 or more years	71.9	9.4	18.8	100.0	32
Communication with migrant parents (father)					
Non-migrants	75.7	13.3	11.0	100.0	511
Less than once a week	75.1	11.9	13.0	100.0	185
Weekly	68.0	14.5	17.4	100.0	172
Daily	70.4	15.7	13.8	100.0	159
Total	73.5	13.6	12.9	100.0	1,027

*Note *** Significant at Chi-square test P<0.001, **=p<0.01*

5.2.1.2 Psychological well-being of children and socio-demographic characteristics

Psychological well-being varied with characteristic of children such as their age, parity, and level of education. A higher proportion of children who were younger (aged 3-5) had psychological problem (18.3%) than older children aged

9-11 (7.5%). Psychological problem was higher among those who were born in first parity (16.8%) than those who were born in second (9.7%) or third (9.8%) parities. Almost all older children had primary or below education and they had better psychological health than those children who were younger and not at the schooling age. However, psychological well-being did not vary across genders of the children (Table 5.9).

Table 5.9 Psychological well-being of children by socio-demographic characteristics

Socio-demographic characteristics	Psychological well-being			Total	
	Normal	Borderline	Abnormal	%	N
Age of children* **					
Younger child	65.2	16.5	18.3	100.0	508
Older child	81.7	10.8	7.5	100.0	519
Sex of child					
Female	75.4	12.3	12.3	100.0	512
Male	71.7	15.0	13.4	100.0	515
Parity of the children*					
One	71.0	12.3	16.8	100.0	400
Two	76.9	13.4	9.7	100.0	493
Three	74.5	15.7	9.8	100.0	102
Level of education* **					
No schooling (younger)	65.1	16.6	18.3	100.0	507
Primary or below	81.7	10.8	7.5	100.0	520
Total	73.5	13.6	12.9	100.0	1,027

*Note *** Significant at Chi-square test P<0.001, and *=p<0.05*

5.2.1.3 Psychological well-being of children and household-level characteristics

The association between children's psychological well-being and household characteristics was examined. In this study, four household level variables, i.e. sibling of children, fathers and mother's occupation status, and household wealth status were significantly associated with psychological well-being of children. For instance, significantly lower percentage of those children who had at least one sibling (10.8%) had poor psychological well-being than those who did not have any sibling (16.9%). Similarly, significantly lower proportion of children whose father worked on agricultural/domestic sector had poor psychological well-being

(11.4%) than those whose father worked in non-agricultural sector (15.9%). On contrary to this, children of mother who worked in agricultural/domestic sector had higher psychological problem (14%) than children of women who worked in non-agricultural sector (7.1%). It is notable that significantly lower percentage of children from rich household had psychological problem (10.2%) than children from poor households (14.3%) (Table 5.10).

Table 5.10 Psychological well-being of children by household-level characteristics

Demographic and socioeconomic characteristics of household	Psychological well-being			Total	
	Normal	Borderline	Abnormal	%	N
Family size					
Up to 3	74.1	13.4	12.5	100.0	313
4-5	72.3	14.5	13.2	100.0	538
6 or more	76.1	11.4	12.5	100.0	176
Sibling in the household*					
No	68.5	14.6	16.9	100.0	343
Yes	76.0	13.2	10.8	100.0	684
Grandparents in the household					
No	74.4	13.6	12.1	100.0	531
Yes	72.6	13.7	13.7	100.0	496
Father's education level					
Below primary	71.4	15.1	13.4	100.0	119
Primary	74.0	13.5	12.5	100.0	842
Secondary or above	71.2	12.1	16.7	100.0	66
Father's occupation status *					
Agricultural/domestic	73.3	15.3	11.4	100.0	693
Non-Agricultural	74.0	10.2	15.9	100.0	334
Mother's education level					
Below primary	69.2	16.5	14.3	100.0	91
Primary	74.0	13.6	12.4	100.0	888
Secondary or above	72.9	8.3	18.8	100.0	48
Mother's occupation status*					
Agricultural/domestic	72.3	13.1	14.0	100.0	857
Non-agricultural	79.4	13.5	7.1	100.0	170
Remittances in the past 6 months (in Baht)					
No/no migrant	75.8	13.6	10.6	100.0	434
Less than 60,000	70.6	15.6	13.8	100.0	160
60,000-120,000	72.8	12.1	15.1	100.0	239
More than 120,000	71.6	13.9	14.4	100.0	194
Annual household saving (in Baht)					
No saving	69.6	15.9	14.5	100.0	372
Less than 20,000	73.6	14.6	11.8	100.0	246
20,000-40,000	75.7	9.3	15.0	100.0	140
More than 40,000	75.9	12.9	11.2	100.0	232
Household wealth status **					
Poor	67.9	17.8	14.3	100.0	405
Middle	75.3	12.0	12.7	100.0	417
Rich	81.0	8.8	10.2	100.0	205
Total	73.5	13.6	12.9	100.0	1,027

*Note *** Significant at Chi-square test P<0.001, **p=<0.01, *=p<0.05*

5.2.1.4 Psychological well-being of children and caregiver's characteristics

Caregiver's characteristics such as age, types, and psychological well-being had a significant association with children's psychological well-being. For instance, children who were cared for by the caregivers aged 40 years or over had better psychological health (abnormal score 9.6%) than did children who were looked after by caregivers aged less than 30 years (abnormal 24.3%). Similarly, children who were cared for by their own parents (mother) had significant lower psychological problems (12.5%) than those children who were cared for by grandparents or others (20.8%). Interestingly, children who were cared for by psychologically healthy caregivers had better psychological well-being/mental health (abnormal score 10.1%) than did children who were cared for by psychologically unhealthy caregivers (abnormal score 23%) ($p<0.001$). This study did not find a significant association in chi-square test between hours spent in caring for children and psychological well-being of children (Table 5.11).

Table 5.11 Psychological well-being of children by characteristics of caregivers

Characteristics of caregivers	Psychological well-being			Total	
	Normal	Borderline	Abnormal	%	N
Age ***					
Less than 30 years	62.7	13.0	24.3	100.0	177
30-39 years	75.8	13.3	10.9	100.0	578
40 years or more	75.7	14.7	9.6	100.0	272
Types *					
Biological parents	74.3	13.3	12.5	100.0	979
Grandparents/other	58.3	20.8	20.8	100.0	48
Hours spent in caring for child					
Less than 6 hours	74.6	14.1	11.3	100.0	629
6 hours and over	71.9	12.8	15.3	100.0	398
Psychological well-being ***					
Healthy	77.5	12.3	10.1	100.0	810
Unhealthy	58.5	18.4	23.0	100.0	217
Total	73.5	13.6	12.9	100.0	1,027

*Note *** Significant at Chi-square test P<0.001, **=p<0.01 and *=p<0.05*

5.2.1.5 Psychological well-being of children and physical health

It was found that incidence of physical illness was highly associated with psychological well-being of children. A significantly higher proportion of children (17.5%) who had an illness had poor psychological health. On the other hand, the proportion of having psychological problem was low (7.7%) among children with good physical health (no incidence of illness). This study analyzed nutritional status of children and psychological health status. Chi-square test showed that there was no significant association between nutritional status (stunted, overweight, and thinness) and psychological well-being of children (Table 5. 12).

Table 5.12 Psychological well-being of children by nutritional status and children's illness

Nutritional status and incidence of illness	Psychological well-being			Total	
	Normal	Borderline	Abnormal	%	N
Stunting					
No	74.2	13.3	12.5	100.0	946
Yes	71.6	16.0	12.3	100.0	81
Overweight					
No	73.7	14.1	12.2	100.0	874
Yes	76.1	9.7	14.2	100.0	134
Thin					
No	74.3	13.1	12.6	100.0	926
Yes	69.9	18.1	12.0	100.0	83
Incidence of current Illness ***					
No	81.0	11.4	7.7	100.0	483
Yes	66.9	15.6	17.5	100.0	544
Total	73.5	13.6	12.9	100.0	1,027

*Note *** Significant at Chi-square test P<0.001*

5.2.2 Correlates with incidence of children's illness

5.2.2.1 Incidence of children' illness and parental migration status

As mentioned earlier, physical health status of children were measured by having any current illness symptoms such as cold, cough, flu, fever, stomachache, diarrhea, and eye problems. Current illness among children did not vary across different characteristics of children. Only one variable related to parental migration status, i.e. duration of father migration since the child was born had a significant association with children's illness. A lower proportion of children of migrant father who had migrated for 3 or more years (46.8%) had an illness than children of those fathers who did not have migration experiences or who had less than 3 years migration experience after a sampled child was born (Table 5.13).

Table 5.13 Incidence of children's illness by parental migration status

Parental migration status	Incidence of illness		Total	
	No	Yes	%	N
Parental migration (current)				
Non-migrant	45.4	54.6	100.0	511
Migrant	48.6	51.4	100.0	516
Father's has ever moved since the child was born				
No	44.1	55.9	100.0	304
Yes	48.3	51.7	100.0	723
Total duration of father's migration since the child was born*				
Never migrated after child was born	44.3	55.7	100.0	305
Less than 1 year	47.4	52.6	100.0	78
1-2 years	40.9	59.1	100.0	257
3 or more years	53.2	46.8	100.0	387
Mother's has ever moved since the child was born				
No	46.2	53.8	100.0	903
Yes	53.2	46.8	100.0	124
Total duration of mother's migration since the child was born				
Never migrated after child was born	46.2	53.8	100.0	903
Less than 1 year	54.2	45.8	100.0	48
1-2 years	45.5	54.5	100.0	44
3 or more years	62.5	37.5	100.0	32
Communication with migrant parents				
Non-migrants	45.4	54.6	100.0	511
Less than once a week	51.4	48.6	100.0	185
Weekly	47.7	52.3	100.0	172
Daily	46.5	53.5	100.0	159
Total	47.0	53.0	100.0	1,027

*Note * Significant at Chi-square test P<0.05*

5.2.2.2 Incidence of children's illness and socio-demographic characteristics

Children's illness varied with children's characteristics. For instance, a significantly higher percentage of younger children aged 3-5 years had physical health problems (58.1%) than older children aged 11-13 (48.0%). Similarly, those children who had primary or below education had significantly lower illness (47.9%) than children who had pre-elementary school education (58.2%). Chi-square

test showed no significant association between the variables such as sex of children and parity of children with illness (Table 5.14).

Table 5.14 Incidence of children's illness by socio-demographic characteristics

Socio-demographic characteristics	Incidence of illness		Total	
	No	Yes	%	N
Age of children ***				
Younger child	41.9	58.1	100.0	508
Older child	52.0	48.0	100.0	519
Sex of child				
Female	46.9	53.1	100.0	512
Male	47.2	52.8	100.0	515
Parity of the children				
One	43.8	56.3	100.0	400
Two	49.5	50.5	100.0	493
Three	49.0	51.0	100.0	102
Level of education**				
No schooling (younger)	41.8	58.2	100.0	507
Below primary	52.1	47.9	100.0	520
Total	47.0	53.0	100.0	1,027

*Note *** Significant at Chi-square test P<0.001, and **=p<0.01*

5.2.2.3 Incidence of children's illness and household-level characteristics

As mentioned earlier, this study analyzed the household level variables such as family size, having a sibling, having grandparents in the household, education of father and mother, occupation of father and mother, remittances received in the past 6 months, annual household saving, and household wealth status. This study found that having at least one sibling and education of mothers were significant with children's illness. Having sibling seems good for both mental and physical health of children. Significantly lower percentages of children who have at least one sibling (49.1%) had an illness than those who did not have any sibling (60.6%). Lower incidence of illness was found among children whose mothers had primary education (51.4%) than those children who had mothers with below primary (63.7%) or secondary or above (62.5%) education.

However, chi-square test showed that there was no significant difference between current illness and other household level variables such as family size, education and occupation of father, occupation of mother, having grandparents in the household, remittance, annual household saving, and household wealth status (Table 5.15).

Table 5.15 Incidence of children's illness by demographic and socio-economic characteristics of household

Demographic and socio-economic characteristics of household	Incidence of illness		Total	
	No	Yes	%	N
Family size				
Up to 3	43.8	56.2	100.0	313
4-5	49.3	50.7	100.0	538
6 or more	46.0	54.0	100.0	176
Sibling in the household ***				
No	39.4	60.6	100.0	343
Yes	50.9	49.1	100.0	684
Grandparents in the household				
No	47.5	52.5	100.0	531
Yes	46.6	53.4	100.0	496
Father's education level				
Below primary	42.0	58.0	100.0	119
Primary	48.2	51.8	100.0	842
Secondary or above	40.9	59.1	100.0	66
Father's occupation status				
Agricultural/domestic	48.8	51.2	100.0	693
Non-agricultural	43.4	56.6	100.0	334
Mother's education level *				
Below primary	36.3	63.7	100.0	91
Primary	48.6	51.4	100.0	888
Secondary or above	37.5	62.5	100.0	48
Mother's occupation status				
Agricultural/domestic	48.3	51.7	100.0	857
Non-agricultural	40.6	59.4	100.0	170
Remittances in the past 6 months (in Baht)				
No remittances/no migrant	45.4	54.6	100.0	434
Less than 60,000	43.8	56.3	100.0	160
60,000-120,000	47.3	52.7	100.0	239
More than 120,000	53.1	46.9	100.0	194
Annual household saving (in Baht)				
No saving	44.1	55.9	100.0	372
Less than 20,000	50.8	49.2	100.0	246
20,000-40,000	50.0	50.0	100.0	140
More than 40,000	46.6	53.4	100.0	232
Household wealth status				
Poor	46.2	53.8	100.0	405
Middle	48.7	51.3	100.0	417
Rich	45.4	54.6	100.0	205
Total	47.0	53.0	100.0	1,027

*Note *** Significant at Chi-square test p<0.001, and *=p<0.05*

5.2.2.4 Incidence of children's illness and caregiver's characteristics

This study also examined the association between caregiver's characteristics and children's illness. Analysis of chi-square test found that psychological well-being of caregivers had significant association with children's illness. Significantly lower percentage of children (49.1%) who were cared for by the psychologically healthy caregivers had an illness than those who were cared for by psychologically unhealthy caregivers (67.3%).

Chi-square test showed that there was no significant association between children's illness and other variables such as age of caregivers, types of caregivers, and hours spent in caring for children.

Table 5.16 Incidence of children's illness by characteristics of caregivers

Characteristics of caregivers	Incidence of illness		Total	
	No	Yes	%	N
Age				
Less than 30 years	40.7	59.3	100.0	177
30-39 years	48.8	51.2	100.0	578
40 years or more	47.4	52.6	100.0	272
Types				
Biological parents	47.0	53.0	100.0	979
Grandparents/other	47.9	52.1	100.0	48
Hours spent in caring for children				
Less than 6 hours	49.3	50.7	100.0	629
6 hours and over	43.5	56.5	100.0	398
Psychological well-being ***				
Healthy	50.9	49.1	100.0	810
Unhealthy	32.7	67.3	100.0	217
Total	47.0	53.0	100.0	1,027

*Note *** Significant at Chi-square test P <0.001, and **=p<0.01*

5.2.2.5 Incidence of children's illness and psychological well-being and nutritional status

This study found significantly lower percentages of children (48.2%) with good psychological well-being (normal) have an illness. On the other hand, physical illness was very high (72.0%) among those children who had poor psychological well-being (abnormal). Furthermore, chi-square test did not find any significant association between children's illness and nutritional status (stunting, overweight, thinness) (Table 5.17).

Table 5.17 Incidence of children's illness by psychological well-being and nutritional status of children

Psychological well-being and nutritional status	Incidence of illness		Total	
	No	Yes	%	N
Psychological well-being ***				
Normal	51.8	48.2	100.0	755
Borderline	39.3	60.7	100.0	140
Abnormal	28.0	72.0	100.0	132
Total	47.0	53.0	100.0	1,027
Nutritional status				
Stunting				
No	47.2	52.8	100.0	925
Yes	44.4	55.6	100.0	81
Overweight				
No	46.7	53.3	100.0	874
Yes	49.3	50.7	100.0	134
Thin				
No	47.8	52.2	100.0	926
Yes	38.6	61.4	100.0	83
Total	47.1	52.9	100.0	1,009

*Note *** Significant at Chi-square test P<0.001*

5.3 Multivariate analysis

5.3.1 Psychological well-being of children

5.3.1.1 The impact of parental migration on the psychological well-being of children

Logistic regression analysis was used to measure the strength of the association between various factors and the probabilities of having psychological problem of children. Before analyzing the data via logistic regression, multicollinearity among variables were assessed. After assessing multicollinearity among the variables, it was found that "age of children" and "level of education" was highly correlated (r=0.88). Therefore, the variables “level of education” was not entered in the logistic regression model. Furthermore, parental migration, histories of father and mother migration were highly correlated with duration of father and mother migration. Variables such as parental migration, histories of father, and mother migration also highly correlated with communication with children. Therefore, separate logistic models were fitted to analyze these variables.

Four logistic regression models have been used in the analysis. The first model contained variables related to parental migration status as the main independent variable and poor psychological well-being (abnormal=1; normal/borderline=0) of children as the dependent variable. In the second model, children characteristics such as age, sex, incidence of physical illness, and nutritional status (stunting, overweight, and thinness) were added. In the third model, demographic and socio-economic characteristics of household such as family size, sibling, parents’ education and occupation status, remittance, annual household savings, and household wealth status were included. In the fourth model, caregiver’s characteristics such as age, types of caregiver, hours spent in caring for children, and psychological well-being of the caregivers were added to examine the net effect of parental migration status on health of children after controlling for the children’s characteristics, demographic and socio-economic characteristics of household, and caregiver’s characteristics.

In the first model, mother’s migration history ($p<0.01$) had a significant association with psychological well-being of children. Children of migrant parents

were more likely to have poor psychological well-being (OR=1.61, p<0.1) than were children from non-migrant parents. Similarly, children whose mothers had migration history since the child was born were more likely to have poor (OR=2.43, p<0.001) psychological well-being than those children whose mother had not migrated since the child was born.

In the second model, parent's current migration variable lost its significance level after adding children's characteristics in the model. However, the variable 'mother's migration history' retained its significance level. The loss of significance level of parent's current migration status and reduced odds ratio of the variables 'mother's migration history' after adding characteristics of children indicates that children characteristics were also important to predict the psychological well-being of children and explain the effects of parents' current migration status. Furthermore, in the second model, age of children, parity of children, and incidence of physical illness of children had significant association with psychological well-being.

When the demographic and socioeconomic characteristics were added in the third model, mother's migration history, age of children, parity of the children, and incidence of physical illness retained their significance level. Furthermore, in this model, two household level characteristics such as father and mother's occupation had significant association with psychological well-being of children. Mothers working in the non-agricultural sectors (OR=0.26, p<0.001) showed lower probability of having psychological problem among children. Contrary to this, children whose father worked in non-agricultural sectors were more likely to have psychological problem (OR=1.74, p<0.05) than those children whose father worked in agricultural/domestic sectors. When caregivers' characteristics were added in the fourth, last model, mother's migration history, age of children, incidence of physical illness, father and mothers' occupation retained their significance level. However, parity of children which had significant association in the second and third models lost its significance level after adding caregivers' characteristics. Furthermore, in this model, age of caregivers, and psychological well-being of the caregivers were statistically significant with psychological well-being of children.

In the final model, several factors, such as mother's migration history, age of children (younger vs. older), incidence of physical illness, occupation of both

parents (father and mother), age of caregivers, and caregivers' psychological well-being, had a statistically significant association with psychological well-being of children. Results showed that mother's migration history resulted in significantly poorer psychological well-being of children at 0.01 significance levels. To be more precise, children whose mothers had migrated after they were born showed a higher risk of having psychological problems (OR=2.04) as compared with those whose mothers had never migrated.

The odds ratio of older children reflected a significantly (OR=0.37; $p<0.001$) lower occurrence of psychological problems compared with that of younger children. Regarding the relation with physical illness, poor physical health is positively associated with the poor psychological well-being. For instance, those children who had poor physical health were also more likely to have poor psychological well-being (OR=2.36; $p<0.001$).

Children of fathers who worked in non-agricultural sectors had higher likelihood of having psychological problem (OR=1.76) than did children of those fathers who worked in agricultural/domestic sector. On the other hand, the study found the opposite direction for mother's occupation. Children whose mothers worked in non-agricultural sectors were less likely to have psychological problem (OR=0.27) than children whose mother worked in agricultural/domestic sectors.

Similarly, those children who had older caregivers (aged 30-39, and 40 or above) were likely to have fewer psychological problems (OR=0.55 for caregivers aged 30-39, and OR=0.46 for caregivers aged 40 or more) than were children who had younger caregivers (aged less than 30 years). Furthermore, those children who were cared for by psychologically unhealthy caregivers were more likely (OR=2.52) to have higher psychological problems than were those who cared for by psychologically healthy caregivers.

Table 5.18 Odds ratios (OR) for having psychological problem among children

Predictors	Models			
	I	II	III	IV
Parental migration status				
Parental migration (current)				
Non-migrant (ref.)				
Migrant	1.61‡	1.42	1.03	1.15
Father's has ever moved since the child was born				
No (ref.)				
Yes	0.71	0.91	1.08	1.02
Mother's has ever moved since the child was born				
No (ref.)				
Yes	2.43** *	2.26**	1.97*	2.04*
Characteristic of children				
Age of children				
Younger child (ref.)				
Older child		0.36***	0.32***	0.37***
Sex of child				
Female (ref.)				
Male		1.16	1.18	1.19
Parity of the children				
One (ref.)				
Two		0.58*	0.59*	0.67
Three		0.55*	0.44*	0.57
Incidence of physical illness				
No (ref.)				
Yes		2.58***	2.69***	2.36***
Stunting				
No (ref.)				
Yes		1.01	0.86	0.93
Overweight				
No (ref.)				
Yes		1.46	1.69	1.57
Thin				
No (ref.)				
Yes		0.99	1.02	0.97
Demographic and socio-economic conditions of HH				
Family size				
Up to 3 (ref.)				
4-5 members			1.78	1.71
6 or more members			2.36	2.16

Table 5.18 Odds ratios (OR) for having psychological problem among children (cont.)

Predictors	Models			
	I	II	III	IV
Sibling in the household				
No (ref.)				
Yes			0.68	0.69
Grandparents in the household				
No (ref.)				
Yes			0.58	0.59
Father's education level				
Below primary (ref.)				
Primary			0.74	0.69
Secondary or above			1.10	0.91
Father's occupation status				
Agricultural/domestic (ref.)				
Non-agricultural			1.74*	1.76*
Mother's education level				
Below primary (ref.)				
Primary			0.71	0.71
Secondary or above			0.99	1.05
Mother's occupation status				
Agricultural/domestic (ref.)				
Non-agricultural			0.26***	0.27**
Remittances in the past 6 months (in Baht)				
No remittances/no migrant (ref.)				
Less than 60,000			1.22	1.14
60,000-120,000			1.74	1.48
More than 120,000			1.73	1.53
Annual household saving (in Baht)				
No saving (ref.)				
Less than 20,000			0.85	0.85
20,000-40,000			0.95	1.02
More than 40,000			0.63	0.72
Household wealth status				
Poor (ref.)				
Middle			0.93	1.06
Rich			0.79	0.98

Table 5.18 Odds ratios (OR) for having psychological problem among children (cont.)

Predictors	Models			
	I	II	III	IV
Characteristics of caregivers				
Age				
Less than 30 years (ref.)				
30-39 years				0.55*
40 years or above				0.46*
Types				
Biological parents (ref.)				
Grandparents/other				0.95
Hours spent in caring for children				
Less than 6 hours (ref.)				
6 hours and over				1.11
Psychological well-being				
Healthy (ref.)				
Unhealthy				2.52***
Constant	*0.127***	*0.11****	*0.20***	*0.23**
-2 Log likelihood	*772.4*	*685.4*	*655.5*	*634.5*
Cox and Snell R-square	*0.015*	*0.070*	*0.097*	*0.116*

*Note *** Significant at P<0.001, **=p<0.01, *=p<0.05, and ‡= P<0.1*

Many studies found that the variables such as duration of migration of the mother and father and communication between migrants' parents and children have an association with well-being of children. As mentioned earlier, these variables (the duration of father, mother migration, communication with migrant parents) have high correlation with current migration status, and migration histories of father and mother. So the effects of these variables on the psychological well-being of children were examined separately.

Without controlling any other variables such as children characteristics, socio-economic characteristics of household, and caregiver characteristics, the study found that duration of migration of father, and duration of migration of mother had significant association with psychological well-being of children. It is notable that those fathers who migrated 3 or more years after the child was born were less likely to have psychological problem (OR=0.42) than children of non-migrants parents. Furthermore, children whose mother migrated less than one year after the child was born have higher risk for having psychological problem (OR=3.33) than those children

whose mother had not migrated since the child was born. However, the analysis did not show any association with communication with children and migrants' parents, and psychological well-being of children left behind. The effect of duration of mother's migration remained same after controlling children characteristics. However, the effect of duration of fathers' migration since the child was born lost its significance level after adding children characteristics in the model. When the variables of caregiver characteristics were added, duration of mother' migration also lost its significance level which indicates that caregiver's characteristics are also important predictors for having psychological problems. None of these variables such as duration of father's and mother's migration, and communication of migrants' parents showed significance association after controlling the characteristics of children, demographic and socio economic status of household, and caregiver characteristics.

Table 5.19 Odds ratios (OR) for the effect of duration of parental migration and communication with migrant parents on psychological well-being of children

	Models			
	I	**II**	**III**	**IV**
Total duration of father's migration since the child was born				
Non-migrant (ref.)	1.00	1.00	1.00	1.00
Less than 1 year	0.90	1.09	1.24	1.06
1-2 years	0.96	1.02	1.19	1.19
3 or more years	0.42*	0.64	0.76	0.72
Total duration of mother's migration since the child was born				
No (ref.)	1.00	1.00	1.00	1.00
Less than 1 year	3.33**	3.06**	2.25*	2.20
1-2 years	2.16	1.72	1.81	1.97
3 or more years	2.55	2.66	2.31	2.57
Communication with migrant parents				
Non-migrants	0.59	0.72	0.93	0.88
Less than once a week	0.89	0.98	0.94	1.04
Weekly	1.38	1.39	1.31	1.27
Daily (ref.)	1.00	1.00	1.00	1.00
Constant	*0.21****	*0.15****	*0.22*	*0.26*
-2 Log likelihood	*755.9*	*678.7*	*651.0*	*630.2*
Cox and Snell R-square	*0.031*	*0.076*	*0.101*	*0.120*

*Note *** Significant at P<0.001, **=p<0.01, and *=p<0.05*

Note: Model 1 fitted without controlling any variable; Model 2 was fitted after controlling children characteristics (age of children, sex, parity, incidence of illness, stunting, overweight and thinness). Model 3 controlled all the variables which were controlled in model 2 and socio-economic conditions of Household (family size, having sibling, having grandparents, father and mother's education and occupation, remittance, annual household saving and wealth); model 4 was fitted after controlling all variables which were controlled in model 3 and characteristics of caregivers (age of caregiver, types of caregiver, hours spending in caring for children and psychological well-being of caregiver).

5.3.1.2 The impact of parental migration on the psychological well-being of children across sex of children

As analyzed in chapter 5, in this chapter also, both univariate and multivariate models were fitted. The result in univariate model describes the gross effect; while the result in multivariate model describes the net effect, that is, the effect of parental migration after controlling for the effect of other variables in the model. In the first model, parental current migration status, and father migration history did not have an effect on poor psychological well-being among both male and female children. On the other hand, mother's migration history showed negative impact on psychological well-being of both male and female children in the first model which showed the result without controlling for any other children, household, and community characteristics. When the children, household, and caregiver's characteristics were added, the significant level for male children disappeared which means that there was no significant negative impact of parental migration on the psychological well-being of male children when other variables were controlled. However, impact of mother's migration experience remained significant even after inclusion of other variables in the model. It is found that female children of mothers who had migration history after a child was born, were more likely to have psychological problem (OR=2.4) than did female children of mother who did not have migration experience after they born.

In addition to this, older children, both male (OR=0.47) and female (OR=0.27) were less likely to have psychological problem than younger children. On the other hand, both male and female children who had incidence of physical illness in the past 2 weeks prior to the survey were more likely to have psychological problem (OR for male= 2.22, and for female=2.59). Presence of grandparents in the house plays a protective role for psychological problem among male children. However, presence of grandparents was not significant for female children. Male children who have grandparents in their house were less likely to have psychological problem (OR=0.39) than male children who did not have grandparents in their house. Both male and female children whose mother worked in the non-agricultural sectors were less likely to have psychological problem (OR for male=0.23, and for female=0.35)

compared with the male and female children whose mothers worked on agricultural/domestic sectors. It is found that older age of caregivers was a protective factor of psychological problem of male children. The odds of having psychological problem for male children whose caregivers were 30-39 years, and 40 years or above were 0.26 and 0.18 respectively. It is notable that psychological well-being of caregiver has an impact for both male and female children. Male and female children who were cared for psychologically unhealthy caregivers were 3 times, and 2.6 times respectively, more likely to have psychological problem than did children who were cared by psychologically healthy caregivers (Table 5.20).

Table 5.20 Odds ratios (OR) for having psychological problem among children by sex

Predictors	Male		Female	
	I	II	I	II
Parental migration status				
Parental migration (current)				
Non-migrant (ref.)	1.00	1.00	1.00	1.00
Migrant	1.56	2.82	1.64	0.48
Father's has ever moved since the child was born				
No (ref.)	1.00	1.00	1.00	1.00
Yes	0.75	0.98	0.69	0.97
Mother's has ever moved since the child was born				
No (ref.)	1.00	1.00	1.00	1.00
Yes	2.40*	1.65	2.45*	2.40*
Characteristic of children				
Age of children				
Younger child (ref.)		1.00		1.00
Older child		0.47*		0.27**
Parity of the children				
One (ref.)		1.00		1.00
Two		0.89		0.54
Three		0.72		0.40
Incidence of physical illness				
No (ref.)		1.00		1.00
Yes		2.22*		2.59**
Stunting				
No (ref.)		1.00		1.00
Yes		0.47		2.21
Overweight				
No (ref.)		1.00		1.00
Yes		1.54		1.68
Thin				
No (ref.)		1.00		1.00
Yes		1.18		0.58
Demographic and socio-economic conditions of HH				
Family size				
Up to 3 (ref.)		1.00		1.00
4-5 members		1.43		2.14
6 or more members		1.33		2.83
Sibling in the household				
No (ref.)		1.00		1.00
Yes		0.58		0.82

Table 5.20 Odds ratios (OR) for having psychological problem among children by sex (cont.)

Predictors	Male		Female	
	I	II	I	II
Grandparents in the household				
No (ref.)		1.00		1.00
Yes		0.39*		0.88
Father's education level				
Below primary (ref.)		1.00		1.00
Primary		0.47		1.54
Secondary or above		0.63		2.77
Father's occupation status				
Agricultural/domestic (ref.)		1.00		1.00
Non-agricultural		1.36		2.54
Mother's education level				
Below primary (ref.)		1.00		1.00
Primary		1.29		0.39
Secondary or above		2.04		0.57
Mother's occupation status				
Agricultural/domestic (ref.)		1.00		1.00
Non-agricultural		0.23**		0.35*
Remittances in the past 6 months (in Baht)				
No remittances/no migrant (ref.)		1.00		1.00
Less than 60,000		0.76		1.62
60,000-120,000		0.46		4.45
More than 120,000		0.35		5.74
Annual household saving (in Baht)				
No saving (ref.)		1.00		1.00
Less than 20,000		0.89		0.80
20,000-40,000		1.31		0.65
More than 40,000		1.18		0.47
Household wealth status				
Poor (ref.)		1.00		1.00
Middle		1.08		1.05
Rich		0.96		0.97
Characteristics of caregivers				
Age				
Less than 30 years (ref.)		1.00		1.00
30-39 years		0.26**		1.01
40 years or above		0.18**		1.01

Table 5.20 Odds ratios (OR) for having psychological problem among children by sex (cont.)

Predictors	Male		Female	
	I	II	I	II
Types				
Biological parents (ref.)		1.00		1.00
Grandparents/other		2.28		0.33
Hours spent in caring for children				
Less than 6 hours (ref.)		1.00		1.00
6 hours and over		0.96		1.32
Psychological well-being				
Healthy (ref.)		1.00		1.00
Unhealthy		3.01**		2.61**
# of observation	515	515	512	512
Constant	*0.130****	*0.776*	0.123***	*0.071**
-2 Log likelihood	*398.1*	*313.5*	*374.1*	*289.6*
Cox and Snell R-square	*0.015*	*0.143*	*0.015*	*0.143*

*Note *** Significant at P<0.001, **=p<0.01, and *=p<0.05*

5.3.1.3 The impact of parental migration on the psychological well-being of children across age group of children

Table 5.21 presents multivariate models predicting child psychological problems according to younger and older age groups. The results show that parental current migration status and father migration history did not have significant association with psychological problem among younger and older children in both models. On the other hand, mother's migration history has a negative impact on psychological well-being for both age groups of children. When other variables have not been controlled and if the child's mother has migration history after s/he was born, the odds of having psychological problem was higher (OR=2.11 for younger, and OR=3.55 for older) than of those children whose mother did not have migration history. Negative impact of mothers' migration history remained significant even after controlled by other variables such as children, household, and caregivers characteristics. The impact of mother migration history can be seen higher among older children than younger children (OR=1.25 for younger children, and 4.44 for older children).

Furthermore, those children who had incidence of physical illness were more likely to have psychological problem (OR= 3.31 for younger, and OR=1.63 for older children) for both age groups. As in the previous analysis, father and mother's occupation has impact on younger children but not for older children. Furthermore, psychologically unhealthy caregivers are risk factors for having psychological problem for both younger and older children.

Table 5.21 Odds ratios (OR) for having psychological problem among children by age

Predictors	Younger		Older	
	I	II	I	II
Parental migration status				
Parental migration (current)				
Non-migrant (ref.)	1.00	1.00	1.00	1.00
Migrant	1.45	0.66	1.49	3.23
Father's has ever moved since the child was born				
No (ref.)	1.00	1.00	1.00	1.00
Yes	0.95	1.23	0.64	0.77
Mother's has ever moved since the child was born				
No (ref.)	1.00	1.00	1.00	1.00
Yes	2.11*	1.25*	3.55**	4.44**
Characteristic of children				
Sex of child				
Female (ref.)		1.00		1.00
Male		1.06		1.49
Parity of the children				
One (ref.)		1.00		1.00
Two		0.55		1.02
Three		0.43		0.95
Incidence of physical illness				
No (ref.)		1.00		1.00
Yes		3.31***		1.63*
Stunting				
No (ref.)		1.00		1.00
Yes		1.37		0.32
Overweight				
No (ref.)		1.00		1.00
Yes		1.03		1.85
Thin				
No (ref.)		1.00		1.00
Yes		0.87		0.71
Demographic and socio-economic conditions of HH				
Family size				
Up to 3 (ref.)		1.00		1.00
4-5 members		1.87		1.86
6 or more members		1.91		3.69

Table 5.21 Odds ratios (OR) for having psychological problem among children by age (cont.)

Predictors	Younger		Older	
	I	II	I	II
Sibling in the household				
No (ref.)		1.00		1.00
Yes		0.63		0.75
Grandparents in the household				
No (ref.)		1.00		1.00
Yes		0.70		0.35
Father's education level				
Below primary (ref.)		1.00		1.00
Primary		0.99		0.45
Secondary or above		1.50		0.86
Father's occupation status				
Agricultural/domestic (ref.)		1.00		1.00
Non-agricultural		2.28**		0.35
Mother's education level				
Below primary (ref.)		1.00		1.00
Primary		0.73		0.85
Secondary or above		0.88		1.54
Mother's occupation status				
Agricultural/domestic (ref.)		1.00		1.00
Non-agricultural		0.18**		0.35
Remittances in the past 6 months (in Baht)				
No remittance/no migrant (ref.)		1.00		1.00
Less than 60,000		1.18		1.00
60,000-120,000		2.23		0.67
More than 120,000		3.50		0.32
Annual household saving (in Baht)				
No saving (ref.)		1.00		1.00
Less than 20,000		0.58		1.42
20,000-40,000		0.60		1.81
More than 40,000		0.80		1.63
Household wealth status				
Poor (ref.)		1.00		1.00
Middle		1.50		0.81
Rich		1.33		0.96
Characteristics of caregivers				
Age				
Less than 30 years (ref.)		1.00		1.00
30-39 years		0.70		0.36
40 years or above		0.37		0.38

Table 5.21 Odds ratios (OR) for having psychological problem among children by age (cont.)

Predictors	Younger		Older	
	I	II	I	II
Types				
Biological parents (ref.)		1.00		1.00
Grandparents/other		1.35		0.39
Hours spent in caring for children				
Less than 6 hours (ref.)		1.00		1.00
6 hours and over		0.88		1.53
Psychological well-being				
Healthy (ref.)		1.00		1.00
Unhealthy		2.52**		2.90**
# of observation	508	508	519	519
Constant	*0.173****	*0.149**	*0.071*	*0.074**
-2 Log likelihood	*475.7*	*378.9*	*267.0*	*221.1*
Cox and Snell R-square	*0.015*	*0.155*	*0.019*	*0.093*

*Note *** Significant at P<0.001, **=p<0.01, and *=p<0.05*

5.3.1.4 The impact of parental migration on the psychological well-being of children across household wealth

Table 5.22 presents odds ratio for having psychological problem among children by household wealth. Separate logistic regression was run for poor, middle class, and rich wealth households. Furthermore, two logistic regressions were run in each poor, middle class, and rich wealth households. It is found that as in the previous analysis, parental current migration, and father migration history did not have significant association on psychological well-being of children in all (poor, middle and rich) households and in both models; i.e. without controlling other variables, and controlling other variables. The impact of mother's migration on psychological well-being of children was found among children of middle class wealth status of household. Children who have migration history and living in middle-wealth households were more likely to have psychological problem (OR=5.8) compared with those children whose mother did not have migration history after controlling for other variables. It is also found that children of mother who had migration history and who resided in rich household were more likely to have psychological problem (OR=13.9) than those children who lived in rich household but their mother did not have a migration history. However, the result indicates that parental migration was not a significant risk factor among children of rich households once children characteristics, household characteristics, and caregivers' characteristics were controlled for. Thus differences in psychological problem between children from migrant parents and non-migrants parents of rich households was largely explained by the children characteristic, household characteristics, and caregivers characteristics in our model (Table 5.22).

As in other previous models, age of children, and psychological well-being of caregivers are significant predictors for psychological well-being of children of all households. Furthermore, higher parity seems to be a protective factor of psychological problem among children in poorer households.

Table 5.22 Odds ratios (OR) for having psychological problem among children by household wealth

Predictors	Poor		Middle		Rich	
	I	II	I	II	I	II
Parental migration status						
Parental migration (current)						
Non-migrant (ref.)	1.00	1.00	1.00	1.00	1.00	1.00
Migrant	1.93	3.71	1.44	1.39	1.30	0.54
Father's has ever moved since the child was born						
No (ref.)	1.00	1.00	1.00	1.00	1.00	1.00
Yes	0.68	0.85	0.88	0.85	0.53	2.60
Mother's has ever moved since the child was born						
No (ref.)	1.00	1.00	1.00	1.00	1.00	1.00
Yes	0.99	0.65	3.16**	5.82**	13.9***	2.46
Characteristic of children						
Age of children						
Younger child (ref.)		1.00		1.00		1.00
Older child		0.40*		0.41*		0.07*
Sex of child						
Female (ref.)		1.00		1.00		1.00
Male		1.22		1.33		0.89
Parity of the children						
One (ref.)		1.00		1.00		1.00
Two		0.31*		1.28		0.82
Three		0.26*		1.08		0.28
Incidence of physical illness						
No (ref.)		1.00		1.00		1.00
Yes		5.13***		2.44*		1.05
Stunting						
No (ref.)		1.00		1.00		1.00
Yes		0.48		1.82		1.93
Overweight						
No (ref.)		1.00		1.00		1.00
Yes		2.69		1.31		0.82
Thin						
No (ref.)		1.00		1.00		1.00
Yes		1.18		1.01		0.00
Demographic and socio-economic conditions of HH						
Family size						
Up to 3 (ref.)		1.00		1.00		1.00
4-5 members		1.80		0.79		1.30
6 or more members		7.33		1.13		30.2

Table 5.22 Odds ratios (OR) for having psychological problem among children by household wealth (cont.)

Predictors	Poor		Middle		Rich	
	I	II	I	II	I	II
Sibling in the household						
No (ref.)		1.00		1.00		1.00
Yes		1.01		0.84		0.04*
Grandparents in the household						
No (ref.)		1.00		1.00		1.00
Yes		0.69		0.87		0.12
Father's education level						
Below primary (ref.)		1.00		1.00		1.00
Primary		0.24		0.81		2.21
Secondary or above		2.55		0.57		0.77
Father's occupation status						
Agricultural/domestic (ref.)		1.00		1.00		1.00
Non-agricultural		1.75		1.19		3.19
Mother's education level						
Below primary (ref.)		1.00		1.00		1.00
Primary		0.94		1.16		0.39
Secondary or above		0.00		2.43		1.35
Mother's occupation status						
Agricultural/domestic (ref.)		1.00		1.00		1.00
Non-agricultural		0.52		0.19		0.13
Remittances in the past 6 months (in Baht)						
No remittances/no migrant (ref.)		1.00		1.00		1.00
Less than 60,000		0.76		1.65		0.89
60,000-120,000		0.99		1.41		3.23
More than 120,000		1.34		0.76		7.74
Annual household saving (in Baht)						
No saving (ref.)		1.00		1.00		1.00
Less than 20,000		1.27		0.64		9.93
20,000-40,000		0.69		1.28		8.56
More than 40,000		0.27		1.48		5.03
Characteristics of caregivers						
Age						
Less than 30 years (ref.)		1.00		1.00		1.00
30-39 years		1.53		0.35		1.76
40 years or above		0.97		0.27		1.01
Types						
Biological parents (ref.)		1.00		1.00		1.00
Grandparents/other		0.18		1.01		3.5
Hours spent in caring for children						
Less than 6 hours (ref.)		1.00		1.00		1.00
6 hours and over		1.86		1.02		0.44

Table 5.22 Odds ratios (OR) for having psychological problem among children by household wealth (cont.)

Predictors	Poor		Middle		Rich	
	I	II	I	II	I	II
Psychological well-being						
Healthy (ref.)		1.00		1.00		1.00
Unhealthy		2.45*		2.44*		20.6**
# of observation	405	405	417	417	205	205
Constant	*0.157*	*0.033***	*0.316***	*0.171*	*0.108****	*0.082*
-2 Log likelihood	*329.7*	*242.3*	*306.6*	*230.9*	*121.2*	*70.1*
Cox and Snell R-square	*0.007*	*0.184*	*0.026*	*0.172*	*0.067*	*0.243*

*Note *** Significant at P<0.001, **=p<0.01, and *=p<0.05*

5.3.2 Physical health of children

5.3.2.1 Incidence of illness

5.3.2.1.1 The impact of parental migration on children's illness

As presented above in the analysis of psychological well-being section, four logistic models were used to assess the net effect of independent variables on the dependent variable. The first model included parental migration related variables such as parental currently migration status, history of father, and mother migration. None of the variables in the first model had statistically significant association with children's illness.

Variables related to children's characteristics such as age, sex, parity of children, psychological well-being, and nutritional status (stunting, overweight, and thinness) were added in the second model. In this model, two individual-level characteristics such as 'age of children', and 'children's psychological well-being' had statistically significant association with physical health of children.

Demographic and socio-economic conditions of household were added in the third model. Both individual level variables which were significant in the second model retained their significance level after adding demographic and socio-economic conditions of household. In this model, none of the variables related to demographic

and socioeconomic conditions of the household had significant association with current physical illness of children.

Characteristics of the caregivers were added in the last model (fourth model). When the characteristics of the caregivers were added, two individual level variables (age of children, and psychological well-being of children) retained their significance level. Furthermore, in this model, ‘psychological well-being of caregivers’ was statistically significant with children’s illness.

In the last model, three variables; ‘age of children’, ‘psychological well-being of children’, and ‘psychological well-being of caregivers’, had significant association with children’s illness. Older children were less likely to have an illness (OR=0.69) than younger children. On the other hand, those children who had poor psychological well-being, were also about 2 times more likely (OR=2.28) to have illness than those who were psychologically healthy children. Furthermore, children who were cared for by the psychologically unhealthy caregivers were more likely (OR=2.09) to have an illness than those who were cared for by psychologically healthy caregivers.

Table 5.23 Odds ratios (OR) for having illness among children

Predictors	Models			
	I	II	III	IV
Parental migration status				
Parental migration (current)				
Non-migrant (ref.)	1.00	1.00	1.00	1.00
Migrant	0.94	0.86	1.09	1.09
Father's has ever moved since the child was born				
No (ref.)	1.00	1.00	1.00	1.00
Yes	0.92	0.99	1.12	1.08
Mother's has ever moved since the child was born				
No (ref.)	1.00	1.00	1.00	1.00
Yes	0.78	0.68	0.68	0.67
Children characteristics				
Age of children				
Younger child (ref.)		1.00	1.00	1.00
Older child		0.73*	0.68**	0.69*
Sex of child				
Female (ref.)		1.00	1.00	1.00
Male		0.99	1.00	1.01
Parity of the children				
One (ref.)		1.00	1.00	1.00
Two		0.80	0.89	0.89
Three		0.75	0.82	0.84
Psychological well-being				
Normal/borderline (ref.)		1.00	1.00	1.00
Abnormal		2.59***	2.58***	2.28***
Stunting				
No (ref.)		1.00	1.00	1.00
Yes		0.96	0.95	0.94
Overweight				
No (ref.)		1.00	1.00	1.00
Yes		0.99	0.93	0.90
Thin				
No (ref.)		1.00	1.00	1.00
Yes		1.48	1.55	1.51
Demographic and socio-economic conditions of HH				
Family size				
Up to 3 members (ref.)			1.00	1.00
4-5 members			0.75	0.75
6 or more members			0.82	0.81

Table 5.23 Odds ratios (OR) for having illness among children (cont.)

Predictors	Models			
	I	II	III	IV
Sibling in the household				
No (ref.)			1.00	1.00
Yes			0.75	0.74
Grandparents in the household				
No (ref.)			1.00	1.00
Yes			1.12	1.15
Father's education level				
Below primary (ref.)			1.00	1.00
Primary			0.87	0.86
Secondary or above			0.90	0.84
Father's occupation status				
Agricultural/domestic (ref.)			1.00	1.00
Non-agricultural			1.11	1.11
Mother's education level				
Below primary (ref.)			1.00	1.00
Primary			0.60	0.62
Secondary or above			0.64	0.67
Mother's occupation status				
Agricultural/domestic (ref.)			1.00	1.00
Non-agricultural			1.41	1.38
Remittances in the past 6 months (in Baht)				
No remittances/no migrant (ref.)			1.00	1.00
Less than 60,000			0.85	0.84
60,000-120,000			0.70	0.69
More than 120,000			0.61	0.61
Annual household saving (in Baht)				
No saving (ref.)			1.00	1.00
Less than 20,000			0.76	0.76
20,000-40,000			0.77	0.80
More than 40,000			0.90	0.96
Household wealth status				
Poor (ref.)			1.00	1.00
Middle			0.85	0.89
Rich			0.86	0.93
Characteristics of caregivers				
Age				
Less than 30 years (ref.)				1.00
30-39 years				0.99
40 years or more				0.91

Table 5.23 Odds ratios (OR) for having illness among children (cont.)

Predictors	Models			
	I	II	III	IV
Types				
Biological parents (ref.)				1.00
Grandparents/other				1.02
Hours spent in caring for children				
Less than 6 hours (ref.)				1.00
6 hours and over				1.17
Psychological well-being				
Healthy (ref.)				1.00
Unhealthy				2.09***
Constant	*1.28*	*1.48**	*5.10****	*3.41***
-2 Log likelihood	*1416.8*	*1347.9*	*1321.8*	*1302.2*
Cox and Snell R-square	*0.003*	*0.039*	*0.064*	*0. 082*

*Note *** Significant at P<0.001, **=p<0.01, and *=p<0.05*

As mentioned earlier in the psychological well-being section, the effects of duration of parental migration, and communication with migrant parents on children's illness were examined separately. It is found that none of these variables had significant association with children's illness with or without controlling for the variables such as children characteristics, demographic and socio-economic condition of household, and caregivers characteristics (Table 5.24).

Table 5.24 Odds ratios (OR) for the effect of duration of parental migration and communication with migrant parents on illness of children

Predictors	Models			
	I	II	III	IV
Total duration of father's migration since the child was born				
Non-migrant (ref.)	1.00	1.00	1.00	1.00
Less than 1 year	0.91	0.91	0.99	0.87
1-2 years	1.19	1.23	1.37	1.36
3 or more years	0.74	0.86	0.99	0.96
Total duration of mother's migration since the child was born				
No (ref.)	1.00	1.00	1.00	1.00
Less than 1 year	0.73	0.61	0.61	0.61
1-2 years	1.11	0.99	1.03	0.99
3 or more years	0.60	0.52	0.50	0.53
Communication with migrant parents				
Non-migrant	0.93	1.02	0.81	0.82
Less than once a week	0.81	0.83	0.86	0.79
Weekly	0.91	0.87	0.72	0.84
Daily (ref.)	1.00	1.00	1.00	1.00
Constant	*1.37*	*1.42*	*4.94***	*4.10**
-2 Log likelihood	*1405.2*	*1340.6*	*1314.7*	*1294.7*
Cox and Snell R-square	*0.014*	*0.044*	*0.071*	*0.089*

Note: Model 1 fitted without controlling any variable; Model 2 was fitted after controlling children characteristics (age of children, sex, parity, incidence of illness, stunting, overweight and thinness). Model 3 controlled all the variables which were controlled in model 2 and socio-economic conditions of household (family size, having sibling, having grandparents, father and mother's education and occupation, remittance, annual household saving and wealth); model 4 was fitted after controlling all variables those controlled in model 3 and characteristics of caregivers (age of caregiver, types of caregiver, hours spend in caring for children, and psychological well-being of caregiver).

5.3.2.1.2 The impact of parental migration across sex of children on incidence of children's illness

Table 5.25 presents multivariate models predicting illness among male and female children. No significant difference was found for having illness between children living with both parents and children living in transnational households. Similarly, no significant differences were also observed among male and female children for having illness between children having with father or mother migration history or not.

As in previous analysis, older children, both male and female older were less likely to have an illness than younger children. Similarly, both male and female children who have psychological problem were more likely to have an illness compared with those who did not have psychological problem (normal psychological well-being). Similarly, both male and female children who were cared by psychologically unhealthy caregivers were more likely to have an illness than were children who were cared by psychologically healthy caregivers (Table 5.25).

Table 5.25 Odds ratios (OR) for having an illness among children by sex

Predictors	Male		Female	
	I	II	I	II
Parental migration status				
Parental migration (current)				
Non-migrant (ref.)	1.00	1.00	1.00	1.00
Migrant	1.11	1.11	0.82	1.59
Father's has ever moved since the child was born				
No (ref.)	1.00	1.00	1.00	1.00
Yes	0.82	0.85	1.00	1.25
Mother's has ever moved since the child was born				
No (ref.)	1.00	1.00	1.00	1.00
Yes	0.64	0.57	0.95	0.79
Characteristic of children				
Age of children				
Younger child (ref.)		1.00		1.00
Older child		0.79*		0.59*
Parity of the children				
One (ref.)		1.00		1.00
Two		0.96		0.76
Three		0.69		1.30
Psychological well-being				
Normal (ref.)		1.00		1.00
Abnormal		2.10*		2.39*
Stunting				
No (ref.)		1.00		1.00
Yes		0.97		0.84
Overweight				
No (ref.)		1.00		1.00
Yes		0.96		0.92
Thin				
No (ref.)		1.00		1.00
Yes		1.06		1.26
Demographic and socio-economic conditions of HH				
Family size				
Up to 3 (ref.)		1.00		1.00
4-5 members		0.68		0.77
6 or more members		0.56		1.01
Sibling in the household				
No (ref.)		1.00		1.00
Yes		0.81		0.72

Table 5.25 Odds ratios (OR) for having an illness among children by sex (cont.)

Predictors	Male		Female	
	I	II	I	II
Grandparents in the household				
No (ref.)		1.00		1.00
Yes		1.22		1.01
Father's education level				
Below primary (ref.)		1.00		1.00
Primary		0.81		0.81
Secondary or above		0.88		0.69
Father's occupation status				
Agricultural/domestic (ref.)		1.00		1.00
Non-agricultural		0.87		1.39
Mother's education level				
Below primary (ref.)		1.00		1.00
Primary		0.77		0.63
Secondary or above		1.05		0.55
Mother's occupation status				
Agricultural/domestic (ref.)		1.00		1.00
Non-agricultural		1.18		0.86
Remittances in the past 6 months (in Baht)				
No remittances/no migrant (ref.)		1.00		1.00
Less than 60,000		1.45		0.44
60,000-120,000		0.77		0.42
More than 120,000		0.72		0.35
Annual household saving (in Baht)				
No saving (ref.)		1.00		1.00
Less than 20,000		0.79		0.79
20,000-40,000		0.62		1.13
More than 40,000		0.78		1.25
Household wealth status				
Poor (ref.)		1.00		1.00
Middle		0.91		0.85
Rich		1.14		0.78
Characteristics of caregivers				
Age				
Less than 30 years (ref.)		1.00		1.00
30-39 years		0.98		0.94
40 years or above		0.77		1.04
Types				
Biological parents (ref.)		1.00		1.00
Grandparents/other		1.24		0.89

Table 5.25 Odds ratios (OR) for having an illness among children by sex (cont.)

Predictors	Male		Female	
	I	II	I	II
Hours spent in caring for children				
Less than 6 hours (ref.)		1.00		1.00
6 hours and over		1.04		1.36
Psychological well-being				
Healthy (ref.)		1.00		1.00
Unhealthy		2.57***		1.60*
# of observation	515	515	512	512
Constant	*1.281*	*3.23**	*1.26*	*3.85**
-2 Log likelihood	*708.4*	*635.3*	*706.4*	*636.6*
Cox and Snell R-square	*0.007*	*0.113*	*0.003*	*0.106*

*Note *** Significant at P<0.001, **=p<0.01, and *=p<0.05*

5.3.2.1.3 The impact of parental migration across age group of children on incidence of children's illness

Result from the logistic regression analysis predicting illness among younger and older children is shown in table 5.26. None of the migration related variables have a significant effect on the probability of having illness among younger and older children.

Furthermore, both younger and older children who have abnormal psychological status were more likely to have illness than those who have normal psychological status. Similarly, both younger and older children who were cared by psychologically unhealthy caregivers were more likely to have illness than children who were cared by psychologically healthy caregivers (Table 5.26).

Table 5.26 Odds ratios (OR) for having an illness among children by age

Predictors	Younger		Older	
	I	II	I	II
Parental migration status				
Parental migration (current)				
Non-migrant (ref.)	1.00	1.00	1.00	1.00
Migrant	0.79	0.77	0.99	1.25
Father's has ever moved since the child was born				
No (ref.)	1.00	1.00	1.00	1.00
Yes	0.94	1.04	1.08	1.26
Mother's has ever moved since the child was born				
No (ref.)	1.00	1.00	1.00	1.00
Yes	1.07	0.82	0.60	0.49
Characteristic of children				
Sex of child				
Female (ref.)		1.00		1.00
Male		0.81		1.18
Parity of the children				
One (ref.)		1.00		1.00
Two		0.69		1.12
Three		0.78		0.73
Psychological well-being				
Normal (ref.)		1.00		1.00
Abnormal		2.98***		1.59*
Stunting				
No (ref.)		1.00		1.00
Yes		0.79		1.16
Overweight				
No (ref.)		1.00		1.00
Yes		0.87		1.03
Thin				
No (ref.)		1.00		1.00
Yes		1.08		1.07
Demographic and socio-economic conditions of HH				
Family size				
Up to 3 (ref.)		1.00		1.00
4-5 members		1.08		0.55
6 or more members		1.07		0.67

Table 5.26 Odds ratios (OR) for having an illness among children by age (cont.)

Predictors	Younger		Older	
	I	II	I	II
Sibling in the household				
No (ref.)		1.00		1.00
Yes		0.69		0.81
Grandparents in the household				
No (ref.)		1.00		1.00
Yes		0.82		1.43
Father's education level				
Below primary (ref.)		1.00		1.00
Primary		1.01		0.81
Secondary or above		0.81		1.23
Father's occupation status				
Agricultural/domestic (ref.)		1.00		1.00
Non-agricultural		0.78		1.47
Mother's education level				
Below primary (ref.)		1.00		1.00
Primary		0.39		0.72
Secondary or above		0.32		1.23
Mother's occupation status				
Agricultural/domestic (ref.)		1.00		1.00
Non-agricultural		2.20		1.02
Remittances in the past 6 months (in Baht)				
No remittances/no migrant (ref.)		1.00		1.00
Less than 60,000		0.72		1.03
60,000-120,000		0.89		0.59
More than 120,000		0.79		0.54
Annual household saving (in Baht)				
No saving (ref.)		1.00		1.00
Less than 20,000		0.75		0.81
20,000-40,000		0.73		0.87
More than 40,000		1.11		0.77
Household wealth status				
Poor (ref.)		1.00		1.00
Middle		1.08		0.72
Rich		1.10		0.74
Characteristics of caregivers				
Age				
Less than 30 years (ref.)		1.00		1.00
30-39 years		1.07		0.74
40 years or above		1.19		0.66

Table 5.26 Odds ratios (OR) for having an illness among children by age (cont.)

Predictors	Younger		Older	
	I	II	I	II
Types				
Biological parents (ref.)		1.00		1.00
Grandparents/other		0.89		0.93
Hours spent in caring for children				
Less than 6 hours (ref.)		1.00		1.00
6 hours and over		1.42		0.88
Psychological well-being				
Healthy (ref.)		1.00		1.00
Unhealthy		2.78**		1.78*
# of observation	508	508	519	519
Constant	*1.62***	*4.64**	*0.93*	*2.43*
-2 Log likelihood	*688.5*	*601.3*	*715.1*	*667.6*
Cox and Snell R-square	*0.005*	*0.124*	*0.007*	*0.082*

*Note *** Significant at P<0.001, **=p<0.01, and *=p<0.05*

5.3.2.1.4 The impact of parental migration across households wealth on incidence of children's illness

Table 5.27 presents odds ratio showing the effect of parental migration and other characteristics on illness among children from poor, middle, and rich wealth household. In the first model of each of the poor, middle, and rich wealth household, parental migration related variables were used as independent variables, and illness as dependent variable. None of the parental migration related variables were significant for having incidence of illness among children from poor, middle , and rich household without controlling for other variables (model I) and controlling for other variables (model II) too. It indicates that there are no significant differences between children of migrant parents and non-migrants parents for having an illness among poor, middle, and rich wealth households.

Furthermore, older children from all households (poor, middle, and rich) were less likely to have an illness than their comparison group. Similarly, irrespective of the household wealth status, children who have psychological problem were more likely to have an illness. Notably, children from poor and middle class wealth household who were cared by psychologically unhealthy caregivers were more likely to have an illness than their comparison group (Table 5.27).

Table 5.27 Odds ratios (OR) for having incidence of children's illness by household wealth

Predictors	Poor		Middle		Rich	
	I	II	I	II	I	II
Parental migration status						
Parental migration (current)						
Non-migrant (ref.)	1.00	1.00	1.00	1.00	1.00	1.00
Migrant	0.91	0.59	0.95	1.89	1.00	0.86
Father's has ever moved since the child was born						
No (ref.)	1.00	1.00	1.00	1.00	1.00	1.00
Yes	0.86	0.95	1.28	1.87	0.61	0.67
Mother's has ever moved since the child was born						
No (ref.)	1.00	1.00	1.00	1.00	1.00	1.00
Yes	1.01	1.13	0.56	0.48	0.96	0.44
Characteristic of children						
Age of children						
Younger child (ref.)		1.00		1.00		1.00
Older child		0.72*		0.56*		0.75*
Sex of child						
Female (ref.)		1.00		1.00		1.00
Male		0.85		0.93		1.34
Parity of the children						
One (ref.)		1.00		1.00		1.00
Two		1.18		0.89		0.38
Three		1.11		0.74		0.46
Psychological well-being						
Normal (ref.)		1.00		1.00		1.00
Abnormal		4.26***		2.16*		1.88*
Stunting						
No (ref.)		1.00		1.00		1.00
Yes		0.87		0.60		4.11
Overweight						
No (ref.)		1.00		1.00		1.00
Yes		0.55		0.99		0.95
Thin						
No (ref.)		1.00		1.00		1.00
Yes		1.25		1.26		0.39

Table 5.27 Odds ratios (OR) for having incidence of children's illness by household wealth (cont.)

Predictors	Poor		Middle		Rich	
	I	II	I	II	I	II
Demographic and socio-economic conditions of HH						
Family size						
Up to 3 (ref.)		1.00		1.00		1.00
4-5 members		0.79		0.46		0.90
6 or more members		1.13		0.51		0.49
Sibling in the household						
No (ref.)		1.00		1.00		1.00
Yes		0.43		1.01		1.05
Grandparents in the household						
No (ref.)		1.00		1.00		1.00
Yes		0.80		1.33		1.92
Father's education level						
Below primary (ref.)		1.00		1.00		1.00
Primary		1.29		0.85		0.55
Secondary or above		0.39		0.63		0.76
Father's occupation status						
Agricultural/domestic (ref.)		1.00		1.00		1.00
Non-agricultural		0.83		1.73		0.65
Mother's education level						
Below primary (ref.)		1.00		1.00		1.00
Primary		0.47		0.42		1.58
Secondary or above		2.01		0.49		1.35
Mother's occupation status						
Agricultural/domestic (ref.)		1.00		1.00		1.00
Non-agricultural		1.08		1.24		2.11
Remittances in the past 6 months (in Baht)						
No remittances/no migrant (ref.)		1.00		1.00		1.00
Less than 60,000		1.51		0.48		0.61
60,000-120,000		1.44		0.24		1.24
More than 120,000		0.95		0.29		1.22
Annual household saving (in Baht)						
No saving (ref.)		1.00		1.00		1.00
Less than 20,000		0.51		0.83		1.25
20,000-40,000		0.79		0.89		0.75
More than 40,000		1.09		0.92		0.77

Table 5.27 Odds ratios (OR) for having incidence of children's illness by household wealth (cont.)

Predictors	Poor		Middle		Rich	
	I	II	I	II	I	II
Characteristics of caregivers						
Age						
Less than 30 years (ref.)		1.00		1.00		1.00
30-39 years		0.82		1.37		0.66
40 years or above		1.14		0.97		0.54
Types						
Biological parents (ref.)		1.00		1.00		1.00
Grandparents/other		1.39		0.63		2.39
Hours spent in caring for children						
Less than 6 hours (ref.)		1.00		1.00		1.00
6 hours and over		0.93		1.30		1.83
Psychological well-being						
Healthy (ref.)		1.00		1.00		1.00
Unhealthy		2.26**		2.56**		1.09
# of observation	405	405	417	417	205	205
Constant	*1.358*	*5.55**	*0.97*	*3.21*	*1.65**	*2.98*
-2 Log likelihood	*557.9*	*477.12*	*573.7*	*516.3*	*279.5*	*233.5*
Cox and Snell R-square	*0.003*	*0.163*	*0.010*	*0.121*	*0.014*	*0.172*

*Note *** Significant at P<0.001, **=p<0.01, and *=p<0.05*

5.3.2.2 Nutritional status

Another way of examining the impacts of migration on the physical well-being of left-behind children is by looking at their anthropometric measurements. Under nutritional status, children were at an increased risk of physical and mental morbidity. CHAMPSEA project had collected information about anthropometric measurements including weight and height. The height and weight data were used to compute three summary indices (height-for-age; weight-for-height, and weight-for-age) of nutritional status in this study. Children whose height-for-age was below minus two standard deviations from the median of the reference population are considered stunted or short for their age. Children whose weight-for-height was below minus two standard deviations from the median of the reference population are considered wasted or thin. Children whose weight-for-age was more than two standard deviations from the median of the reference population are considered overweight.

Stunting is the outcome of failure to receive adequate nutrition over an extended period, and is also affected by recurrent or chronic illness. Thinness/wasting represents the failure to receive adequate nutrition in the period immediately before the survey, and typically is the result of recent illness episodes, especially diarrhea, or of a rapid deterioration in food supplies.

Nutritional status related variables such as stunting, overweight, and thinness were used separately as dependent variables in the analysis. Regarding stunting, parental migration does not show any significant association with stunting. Among many variables, in this study only one variable, wealth index has a significant association with stunting. Children from the rich households were less likely (OR=0.38) to be stunted than the children from poor households.

Regarding overweight, variables such as mother's migration history since a child was born, age of children, and wealth index were significant predictors for overweight. Children of those mother who had migration history since the child was born were more likely to be overweight (OR=2.59) than children of those mother who did not have migration history since the child was born. It is also found that older children (aged 9-11) were more likely to be overweight (OR=2.60) than younger child (aged 3-4). Household wealth has positive and significant association with overweight of children. Children from the middle and rich wealth households were about 2 and 3 times, respectively, more likely to be overweight than the children from poor family.

Regarding thinness, none of the studied variables in this study has significant association with thinness among children.

Table 5.28 Odds ratios (OR) for having stunting, overweight, and thinness among children

	Stunting	Overweight	Thin
Parental migration status			
Parental migration (current)			
Non-migrant (ref.)	1.00	1.00	1.00
Migrant	1.59	0.83	0.43
Father's has ever moved since the child was born			
No (ref.)	1.00	1.00	1.00
Yes	1.55	0.58	1.02
Mother's has ever moved since the child was born			
No (ref.)	1.00	1.00	1.00
Yes	0.43	2.59**	0.74
Children characteristics			
Age			
Younger child (ref.)	1.00	1.00	1.00
Older child	0.79	2.60***	1.11
Sex			
Female (ref.)	1.00	1.00	1.00
Male	1.05	1.30	0.88
Parity			
One (ref.)	1.00	1.00	1.00
Two	1.35	0.69	1.26
Three	1.38	0.41	2.28
Psychological well-being			
Good (normal/borderline) (ref.)	1.00	1.00	1.00
Poor (abnormal)	0.85	1.43	0.87
Incidence of physical illness			
No (ref.)	1.00	1.00	1.00
Yes	1.06	0.92	1.50
Demographic and socioeconomic conditions of HH			
Family size			
Up to 3 (ref.)	1.00	1.00	1.00
4-5	1.98	0.51	1.35
6 or more	2.01	0.56	0.59
Sibling in the household			
No (ref.)	1.00	1.00	1.00
Yes	0.84	1.12	1.01

Table 5.28 Odds ratios (OR) for having stunting, overweight, and thinness among children (cont.)

	Stunting	Overweight	Thin
Grandparents in the household			
No (ref.)	1.00	1.00	1.00
Yes	0.76	1.75	0.73
Father's education level			
Below primary (ref.)	1.00	1.00	1.00
Primary	0.77	1.06	1.44
Secondary or above	0.84	0.67	2.26
Father's occupation status			
Agricultural/domestic (ref.)	1.00	1.00	1.00
Non-agricultural	1.01	0.90	0.66
Mother's education level			
Below primary (ref.)	1.00	1.00	1.00
Primary	0.46	0.59	0.78
Secondary or above	2.53	0.36	1.39
Mother's occupation status			
Agricultural/domestic (ref.)	1.00	1.00	1.00
Non-agricultural	0.44	1.52	0.92
Remittances in the past 6 months (in Baht)			
No remittances/no migrant (ref.)	1.00	1.00	1.00
Less than 60,000	0.78	0.55	2.03
60,000-120,000	0.53	1.33	2.77
More than 120,000	0.65	1.24	2.00
Annual household saving (in Baht)			
No saving (ref.)	1.00	1.00	1.00
Less than 20,000	1.24	0.73	1.13
20,000-40,000	1.26	1.08	0.82
More than 40,000	1.50	0.89	1.02
Household wealth status			
Poor (ref.)	1.00	1.00	1.00
Middle	0.67	1.81*	0.98
Rich	0.38*	3.03**	0.68
Characteristics of caregivers			
Age			
Less than 30 years (ref.)	1.00	1.00	1.00
30-39 years	0.95	1.02	0.74
40 or more	0.88	1.15	0.56
Types			
Biological parents (ref.)	1.00	1.00	1.00
Grandparents/other	1.37	0.56	1.16

Table 5.28 Odds ratios (OR) for having stunting, overweight, and thinness among children (cont.)

	Stunting	Overweight	Thin
Hours spend in caring for children			
Less than 6 hours (ref.)	1.00	1.00	1.00
6 hours and over	0.86	0.85	0.94
Psychological well-being			
Healthy (ref.)	1.00	1.00	1.00
Unhealthy	1.12	1.32	1.18
# of observation	1,027	1,027	1,027
Constant	*0.15**	*0.13***	*0.08***
-2 Log likelihood	*529.4*	*704.1*	*544.7*
Cox and Snell R-square	*0.033*	*0.082*	*0.028*

*Note *** Significant at P<0.001, **=p<0.01, and *=p<0.05*

CHAPTER VI
DISCUSSION, CONCLUSION AND RECOMMENDATIONS

This chapter presents discussion and conclusion of impact of parental internal as well as international out migration on the health of children. The chapter also presents policy recommendation and recommendation for further research.

6.1 Parental internal out-migration and the impact on the physical health of children

The study finds that a substantial proportion of children in Kanchanaburi province were living separately from either one or both parents due to parental internal out migration. It was hypothesized that internal out migration of parents is negatively associated with health of children left behind compared to children living with both parents. This study supports the hypothesis that children whose parent(s) had migrated showed a higher risk of having an illness as compared with those whose parents did not migrate. There are several potential explanations for this. Households where parent(s) have migrated may have fewer family members and less time available to prepare nutritious, home-cooked meals, and to take care when the child is sick. Previous studies suggest that children of absent parents do not receive required care and medicine on time, and receive low quality food (Salah, 2008). The other reason could be that children of migrant parents have more illness due to inadequate supervision or under-protected situation. The findings of this study are similar to those from China (Shen et al., 2009), and Nairobi, Kenya (Konseiga et al., 2009) which found that children of absent parent(s) have more risk of injury and physical illness. However, the other important factors can mitigate the health problems of left-behind children including characteristics of the primary caregiver, which were not available in this survey.

It was also hypothesized that migration of mother is negatively associated with health of children (as measured by presence of illness) than children of migrant fathers, when compared to children living with both parents. When the data were analyzed by distinguishing whether mother or father migrate, our study supports the hypothesis that children from mother-only migrant households have higher odds of experiencing illness than other type of households. However, the effect of mother-only migrant household is only marginally significant ($p<0.1$). This may be explained by the fact that migration of mother alone is not common in the Thai context. Most of women migrate alone if their husband cannot earn enough or their husband's earning is not sufficient. Study also showed that mother living separately from her children is likely to work due to their economic necessity (Richter, 1996). It is possible that mother migrant households may be in a worse situation before the mothers migrate. Interestingly, our study showed no significant impact of having both migrant parents. It could be due to the fact that parents do not generally leave their children behind with a person whom they cannot entrust their children with. So, children of both-parent migrants may be those in good hands of non-parent carers, most likely the grandparents. The study also found that if the child is cared for by grandparents while the parent migrates, the child-care arrangement remains the same (Richter, 1996). Grandparents may know better in bringing up children so there is no significant negative impact on health of children of both migrant parents. It could also be a result of a reverse causality whereby both parents migrated because their children are healthier. The other reason could be that grandparents' underreporting due to their perception that they take better care of the children than the children's parents. It could also be that grandparents or older-generation people may not consider common illnesses as an illness, hence underreporting can occur. By contrast, in those households in which either the father or mother has migrated, it is likely that one of the parents is the respondent of the survey s/he may consider common illnesses as illness. This explanation needs further investigation, however.

When the data were analyzed to examine the impact of parental migration across sex of children, age of children, and household wealth, detailed and interesting information was found. The study finds negative impact of mother's migration on health of both male and female children. Similarly, negative impact of mother's

migration was found among children aged 0-4 but not among older children. However, negative impact of father's migration existed on the health of female children but not for male children. Furthermore, it is notable that migration of any type of parents either alone or both (mother-only, father-only, or migration of both parents) have negative impact on health among children of poor household.

Possible explanation of the strong effect of mother's migration on incidence of illness could be the lack of care because in most society, the mother is the primary caregiver for children. Negative impact of father migration on health of female children could be due to most of the society female children help mother more in household chores or outside than male children. These situations may increase the risk of transmitting or infection of communicable disease. This study found that mother's migration has more negative impact on health of children aged 0-4 years. Negative impacts of mother's migration among the 0-4 aged children are likely to be exposed to several factors that can increase their incidence of illness, including: reduction of care, cessation of breastfeeding or improper bottle feeding. This study also implies that mother's role is irreplaceable especially among young children as shown in another study (Jampaklay, 2006).

The strong negative impact of parental migration (mother-only migrant, father-only migrant, or both parents) on the health of poor children could be that poor people suffer from the lack of basic public facilities such as sanitation and water, and sanitation situation could be worst if children live without one or both parents. Even if children have one parent in their household, the left-behind parent usually works during the day time leaving the children with elder siblings or sometimes alone. Parents may not have time to sit with children and care for them properly due to poverty. The other reasons could be the caregivers of both-parent migrants of poor household may be also poor so they may not get nutrition food and timely care. The connection between wealth and food was particularly stark for those households that were dependent on daily wage earnings. Poor family members ate on a more ad hoc basis, sometimes postponing meals until the money had come in to buy food. In such case, if their parents move out, the situation becomes worse off as a result of their move.

The analysis also identified other major risk factors such as age, ethnicity, family size, household debt, sources of drinking water, and availability of bus route in the village associated with incidence of illness. Being in the youngest age group was a significant risk factor for having incidence of illness. This finding is likely to be related to biological factors because younger children are more prone to incidence of illness. The other reason could be that older children may be aware about sanitation or healthy food so they might adopt healthy behavior. This finding is consistent with what has been found in other studies (Gordon et al., 2009; Neuzil et al., 2000).

This study also found that children of Thai parents were more likely to have an incidence of illness than those children of non-Thai parents. When data analyzed according to wealth status of household, the negative impact on health among children of Thai parents existed only in poor household not in the children of middle class or rich wealth households. It means that children of poor Thai parents were more likely to have incidence of illness compared with children of poor non-Thai parents. Children of non-Thai parents could also be positively selective in-migration. Furthermore, in this study, only few non-Thai households were rich (wealth index calculated by household possession) compared to Thai households (<1% non-Thai compared with 24% Thai households). At the same time, significantly lower percentages of non-Thai have debt compared with Thai households. For instance, about a half of non-Thai households have debt while the figure is about four-fifths (79%) among Thai households (data not shown). These households which have higher debt may not have enough money to buy nutritious food or for good care for children. Another reason could be that the non-Thai parents did not identify the incidence or did not perceive the minor disease as health problems, so they did not report it as an illness. Another possible reason is non-Thai people have good network within their group so even parents need to work outside, their left-behind children can be cared for or monitored by other members than family too. However, this finding also requires further investigation.

Having more family members in the household seem to be a protecting factor for having incidence of illness among children. It could be that the child can play and share their feeling with many family members especially with siblings which may make them happy. Another reason could be that they may protect each other from

health risk environment. It is also possible that family member can help to take care of each other. Some studies have shown that having many children in a household has protective effects on the development of respiratory infections (via the "hygiene hypothesis") (Strachan 1989; Davé et al, 2008). Future research should investigate this association further, however.

The socio-economic status of the household is the strongest predictor of having incidence of illness among children. Unlike other many studies, this study finds that children of households which received some remittances from the migrant family members were more likely to have an illness than were children of those households which did not receive remittances in the past one year. Notably, when the data was analyzed according to household wealth, effect of remittances was observed in poor and medium households but not in rich household. The reason could be that children from these poor and medium households who received some remittances also may receive more pocket money. These children may eat food outside their home which may be unhygienic. Another possible reason is these households who received little amount of remittances (<10,000 baht) are also significantly higher in-debt (77%) compared to those who do not receive remittances (75%) or those who received medium (72%) or high remittances (67%). They may use the remittances to pay back the loan/debt incurred to facilitate migration or household expenses. It is also possible that remittances received by migration may be used for other members and not the children. It may also imply that low remittances do not help while high remittances may help to compensate negative impact. Furthermore, households having debt is also positively associated with poor physical health of children. These children may not get nutritious food. However, this finding requires further investigation.

Regarding the source of drinking water, children who drink water from shallow wells or an underground source were more likely to have an illness than those who drink water from the tap. This implies that water from shallow well and underground sources are more polluted than tap water, resulting in digestive disorders.

Interestingly, children from those villages where a bus route was available were less likely to have an illness than children from those villages where a bus route was not available. Having a bus route in the village may be a proxy for the level of village development. It could also indicate that migrant parents of children or relatives

of children can visit left-behind children frequently, which can increase the monitoring/supervision of the children. Another reason could be that places which have good access to bus routes can also have easy access to a hospital or health care services.

6.2 Parental international migration and the impact on the psychological well-being, and the physical health of children

This study, in using the Strength and Difficulties Questionnaire, opens a new frontier in the study of the impact of parental migration in Thailand on the psychological well-being of children left behind and finds that more than a tenth of children experienced psychological problems. Similarly, almost half of the children had experienced physical health problem within the past 2 weeks prior to the survey.

It was hypothesized that children living in transnational households have poorer physical and psychological well-being (as measured by presence of abnormal emotional and behavior symptoms) compared to children living with both parents. Our study did not support this hypothesis. This study did not find any significant association between current parental international migration status and psychological well-being or physical health status of children left behind. However, significant differences in terms of poor psychological well-being among children according to mother's migration history, age of children, physical health status of children, fathers' and mother's occupation status, age of caregivers, and caregiver's psychological well-being were found in the study. Similarly, this study finds significant differences in terms of incidence of physical illness among children according to age of children, psychological well-being of children, and caregiver's psychological well-being. Furthermore, this study also finds that nutritional status (overweight) was associated with mother's migration history, age of children, and household wealth status.

No significant differences between current parental international migration status and psychological well-being or physical health status of children left behind was found which can perhaps be attributed to better nutrition from the higher socio-economic status of migrant families as well as the quality of caregivers. The other reason could be because almost all the parents (94%) who migrated were the fathers,

not the mothers and probably children have received good care from their mothers. Similarly, it can also be due to the fact that the two study sites have the highest prevalence of overseas migration in Thailand. It is possible that in these settings, overseas migration is perceived as common, and thus negative impacts might not be recognized as much as in settings where overseas migration is less common.

This study notes that mother's migration history had a significant, independent association with psychological problems of children left behind. Those children whose mothers had migrated and had left them behind had higher psychological problem and physical health (overweight) problems than did children whose mothers did not migrate after they were born. When the data were analyzed across age, sex of children, and household wealth status of children, mother's migration history after the child was born has negative impact for both younger and older children. With regards to sex of children, mother's migration after the child was born had a negative impact on health of female children but not for male children. The study also found that the impact of mother's migration history after child was born was strong and statistically significant among children of middle class wealth status household. The reason of negative impact on psychological health of children with previous migration experience of the mother may be these children had problem with their previous caregiver. These children might not receive better care in the absence of their mother. It also shows that absence of parents may leave a long-term consequence on children.

Previous research also suggests that migration is not necessarily disruptive for the children left behind if it is not the mother who migrates (Battistella & Conaco, 1998). The children of migrant mothers were found to feel lonely, angry, unloved, afraid, and anxious compared with children of non-migrants (SMC, 2005). This is consistent with previous observation that a mother's love is often irreplaceable (Jampaklay, 2006). The reason for more negative impact of mother's migration experience on psychological health of female could be that female children are more attached with mothers than their fathers. Furthermore, it is not clear that why there is a negative impact of mother's migration after the child is born on psychological well-being of children of middle class wealth household but not among children of poorest and richest households.

The reason for overweight among children left behind by mothers since the child was born could be due to the fact that they were cared by other people and they received more food. The other possible reason could also be that when these migrant mothers returned they cared more for their children and thus fed them more. The study found that people eat more than usual when they are bored, angry or stressed (National Heart Lung and Blood Institute, 2010). These children may eat more than usual when they are bored, or stressed due to absence of mother which lead to weight gain and may cause overweight. Future research should investigate this association further, however.

Analysis revealed that other factors such as age of children, parental occupation, household wealth status, age and psychological well-being of caregiver are significantly associated with health of children. This study found that age of children had significant association with the children's physical and psychological well-being. Older children were less likely to have health problems (physical and psychological) than younger children, which could be due to decrease in dependency of older children. The other reason could be older children may have developed a better support network with their peers (Fan et al., 2010) that may help to reduce the risky healthy behavior. It could be as Asis (2006) suggested that children play a role in improving their own well-being by taking charge of their lives. Children who live separately from their migrant parents provide them space to grow independently upon the removal of restrictive parental control and may learn many important skills (Asis, 2006).

As expected, physical health and psychological well-being are associated. Those children who had physical health problems were also more likely to have psychological problems. And those children who suffered psychological problem also had physical health problems. Other studies support the finding that physical illness of children increased the risk of emotional and behavioral problems (Aarons et al., 2008; Hysing et al., 2007) and vice versa.

This study finds parental occupation (both father's and mother's occupation) is associated with psychological well-being of children. Children of fathers who worked in non-agricultural sectors have higher likelihood of having psychological problem than children of those fathers who worked in

agricultural/domestic sector. However, the study finds the opposite direction for mother's occupation. Children of those mothers who worked in non-agricultural sectors were less likely to have psychological problem than children of those mothers who worked in agricultural/domestic sector. It could be that the father who worked in non-agricultural sectors worked in poor setting such as daily laborers or construction sectors so they may earn little money. These fathers may not have time to be with their children and may not fulfill the need/desire of children as well. Mothers who are working in non-agricultural sector have work responsibility for only eight hours per day, so they can spend more time with their children than mothers who are farmers. Besides, they can send the child to a playgroup/day nursery when they are at work, while those who are farmers or workers usually let older children look after the younger ones. The other reason could be mothers who worked in non-agricultural sector may earn more money and fulfill the need of children. However, these findings require further investigation.

The present study found also that caregiver's characteristics had a significant impact on children's psychological well-being and physical health. Those children who were cared by older caregivers were less likely to have psychological problems than were those who were cared for by younger caregivers. This could be because younger caregivers tend to be busy with their work and lack sufficient time to provide adequate support and nurturance for children under their care (Fan & Sang, 2005).

Furthermore, children who were cared by psychologically healthy caregivers were less likely to have both psychological well-being and physical health problems than were children cared for by psychologically unhealthy caregivers. One reason could be that psychologically healthy caregivers provide better care and support. The other reason could be psychologically unhealthy caregivers may contribute to a stressful environment for children, which has in turn been associated with negative psychological consequences for these children. As in other Asian societies, mothers cared for most of the children. Research has found that depression and emotional problems among mothers were positively associated with children's anxiety-depression symptoms (Champion et al., 2009).

Household wealth status had an impact on stunting and weight of children. The odds of stunting were significantly lower in children of richest quintile compared with poorest quintile. On the other hand, the chance of overweight was higher among children of richest quintile than the poorest. The finding is similar to the study conducted among school children in Brazil (Guedes et al., 2011). The reason could be that children who were from poor household have fewer resources (Brooks & Duncan, 1997; Pinderhughes et al., 2000) so they may not get nutritious food. On the other hand, children of richest household may eat more food which makes them overweight compared with children from poor households. Unlike other many studies, this study did not find significant association between health of children left behind and remittances by international migration. However, it should not be concluded that remittances received by migrants' family members are not significantly related to health of children and thus we should not ignore the importance of remittances for the better life of children.

6.3 The impact of parental internal and international migration on health of children in the context of Thailand

Internal and international migration is a common phenomenon in Thailand, yet only few studies have been conducted to examine the impact of parental migration on children left behind. This study aims to contribute to our understanding of this experience by examining whether or not parental migration is associated with physical health, and psychological well-being of children.

The data for this study was obtained from two sources, the Child Health and Migrant Parents in South-East Asia (CHAMPSEA), 2008, and Migration and Health, Kanchanaburi Demographic Surveillance System (KDSS), 2007. The CHAMPSEA data dealt with parental international migration and its impact on children's psychological well-being and physical health status. Similarly, Migration and Health, KDSS data addressed the research questions regarding impact of parental internal out migration on physical health status of children left behind.

The research methodology (sampling design, definition of children, data collection techniques etc.) adopted in these two data sources was different. Similarly,

the measurements of physical health status of children and the duration for the incidence of physical illness of these two data sets are also different. So the findings of these two data sources are not comparable. However, the findings of these two separate data sets supplement each other to address different aspects of migration impacts (internal and international) on the health of children left behind.

Due to rapid urbanization and modernization, Bangkok and its surrounding areas have emerged as the major destination for migrants in the entire Greater Mekong Sub-region and for internal migrants from other provinces as well. Poverty is identified as one of the major causes for migration. Level of absolute poverty is estimated to be much higher in rural areas than urban areas. The other factor increasing rural-urban migration could be changes in the technological structure of agriculture resulting in reduction in the demand for agricultural labor. Skeldon (1997) argues that rural-urban migration is particularly beneficial as a means of alleviating poverty in rural areas.

In Thailand, males comprise the majority of migrants. However, due to demand for young female labors particularly in service sectors of urban areas, females dominate migration to urban areas, particularly in Bangkok (Pejaranonda et al., 1995). Study has found that many of the female migrants in Thailand are young, unmarried and moving in search of employment (Guest, 2003).

This study found that a higher percentage of males (father of children) migrated both internally as well as internationally compared to female (mother of children). Among the female migrants, a higher percentage of them migrated internally but very few were oversees migrants. Among the international out migrants, only 16% emigrants are female (Overseas Employment Administration Office, Ministry of Labor, 2007). However, this figure includes both unmarried and married female. Unlike countries such as Indonesia and the Philippines where transnational migration has been long established, overseas migration is a relatively recent phenomenon in Thailand. Furthermore, as in most countries, the married females in Thailand are also less likely to migrate internationally due to social and cultural obligations. In the CHAMPSEA study, very few females (three cases of mother-only migrant and 30 cases of mother accompanied with father) are migrants that indicate very few married women who have child/ren tend to migrate internationally.

This study finds that a substantial proportion of children in Kanchanaburi province were living separately from either one or both parents due to parental internal out migration. This study also finds that children whose parent(s) had migrated showed a higher risk of having an illness as compared with those whose parents did not migrate. When the data were analyzed by distinguishing gender of migrant parents, our study found that children from mother-only migrant households have higher odds of experiencing illness than other type of households. Similarly, a negative impact of mother's migration was found among children aged 0-4 but not among older aged children. Furthermore, the strong, negative impact of parental migration (all three types; i.e., mother-only migrant, father-only migrant, or both parents) on the health of children of poor households was found but not significant association among children of middle class and rich households. Notably, our study did not find any significant association between current parental international migration status and psychological well-being or physical health status of children left behind.

The reason to observe significant association between internal parental migration and children's health and non-significant association between international parental migration and children's health could be due to the contextual difference. As mentioned earlier, poor people usually do not migrate internationally, most of them are internal migrants. So those who cross the border are usually rich people in the place of origin compared with those who migrate internally to search for jobs. Our study found that parental migration has more negative impact on health of left behind children particularly in poor households. It could be due to lack of nutritious food and timely care due to absence of parent(s). In general, the education level of these poor parents is not high so most of them work in agriculture or construction field and earn little money. The remittances they send may be used for different purpose such as to pay back loan or other expenditures.

The other important factor that has an impact on health of children left behind varied with gender of migrant parents. In CHAMPSEA study, almost all oversees migrants are male i.e. father of children not mother. On the other hand, KDSS data shows mother-only or both-parents internal migrant are higher. This study showed that mother's migration has more negative impact on children's health. The

other study also found that migration need not necessarily be disruptive for the children left behind if it is not the mother who migrates (Battistella & Conaco, 1998).

Caregiver's health status is the other important issue that may have an impact on children's health. This study using the data from CHAMPSEA project found that those children who were cared for by psychologically healthy caregiver have better psychological and physical health as well than those who were cared for by psychologically unhealthy caregivers. However, information about the caregiver's psychological well-being was not collected in KDSS study.

In summary, when we compare the internal and international migration data, we should note that the contexts of internal and international migration are different. This study found that parental internal out migration has negative impact on physical health of children especially in poor households. However, parental current international migration did not show any significant impact on psychological well-being and physical health of children left behind. Notably, migration experience of mother does have a negative impact on children's psychological well-being.

6.4 Policy recommendations

1. Government should develop special programs to improve the quality health services focusing on left-behind children. This study finds that a substantial proportion of Thai children are living separately from either one or both parents due to parental internal migration. While migrant workers play an important role in improving the country's economy, left behind children faced negative consequences on health in the absence of their parent(s).

2. Government and non-governmental organizations should focus on poor household to uplift the living condition by increasing their income status. This study finds significant and higher negative impact of parental migration on health of children among poor household.

3. Design and advocate appropriate intervention discouraging to migrate to the mother who have small child, and create alternative opportunity

for income generation in the place of origin. This study finds that mother migration has more negative impact among children aged 0-4 than other children.

4. Government should design and implement the effective strategies to prevent mental and physical health problems among those children with mother migration history after a child is born. This study suggests that mother's past migration experience was a risk factor for current psychological well-being and physical health problems among children. This implies that mothers' past migration experience can actually leave long-lasting impacts on children's lives.

5. Governmental organization/ non-governmental organizations or child activists should provide awareness about negative impact of parental migration on health of children. Although this study did not cover whether or not these people know the negative consequences of parental migration, it would be better to make these people aware of this fact. It is also important to gain a deeper understanding of the relationship between parental migration and health of children to minimize the negative effects.

6.5 Recommendations for further research

1. Future research should consider examining the health of children before and after parents migrate.

2. Longitudinal study focusing on impact of parental migration on health of children should capture more detail information about the impact of parental migration on health of children left behind.

3. Future study on impact of parental migration on children should include migrant parents' perspective to be more informative and useful.

4. A qualitative study is recommended to capture more detail on unexpected observed relation of remittances with health of children.

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